

C. VALLONE & F. R. ROGERS.  
DIP PAINTING MACHINE.  
APPLICATION FILED OCT. 7, 1909.

980,030.

Patented Dec. 27, 1910.

3 SHEETS—SHEET 1.

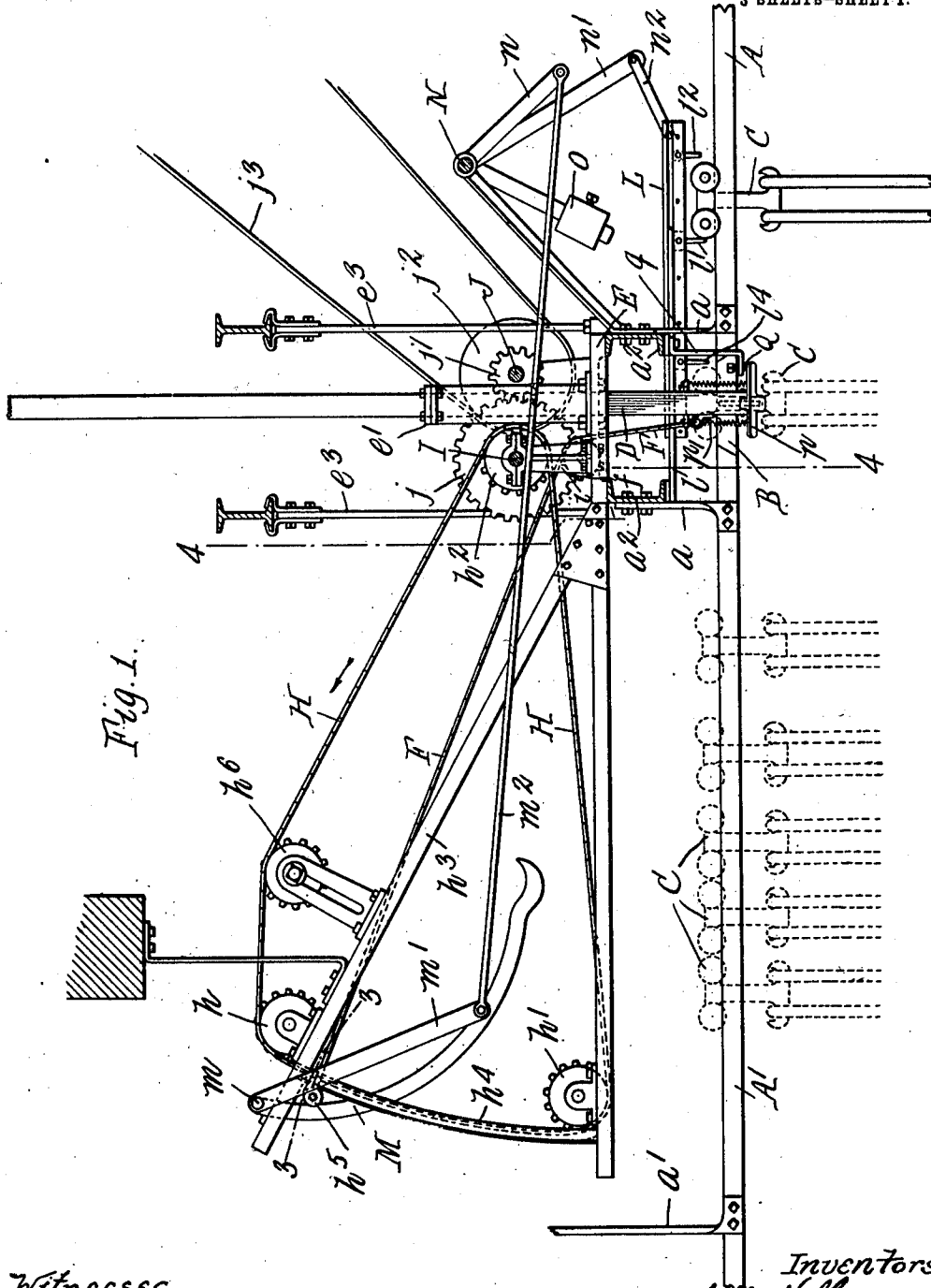


Fig. 1.

Witnesses.

A. G. Demond.  
C. H. Bund

Inventors.

