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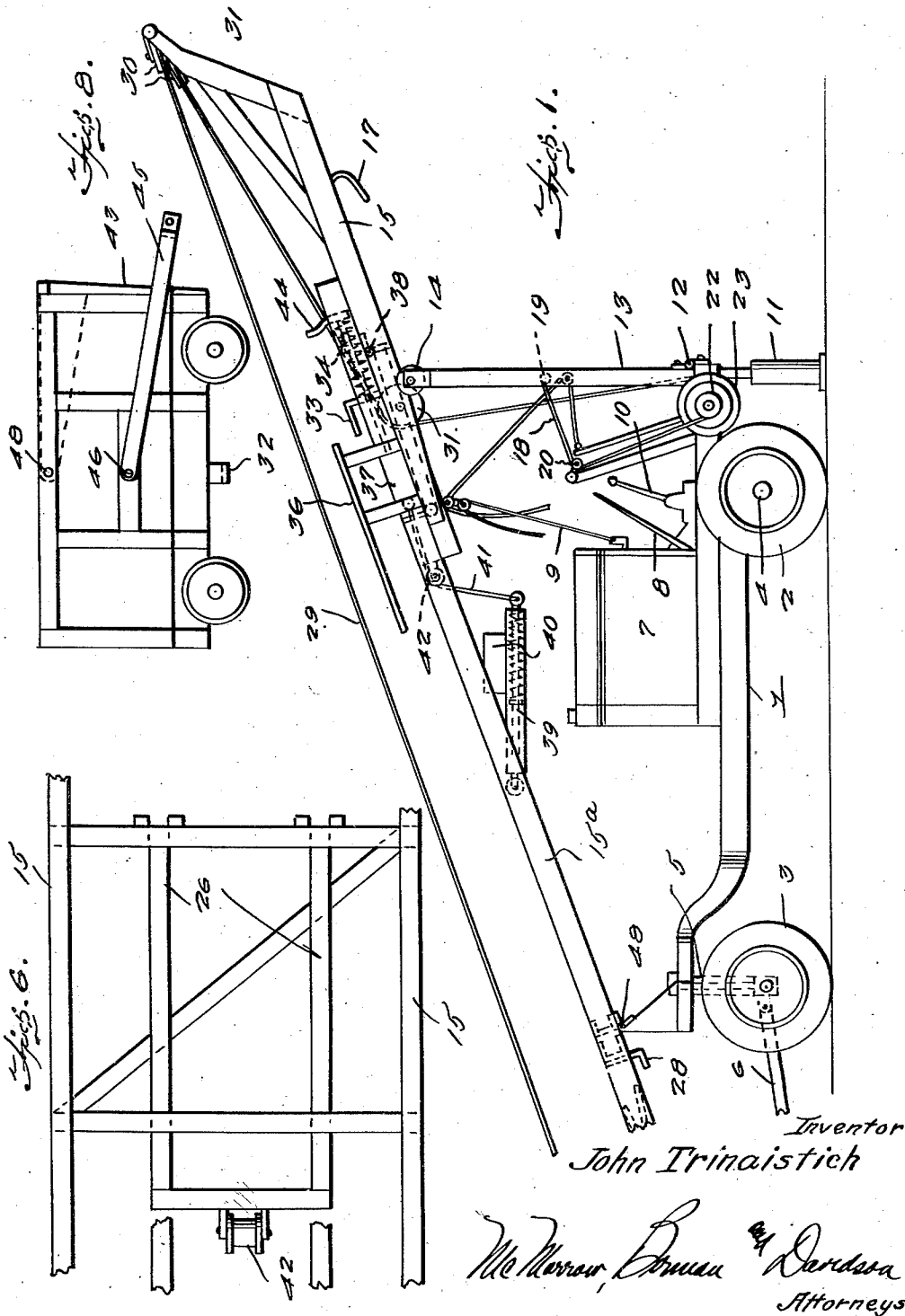
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2,420,848

