

June 24, 1930.

E. H. REMDE

1,768,149

INDUSTRIAL TRUCK

Filed Aug. 25, 1924

4 Sheets-Sheet 1

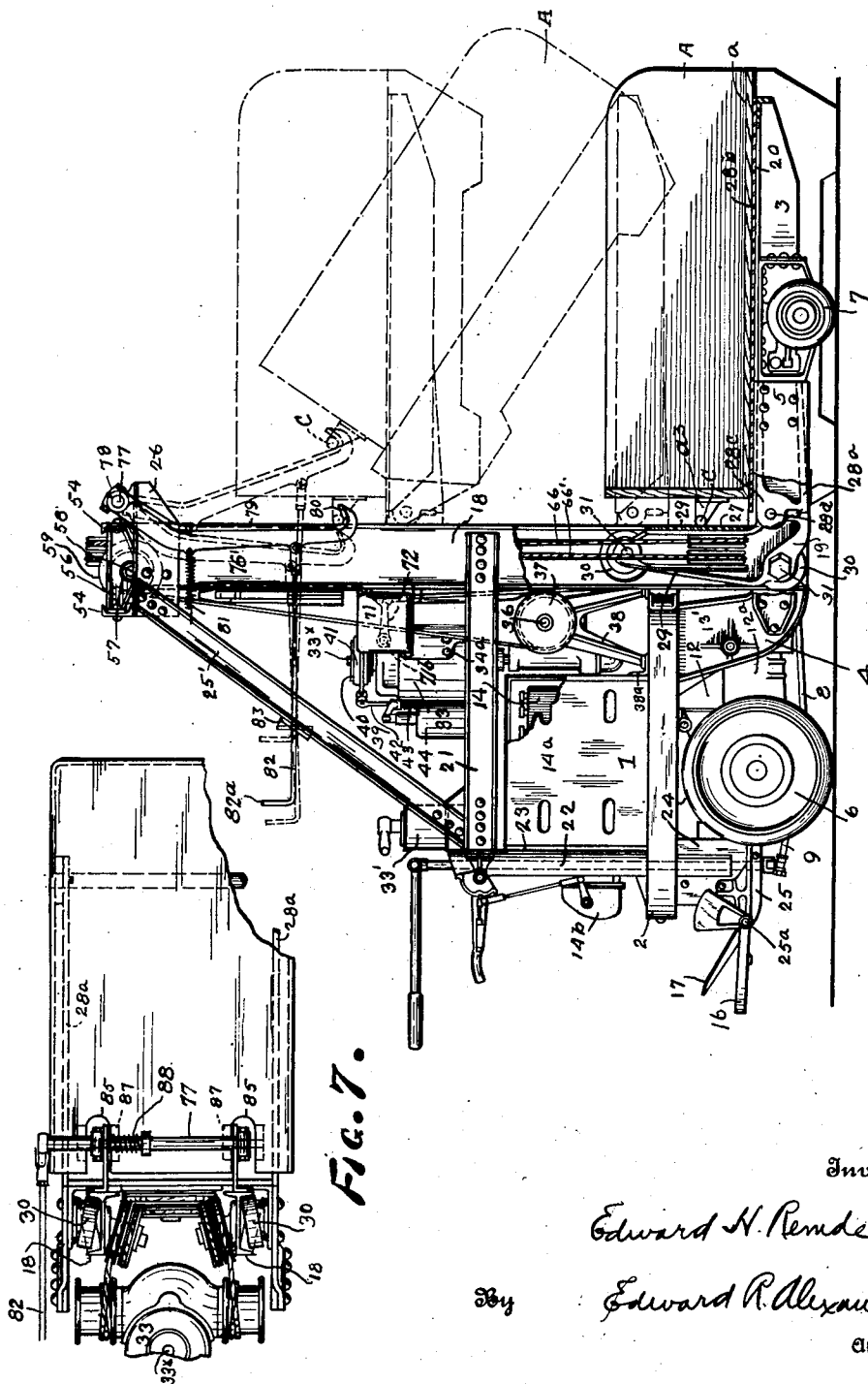


FIG. 1

FIG. 7.