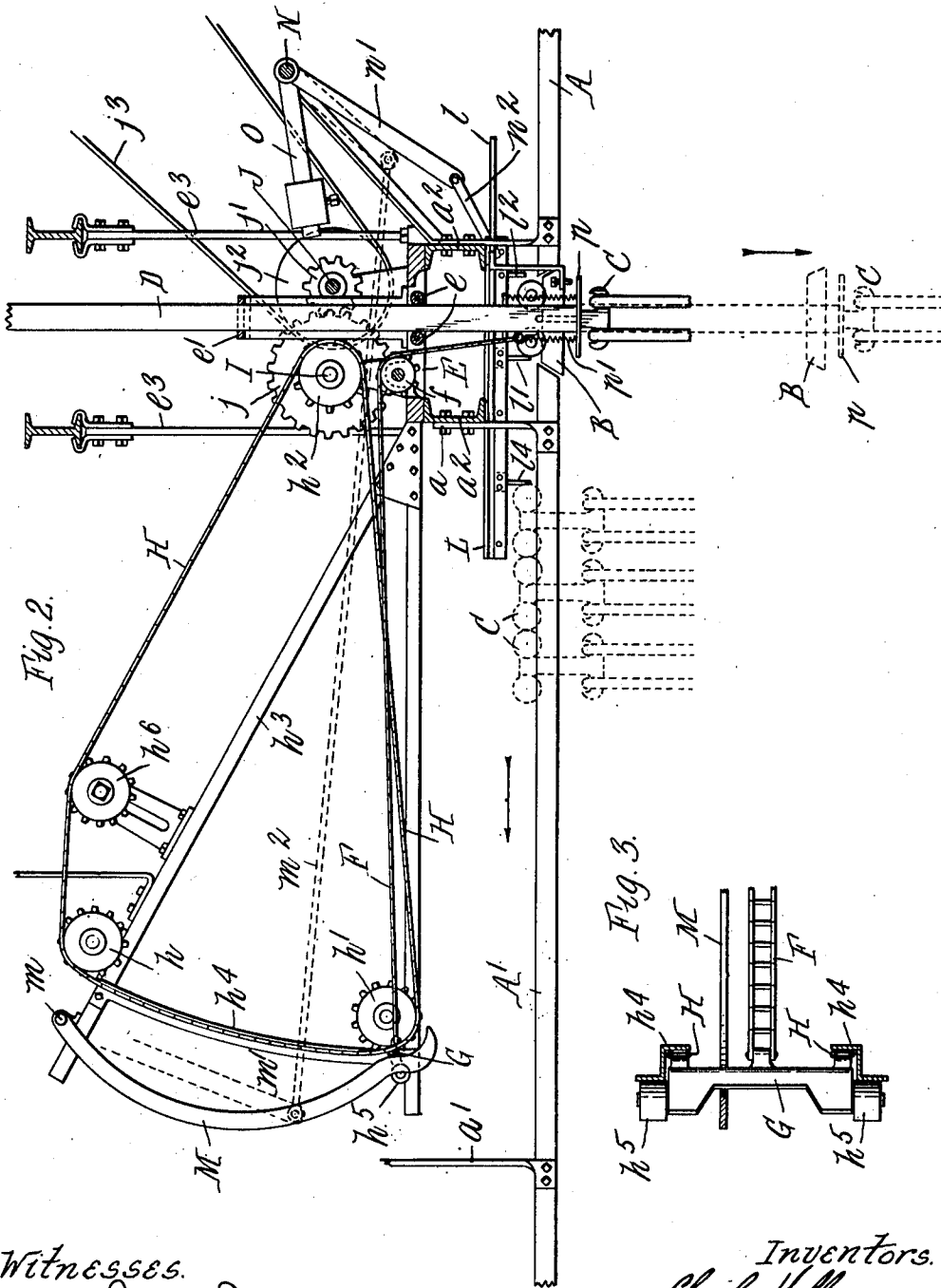
Charles Vallone.  
Frank R. Rogers.  
By William Parker Ward  
Attorneys.

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Witnesses.  
A. P. Diamond.  
C. H. Bund.

Inventors.  
Charles Vallone,  
Frank P. Rogers.  
By William R. Ketchum,  
Attorneys.