MATERIAL EXCAVATING AND LOADING MACHINE

Filed Nov. 30, 1945

3 Sheets-Sheet 1



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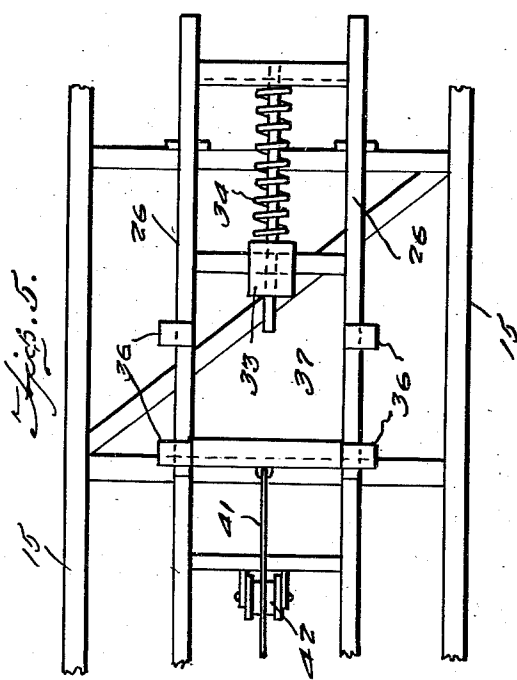
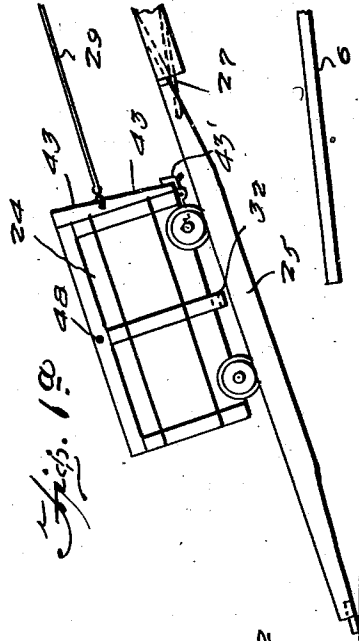
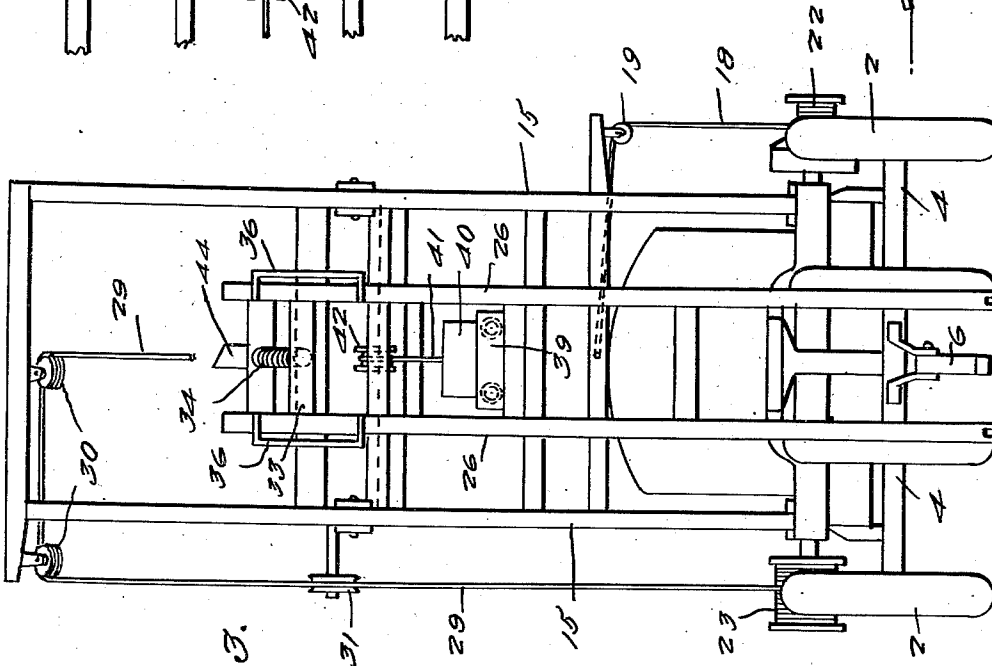
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3 Sheets-Sheet 2



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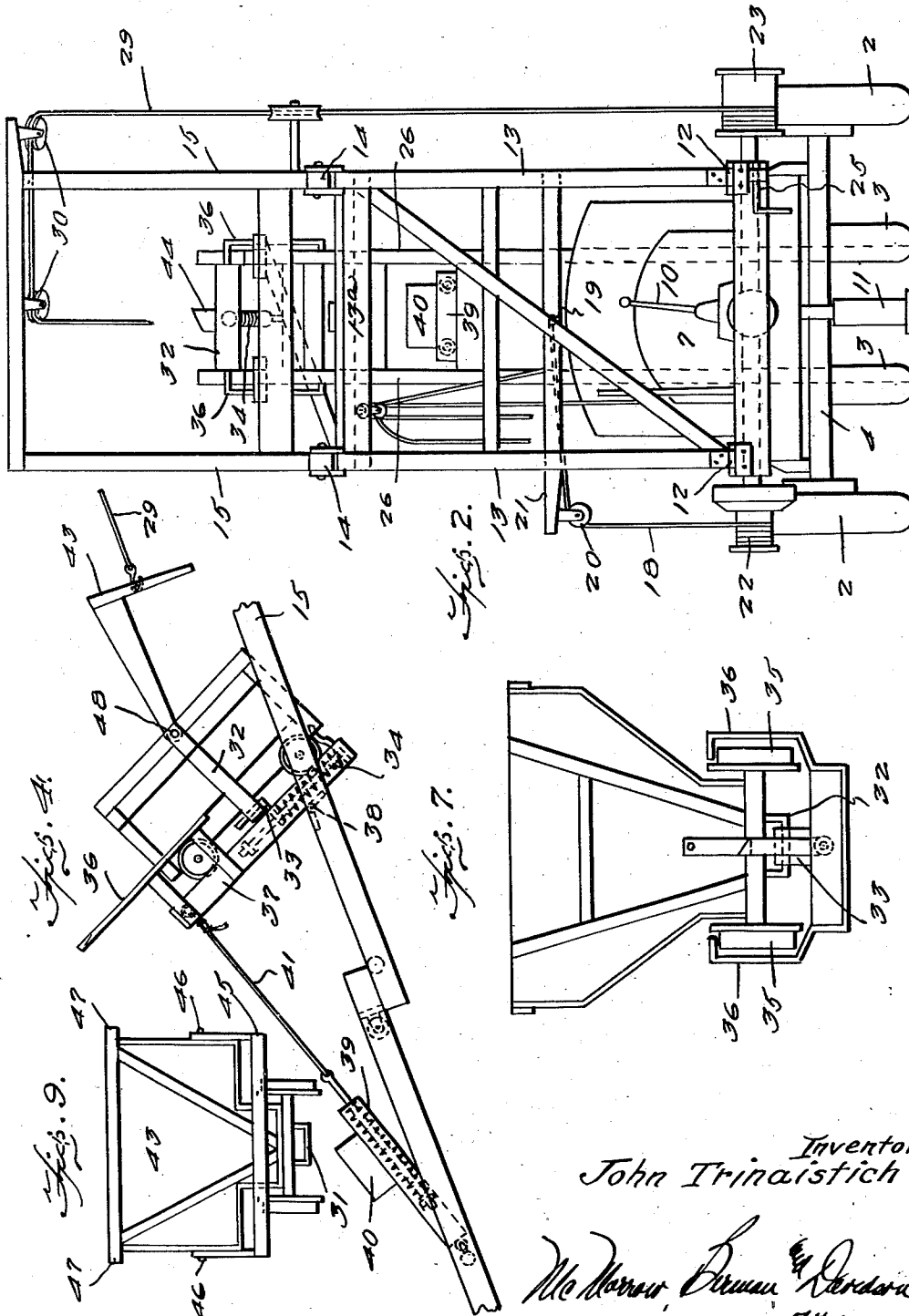
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MATERIAL EXCAVATING AND LOADING MACHINE