C. VALLONE & F. R. ROGERS.

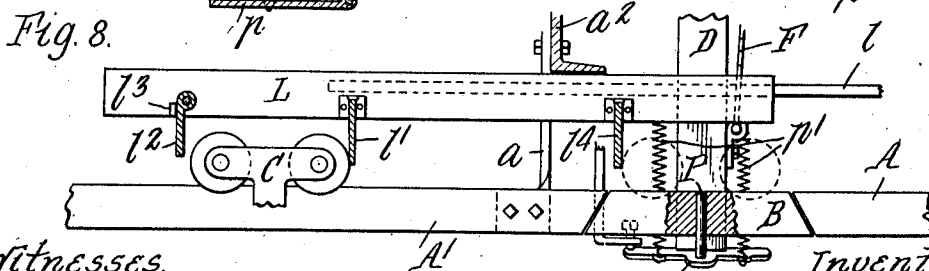
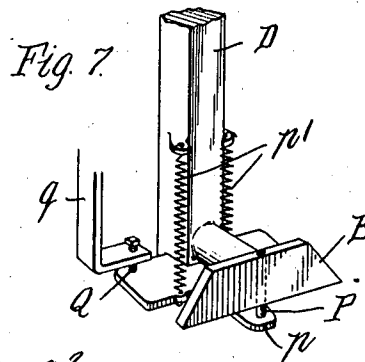
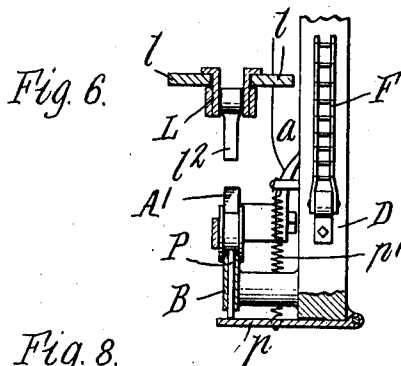
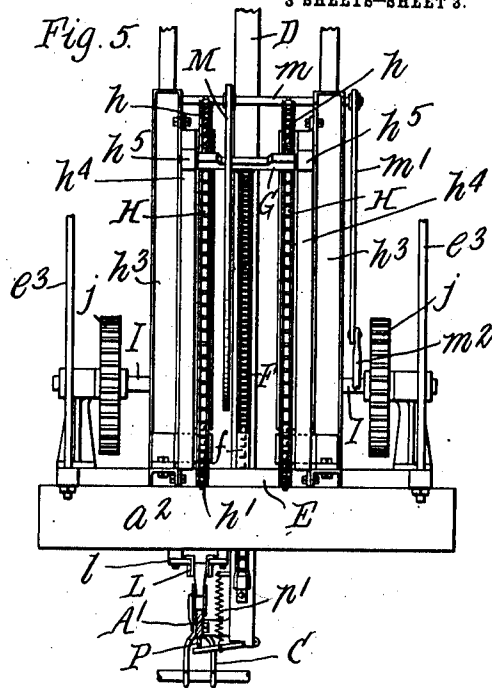
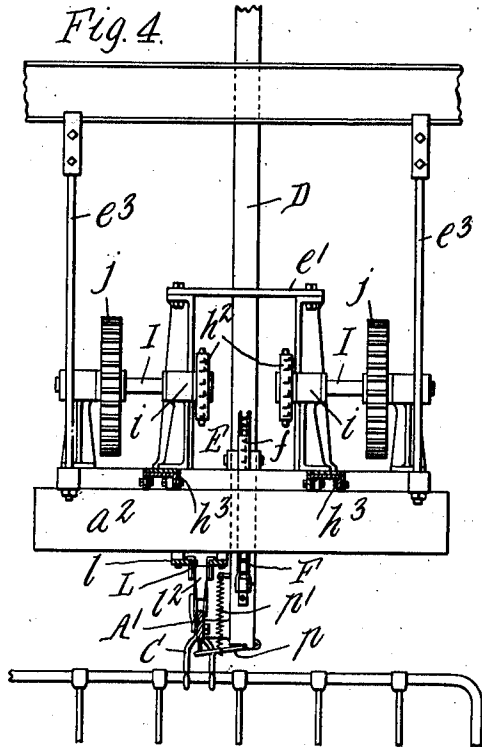
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3 SHEETS—SHEET 3.