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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MATERIAL EXCAVATING AND LOADING
MACHINE

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3 Claims. (Cl. 214-104)

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This invention relates to portable devices adapted to be moved and located at any spot wherein excavation is to be made and its primary object is to provide a simple, transportable device for moving material from one level to another higher level and for automatically dumping said material at said higher level.

It is a further object of my invention to provide a machine for assisting in the excavation of material such as coal, sand, gravel or dirt and the removal thereof to position above a dump truck or other means of transportation and for releasing such material into said dump truck or other means of transportation by automatic means.

It is a further object of my invention to provide a device of the character described which is simple to operate under control of a single operator, and which is simple, rugged and economical to build and operate.

It is a still further object of my invention to provide a device of the character described which shall be adaptable to ready disassemblage for stowage in relatively small space or for ease of transporting.

With the above and other objects in view, which will more fully appear hereinafter, the present invention consists in certain novel details of construction and arrangement of parts, of which a preferred embodiment is fully described and illustrated in the following specification and the accompanying drawings, and more particularly pointed out in the appended claims.

Refer now to the drawings, wherein similar numerals of reference are employed to designate corresponding parts in the several views, and wherein:

Figure 1 taken together with Figure 1a represents an elevational view of my device, showing the prime mover, controls and mechanism for hoisting and dumping a dump truck, in accordance with my invention.

Figure 2 represents a rearward end view of my device.

Figure 3 represents a forward end view of my device, showing particularly details of the frame structure.

Figure 4 illustrates the mechanism for dumping, in elevation, showing a truck in dumped position.

Figure 5 represents the rocker dump assembly, in plan view.

Figure 6 represents a portion of the machine

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upon which the rocker dump assembly of Figure 5 is mounted.

Figure 7 is an end view of one dump truck used in my invention, and includes certain details of a tiltable dumping assembly.

Figure 8 is an elevational view of second embodiment of my dump truck.

Figure 9 is an end view of the dump truck of Figure 8.

Referring now particularly to the drawings, numeral 1 represents the chassis of a conveyance for my novel device, having two rearward rubber-tired wheels 2, and two forward rubber-tired wheels 3. The rearward wheels 2 are well spread to provide a solid foundation for my device. The forward wheels 3 are set closely together to provide for ease of maneuver of the entire machine. The rearward wheels are mounted on an axle 4, of conventional type. The forward wheels, on the other hand, are mounted on an assembly 5, journal in frame 1 and rotatable about a vertical axis, for ready and easy spotting of my machine by maneuvering of tongue 6, which serves as a means of pulling, pushing and turning my machine.

Mounted on frame 1 is a power source in the form of a gasoline engine 7, having a clutch control rod 8, a starter and ignition control cable 9 and a gear ratio control rod 10. I use an engine designed and manufactured for use in a popular make of automobile and include an automobile transmission mechanism and differential drive in my machine but the specific mode of construction of the engine transmission and drive are not part of my invention, per se, but only insofar as said mechanisms provide controllable power for my machine.

Adjacent the rearward end of my machine is a jack 11 for supporting frame 1 when heavy loads of sand, gravel, etc., are in dumping position. Jack 11 is hingedly secured to frame 1, and may be folded upwardly when it is desired to move the machine. Any desired type of jack available in the prior art may be used in the practice of my invention.

Hingedly secured to the rearward end of my machine, as by hinges 12 is a U-shaped stanchion 13, having top frame member 13a, the stanchion standing vertically when my machine is in operative position, as illustrated in Figure 1. Stanchion members 13 carry at their upper end wheels 14, which ride the under side of channel 15. Stanchion 13 is pivotable about hinges 12, rearwardly of its vertical position, and in so pivoting, the elevator device denominated generally by

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numeral 16 and supported on channel irons 15, 15¹ is lowered to a position more suitable for transportation of my machine, said channels pivoting about hinge 48. Hooks 17 secured to rail 15 serve as rearward stops for wheels 14, preventing further rearward travel thereof.