Witnesses.

A. G. Dimond

C. H. Durd

Inventors.

Charles Vallone,  
Frank R. Rogers,  
By William F. Ward  
Attorneys.

# UNITED STATES PATENT OFFICE.

CHARLES VALLONE AND FRANK R. ROGERS, OF BUFFALO, NEW YORK, ASSIGNORS TO  
BARCALO MANUFACTURING COMPANY, OF BUFFALO, NEW YORK.

## DIP PAINTING-MACHINE.

980,030.

Specification of Letters Patent.

Patented Dec. 27, 1910.

Application filed October 7, 1909. Serial No. 521,517.

*To all whom it may concern:*

Be it known that we, CHARLES VALLONE and FRANK R. ROGERS, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Dip Painting-Machines, of which the following is a specification.

This invention relates more particularly to improvements in dip painting machines of that sort in which the articles to be painted, such, for example, as metal bedstead frames, are hung on carriages or carriers which travel on an elevated track provided with a vertically movable or elevating section which is arranged over a tank containing paint and is adapted to be lowered with the carrier thereon to immerse the article in the paint and to be again raised into position for the carrier to move off of the same onto a track leading to a drying room or other place where it may be desired to deliver the articles after being dipped. The improvements are not, however, restricted in application to painting machines but are also applicable to machines or apparatus used for other purposes, where it is desired to provide means for raising or lowering a traveling carrier from a track at one elevation to another elevation.

One of the objects of the invention is to produce a practical and efficient dip painting machine which is capable of rapid operation and in which the carrier, after the article has been placed thereon, is automatically moved onto the elevating track section, the track section lowered to immerse the article and returned to the initial position, and the article carrier then moved with its article off of the elevating track section onto the track leading to the drying room or other place.

Other objects of the invention are to produce an automatic dip painting machine of this character which is of simple, strong and durable construction, that can be readily installed at a comparatively small expense; and to improve dip painting machines in the respects hereinafter described and set forth in the claims.

In the accompanying drawings, consisting of three sheets: Figure 1 is a side elevation, partly in section, of a dip painting machine

embodying the invention, showing the normal position of the parts thereof. Fig. 2 is a sectional elevation thereof, showing a different position of the parts. Fig. 3 is a fragmentary sectional plan view, on an enlarged scale, in line 3—3, Fig. 1, of the actuating device for the article carrier. Fig. 4 is a transverse sectional elevation of the machine in line 4—4, Fig. 1. Fig. 5 is a rear end elevation thereof. Fig. 6 is a fragmentary sectional elevation, on an enlarged scale, of the elevator and the operating device for the article carrier. Fig. 7 is a fragmentary perspective view, on an enlarged scale, of the elevating track section and the latch for retaining the article carrier thereon. Fig. 8 is a fragmentary elevation, partly in section, on an enlarged scale, showing the opposite side of the machine from that shown in Figs. 1 and 2.

Like reference characters refer to like parts in the several figures.

A A' represent two stationary portions of an elevated or overhead track of any suitable construction, and B represents a vertically movable or elevating track section, which normally occupies a position between the stationary portions of the track so as to form therewith a continuous track upon which carriers or carriages C are adapted to travel. The carriers may be of any suitable construction enabling the articles to be readily hung thereon. The track is arranged with the elevating section B located vertically over a tank or well (not shown) containing paint in which the articles are adapted to be immersed for coating them, by lowering the elevating section, together with the carrier and article hanging thereon. The stationary portions of the track are supported in any suitable manner, for instance, by hangers  $a$  and  $a'$  depending from transverse beams  $a^2$ , and other suitable overhead supports (not shown).

The elevating track section B is carried by a suitable elevator or hoist, which, in the construction shown, comprises a rod or plunger D having a laterally projecting foot to which the track section is secured and which is adapted to reciprocate vertically in a stationary guide consisting of antifriction rollers  $e$ , Fig. 2, journaled in an opening in a platform E supported on the

beams  $a^2$ , and a horizontal plate  $b'$  which is supported by uprights rising from the platform and has a guide opening through which the plunger passes.

$e^3$  represents hangers suspended from overhead beams and secured to the corners of the platform E for assisting in supporting the same.