Motive power for pivoting stanchion 13 is provided by cable 18, which is secured at point 19 to stanchion 13, passes over pulley 20 which is secured to stanchion 21 and thence passes to drum 22, which is driven from the engine 7. While drum 22 is being rotated, drum 23 which provides power for raising dump truck or car 24 is locked in irrotatable position by key 25 (Figure 2) which may be inserted in apertures of drum 23.

Dump car 24 rides on rails 26, mounted between channels 15, 15a and supported thereby. Rail and channel section 25 is pivotally or hingedly mounted with respect to channels 15a by means of hinge 27, and the forward end thereof may be raised, when the machine is not in use or being transported and may in this case be hooked to car 24, which is secured in such case, by hook 28 adjacent the forward end of channel 15a. Hook 28 may be turned upwardly for this purpose but normally occupies the inoperative position shown in Figure 1.

The dump car 24 is, for hoisting purposes, provided with a ring bolt to which is hooked cable 29 which proceeds over pulleys 30, depending from stanchion 31, and thence proceeds over pulley 31 and to drum 23 which provides power for hoisting the dump car 24. Drum 23 is, as hereinbefore described, driven from motor 7 via the usual clutch, transmission and drive associated with conventional automobiles. The dump truck is, by means of force applied to cable 29, pulled or hoisted along tracks 26 to a point such that a U-shaped strap 32 secured to the truck and depending underneath the said truck is secured by hook 33 forming a stop latch. Hook 33 presents a metallic strap bent at right angles, having one arm parallel to the tracks and the other secured to a compression spring 34, which is in turn secured to tiltable platform 37. Hook 33 when secured by U-shaped strap 32 prevents movement of car 24 beyond a desired point, and compression spring 34 takes up the shock of impact of the car 24 upon the hook 33. Having arrived at the position indicated above, i. e., in juxtaposition to hook 33 the car wheels 35 are located between guard rails 36, which overlie the wheels as shown in Figure 7 and which are secured to rails 26. This construction assists in preventing the car leaving the rail when being tilted for dumping.

When car 24 has arrived in position to be secured by right angled hook 33 it rests upon a platform 37, tiltable with respect to the rails 26, and coextensive therewith. Tilting is accomplished by pivoting platform 37 about hinge 38, by virtue of the pull of cable 29 on car 24, said car being secured against movement with respect to platform 37 by hook 32 and guard rails 36, which in turn are secured to tiltable platform 37. Tilting is accomplished against a restoring force provided by spring assembly 39, which absorbs some of the impact produced by the dumping operation, and by restoring force provided by weight 40, which tends to restore platform 37 and car 24 to normal position with respect to rails 26 after release of tension in cable 29.

Spring assembly 39 and weight 40 are coupled to tiltable platform 37 by means of cable 41 riding

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over pulley 42 and secured to tiltable platform 37 in any convenient manner.

Dump truck 24 is supplied with a door 43, to which is attached cable 29 by means of a hook and an eye bolt secured to the cable and the door respectively. The door 43 is normally held against opening in response to tension in cable 29 by a latch 43', as shown in Figure 1a. However, latch release or trigger 44 acts upon arrival of dump truck into dumping position to release the latch, whereupon, simultaneously with the tilting motion of the entire truck, door 43 swings open, pivoting on pivot 48, as best illustrated in Figure 4.

After a dumping action has been completed, tension on cable 29 is released by releasing of the clutch associated with the prime mover of my machine or by reversing the direction of drive of the prime mover, whereupon spring assembly 39 and weight 40 pull the tilt assembly 37 and consequently the car into normal position with respect to the rails, the weight of the door 43 causes it to close and the entire car, due to gravitational action proceeds down the tracks 13, to a position suitable for acquiring another load of material.