The plunger D is raised and lowered by a chain F which is attached at one end to the lower end of the plunger, passes over a sprocket wheel  $f$  suitably journaled on the platform E, and is attached at its opposite end to a cross bar G connecting two parallel endless driven sprocket chains H H, each of which passes around sprocket wheels  $h$   $h'$   $h^2$  arranged to hold these chains in substantially triangular form. The sprocket wheels  $h$  and  $h'$  are suitably journaled at different elevations on parallel frames  $h^3$  which may be constructed and supported in any suitable manner. Between the sprocket wheels  $h$  and  $h'$  the frames  $h^3$  are provided with guide bars  $h^4$  which are curved concentrically with the axis of the sprocket wheel  $f$  for the elevator chain F and on which rollers  $h^5$  at the ends of the cross bar G, connecting the driven chains H H, travel. By reason of this arrangement of the parts, the driven chains H H, as they travel around the sprocket wheels  $h$   $h'$   $h^2$  in the direction indicated by the arrows in Figs. 1 and 2, operate through the chain F to raise the plunger D during the travel of the cross bar G from the sprocket wheels  $h^2$  to the sprocket wheels  $h$ , then hold it stationary in the elevated position with the elevating track section B between the stationary portions of the track during the travel of the cross bar G over the curved guide rails  $h^4$  between the sprocket wheels  $h$  and  $h'$ , and then allow the plunger to descend by gravity during the travel of the cross bar from the sprocket wheels  $h'$  to the sprocket wheels  $h^2$ .

$h^6$  represents idle sprocket wheels which are suitably journaled on the frame  $h^3$  so that they can be adjusted for keeping the driven sprocket chains H H taut.

The chains H H may be driven by any suitable drive mechanism, for instance, as shown in the drawings, the two sprocket wheels  $h^2$  are secured to the inner ends of two horizontal shafts I I which are journaled in bearings  $i$   $i$  on the platform E adjacent to the elevator or plunger D and are geared, for instance, by which  $j$  and  $j'$  to a drive shaft J which is journaled in bearings on the platform E and is provided with a pulley  $j^2$  for a drive belt  $j^3$ , see Figs. 1 and 2.

The article carriers or carriages C are moved onto and off of the elevating track section during the period of time that the same is held stationary between the stationary portions of the track, by suitable mechanism, which, as shown, is constructed

as follows: L, Figs. 6 and 8, represents a slide which reciprocates horizontally over the carrier track on suitable guide rails  $l$  which are secured to the bottoms of the supporting beams  $a^2$ . A rigid stop or finger  $l'$  depends from this slide and in rear of this rigid finger is a depending pushing finger  $l^2$  which is pivoted to the slide and is adapted to swing forwardly, but is prevented from swinging rearwardly beyond a vertical position by a stop  $l^3$ , Fig. 8, or other means. While the slide L is held stationary in its normal position by its operating mechanism, a carrier C, on which one or more articles to be painted have been hung, is rolled under the slide past the pivoted pushing finger  $l^2$  against the stop finger  $l'$ , as shown in Fig. 1, and the pivoted finger swings down by gravity behind the carrier C, so that when the slide is moved forwardly the pushing finger  $l^2$  will engage the carrier and roll it forwardly along the track onto the elevating track section.  $l^4$  represents another rigid finger which depends from the slide L for engaging the carrier C and shoving it off of the elevating track section at the next forward movement of the slide.

The slide L is reciprocated, in the machine illustrated, by means operated intermittently by the driven sprocket chains H H, said means comprising a cam lever M which is secured to a rock shaft  $m$  journaled on the upper portions of the supporting frames  $h^3$  for the chains H H and normally depends from said shaft in the path of the cross bar G, connecting the chains H H, as shown in Fig. 1. The rock shaft  $m$  is provided with a rock arm  $m'$  connected by a rod  $m^2$  to a rock arm  $n$  on a rock shaft N which is journaled on brackets projecting from the platform E and is provided with a rock arm  $n'$  connected by a link  $n^2$  to the slide L. As the cross bar G, connecting the driven chains H H, moves downwardly along the curved guide bars  $h^4$  between the sprocket wheels  $h'$  and  $h^2$ , it engages the cam lever M and swings the same outwardly, as shown in Fig. 2, which, through the described connections, advances the slide L, and as the elevator is held stationary in its upper position during this time, as before explained, the slide L is advanced at the proper time to move the carrier which is on the elevating track section off of the same and to move another carrier onto the elevating track section. A weighted arm O is shown on the rock shaft N which, as soon as the cross bar G clears the lower end of the cam lever M and frees the lever, drops by gravity and retracts the slide L and returns the cam lever to their initial positions shown in Fig. 1. The slide is retracted during the travel of the cross bar G toward the elevator along the lower substantially horizontal limbs of the endless sprocket chains

H H and consequently during the descent of the elevator.

The elevating track section is provided with a latch or device for holding the carrier thereon during the vertical movement of the track section. The latch shown, see particularly Figs. 6-8, consists of a pin P which is adapted to be projected upwardly through a hole in the elevating track section between the wheels of the carrier C on the track section. The pin is connected at its lower end to one end of a lever or plate *p* which is pivoted at its opposite end to the lower end of the plunger D. Springs *p'* connecting the latch lever *p* to studs projecting from the plunger, normally tend to lift the lever and project the upper end of the latch above the upper edge of the track section. When the track section is raised into position between the stationary portions of the track an adjustable screw or stop Q on a suitable stationary bracket *q* strikes the latch lever and retracts the latch pin, thus permitting the carrier to roll freely from the fixed track section onto the elevating track section, but when the elevating track section commences to descend, the latch lever *p* moves out of engagement with the stop Q and its springs immediately project the latch pin upwardly between the wheels of the carrier so as thereby to prevent the carrier from rolling off of the track section. When the elevating track section is again raised into the normal position between the stationary portions of the track, the stop Q strikes the lever *p* and retracts the latch, thus allowing the carrier to be shoved off of the elevating track section.

The operation of the machine is as follows: An article to be painted is hung on one of the carriers C on the track and the carrier is moved under the slide L in front of the pushing finger *l'* and against the stop finger *l''*. The slide is advanced by the described mechanism and the carrier is pushed by the finger *l'* onto the elevating track section B which lowers with the carrier and its article, immersing the latter in the paint. When the elevating track section commences to descend, the latch P is actuated to hold the carrier on the track section. The elevating track section is then raised into place between the stationary portions of the track and the latch is retracted. At the next forward movement of the carrier moving slide, the finger *l'* thereof engages and shoves the carrier off of the elevating track section onto the portion of the track leading to the drying room or other place, and the pushing finger *l'* moves another carrier, which, in the meantime, has been moved into position in front of said finger, onto the elevating track section, ready to be lowered by the elevator for immersing the article in the paint tank. It is only necessary for the operator to hang

the articles into position to be engaged and actuated by the carrier moving slide, which can be done easily and with great expedition. Otherwise, the machine is entirely automatic in its action. It runs continuously and there are no starting and stopping or other devices requiring to be manipulated.

The several mechanisms described for moving the carriers onto and off of the elevating track section while the latter is stationary, for raising and lowering this track section, and for retaining the carriers on the elevating track section during the vertical movements thereof and releasing them when the track section is in its receiving and discharging position, are efficient and desirable and are therefore preferred, but mechanisms of other construction can be employed for performing these several functions without departing from the scope of this invention.

We claim, as our invention:

1. The combination with a track having a movable section, and a carrier which is free to travel on the track, of an elevator for said movable track section, a carrier-moving device which is disconnected from said carrier and is adapted to engage and move the carrier and then leave the carrier free to continue its travel, driven mechanism which is operatively connected to said elevator for moving the movable track section away from and returning it to the track, and which is operatively connected to said carrier-moving device to move a carrier onto said movable track section while the same is stationary, substantially as set forth.

2. The combination with a track having a movable section, and a carrier which is free to travel along the track, of an elevator for said movable track section, driven mechanism which operates said elevator to move said movable track section away from and return it to the track and then hold it stationary for a period of time, a carrier-moving device which is disconnected from said carrier and is adapted to engage and move the carrier and then leave the carrier free to continue its travel, and mechanism operated by said driven mechanism for actuating said carrier-moving device to move a carrier onto said movable track section during the rest period thereof, substantially as set forth.