In Figures 8 and 9 is illustrated a type of dump car or car which is of slightly different character than that shown associated with Figures 1, 1a and 4. In the car of Figure 8 the cable 29, instead of being hooked directly to the door of the dump car, is secured to a U-shaped draw bar 45, pivoted at points 46.

The door 43 in the car of Figures 8 and 9, comprises two ears or lugs 47 of sufficient extension to be impinged upon by the arms of draw bar 45 during the tilting process, which impingement causes opening of the door 43. This mode of construction has a slight advantage over that in which the door 43 is directly attached to cable 29, in that the door, in this mode, may close as soon as the car 24 has arrived nearly in parallel with the rails 13 after a dumping operation, without regard to the tension in cable 29.

While I have disclosed specific embodiments of my invention, it is to be realized that modifications of the arrangement and details of construction may be made without violating the spirit of the invention, and I desire, accordingly, to be limited only by the language of the following claims.

What I claim is:

1. In a portable elevator, the combination, which comprises a track, means mounting said track on a truck body or the like in an inclined position, a movable section in said track providing a platform, means pivotally mounting said platform for dumping of a device thereon at a point spaced from the outer end thereof, a tension cylinder having a resilient element therein, means pivotally mounting said tension cylinder in the track at a point spaced from the inner end of the platform, a flexible element connecting the platform to the resilient element of the cylinder, means urging said cylinder downward providing tension in said resilient element, a stop latch, means resiliently mounting said stop latch in the platform, a door-releasing trigger on the resilient mounting means of the stop latch, a car mounted by wheels on said track, a door pivotally mounted at the forward end of said car, a latch element holding said door closed, said latch element positioned to be engaged by said trigger, a socket on said car positioned to be engaged by said stop latch, a cable attached to the door at the forward end of the car, a pulley centrally disposed in said

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track mounted at the upper end thereof around which the cable passes, means applying force to the cable for actuation of the car on the track, and means releasing said force after dumping of the car.

2. In a portable elevator, the combination, which comprises a track, means mounting said track in an inclined position on a truck body or the like, a movable section in said track providing a platform, means pivotally mounting said platform for dumping of a device thereon at a point spaced from the outer end thereof, a tension cylinder having a resilient element therein, means pivotally mounting said tension cylinder in the track at a point spaced from the inner end of the platform, a flexible element connecting the platform to the resilient element of the cylinder, means urging said cylinder downward providing tension in said flexible element, a stop latch, means resiliently mounting said stop latch in the platform, a door-releasing trigger on the resilient mounting means of the stop latch, a car mounted by wheels on said track, guard rails on the platform positioned to contact the upper surfaces of the wheels of the car to prevent accidental separation of the car from the platform, a door pivotally mounted at the forward end of said car, a latch element holding said door closed, said latch element positioned to be engaged by said trigger, a loop on said car positioned to be engaged by said stop latch, a cable attached to the door of the car, a pulley centrally disposed in the track mounted at the upper end thereof around which the cable passes, means actuating the cable to draw the car up the track, and means releasing said cable after dumping of the car.

3. In a portable elevator, the combination, which comprises a track, means mounting said track in an inclined position on a truck body or

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the like, a movable section in said track providing a platform, means pivotally mounting said platform for dumping of a device thereon at a point spaced from the outer end thereof, a stop latch, means resiliently mounting said stop latch in the platform, a car mounted by wheels on said track, guard rails on the platform positioned to contact the upper surfaces of the wheels of the car to prevent accidental separation of the car from the platform, a door pivotally mounted at the forward end of said car, a latch element holding said door closed, said latch element positioned to be engaged by releasing means as the car arrives on the platform, means on the car positioned to engage the stop latch to stop travel of the car, a cable attached to the car extending centrally upward of the track, said cable adapted to draw the car along the track, said platform adapted to be tilted to dumping position by the car as the car is stopped thereon by said stop latch, and means urging the platform to return to the position wherein it is aligned with the track after dumping thereof.

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