3. The combination with a track having a movable section, and a carrier which is free to travel along the track, of an elevator for said movable track section, driven mechanism which operates said elevator to move said movable track section away from and return it to the track and then hold it stationary for a period of time, a reciprocating carrier-moving device which is disconnected from said carrier and which has means for engaging and moving a carrier,

and mechanism for advancing said carrier-moving device to move a carrier onto said movable track section during the rest period thereof and retracting the carrier-moving device during the vertical movement of said movable track section, substantially as set forth.

4. The combination with a track, and a traveling carrier which is free to move along the track, of an elevator adjacent to the track and having a part adapted to receive the carrier from the track, a driven mechanism which moves said elevator away from the receiving position and returns it to and holds it in the receiving position for a period of time, and means which are disconnected from said carrier and are operated by said driven mechanism and which are adapted to move a carrier from the track onto said elevator during the rest period thereof and leave the carrier free to continue its travel, substantially as set forth.

5. The combination with a track having a movable section and a carrier which is free to travel on the track, of an elevator for said movable track section, a reciprocating carrier-moving device which is disconnected from said carrier and is provided with means which permit the carrier to be interlocked with said carrier-moving device and which engage and move the carrier when the carrier-moving device is moved, whereby the carrier is moved by said device onto said movable track section, said carrier-moving device having a part which shoves the carrier off of said track section, substantially as set forth.

6. The combination with a track, and a carrier which travels on the track, of an elevator adjacent to the track and having a part adapted to receive the carrier from the track, a driven endless chain and a flexible member connected to said endless chain and to said elevator for operating the latter, and intermittently operating mechanism actuated by said endless chain for moving a carrier from the track onto said elevator when the elevator is in the receiving position, substantially as set forth.

7. The combination of a track having a section which is movable to and from the track, of a flexible connection attached to said movable track section, a driven endless chain to which said flexible connection is attached and which is arranged to move said movable track section to a receiving position adjacent to the track and to hold it in the receiving position for a period of time, and means operated by said driven chain for moving a device from the track onto said movable track section when it is in its receiving position, substantially as set forth.

8. The combination with a track, and a carrier which travels on the track, of an elevator adjacent to the track and having a

part adapted to receive the carrier from the track, a flexible operating connection for said elevator, driven endless chains to which said flexible connection is attached and which are arranged to reciprocate said elevator and hold it stationary for a period of time in the receiving position, and means operated by said driven chains for moving a carrier from the track onto said elevator when the elevator is in the receiving position, substantially as set forth.

9. The combination with a track having a movable section, and a carrier which travels on the track, of a flexible connection attached to said movable track section, a driven endless chain to which said flexible connection is attached and which is arranged to move said movable track section away from a receiving position adjacent to the track and return it to and hold it in the receiving position for a period of time, and means operated by said driven chain for moving a carrier from the track onto said movable track section when it is in the receiving position, substantially as set forth.

10. The combination with a track having a movable section, and a carrier which travels on the track, of a flexible connection attached to said movable track section, a guide wheel over which said flexible connection passes, a driven endless chain to which said flexible connection is attached and which is arranged so that a portion thereof travels in a path substantially concentric with said wheel whereby said movable track section is moved away from a receiving position adjacent to the track and is returned to and held in the receiving position for a period of time, and mechanism for moving the carrier from the track onto said movable track section when it is in the receiving position, substantially as set forth.

11. The combination with a track having a movable track section, and a carrier which travels on the track, of driven mechanism which moves said movable track section away from a receiving position adjacent to the track and returns it to and holds it in the receiving position for a period of time, a reciprocating carrier-moving device having a part for pushing the carrier and a stop for holding the carrier in operative relation to said pushing part, and mechanism for operating said carrier-moving device to move the carrier from the track onto said movable track section when it is in the receiving position, substantially as set forth.

12. The combination with a track having a movable track section, and a carrier which travels on the track, of driven mechanism which moves said movable track section away from a receiving position adjacent to the track and returns it to and holds it in the receiving position for a period of time, a reciprocating carrier-moving device having

a pivoted finger for pushing the carrier and past which the carrier is adapted to be moved, and a finger for arresting the carrier in front of said pushing finger, and mechanism for operating said carrier-moving device to move the carrier from the track onto the movable track section when it is in the receiving position, substantially as set forth.

Witness our hands, this 1st day of October, 1909.

CHARLES VALLONE.  
FRANK R. ROGERS.

Witnesses:

ANNA J. MOONEY,  
MADELINE W. DEHLINGEN.