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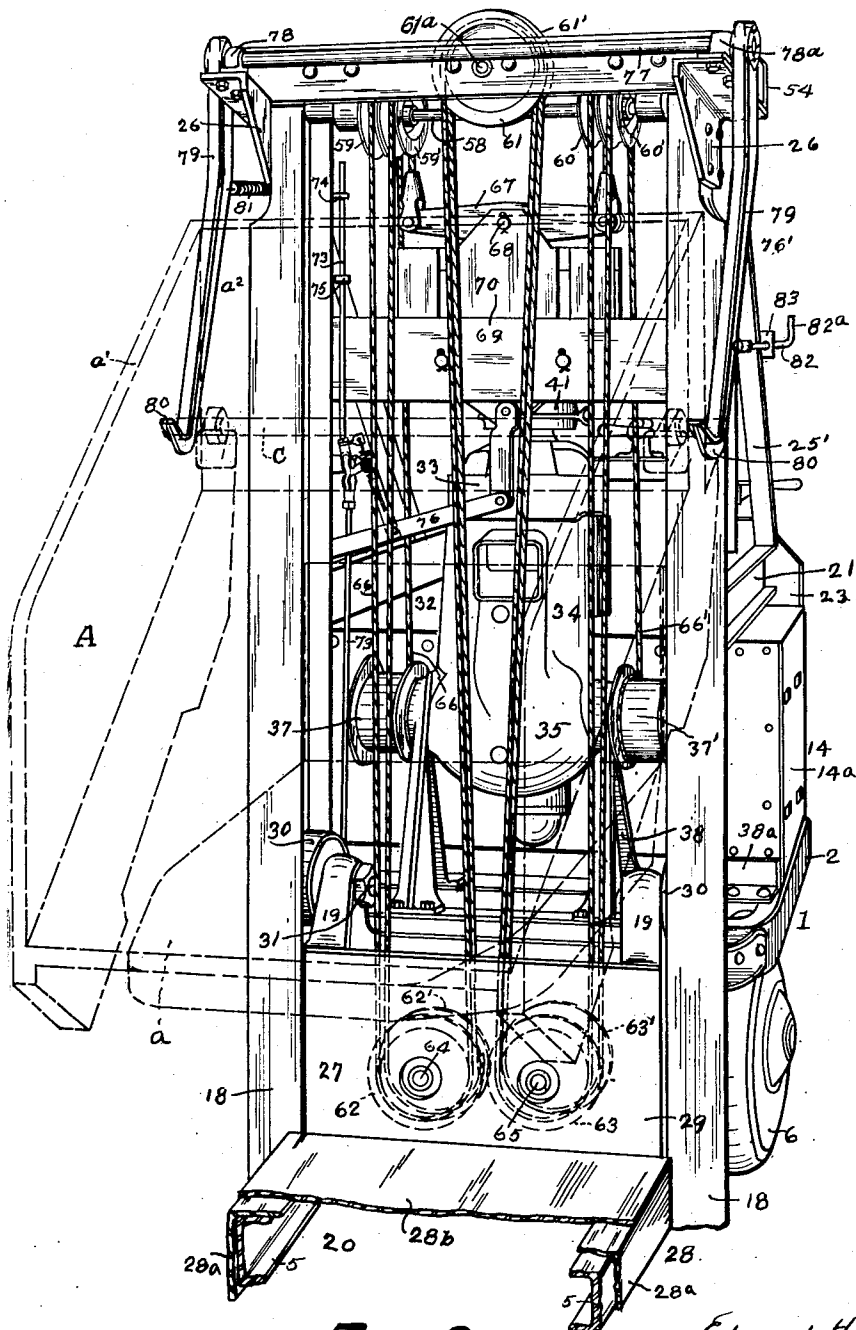


FIG. 2.

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4 Sheets-Sheet 3

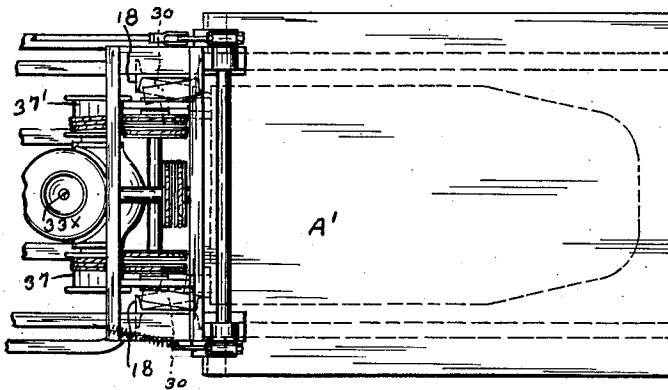


FIG. 4.

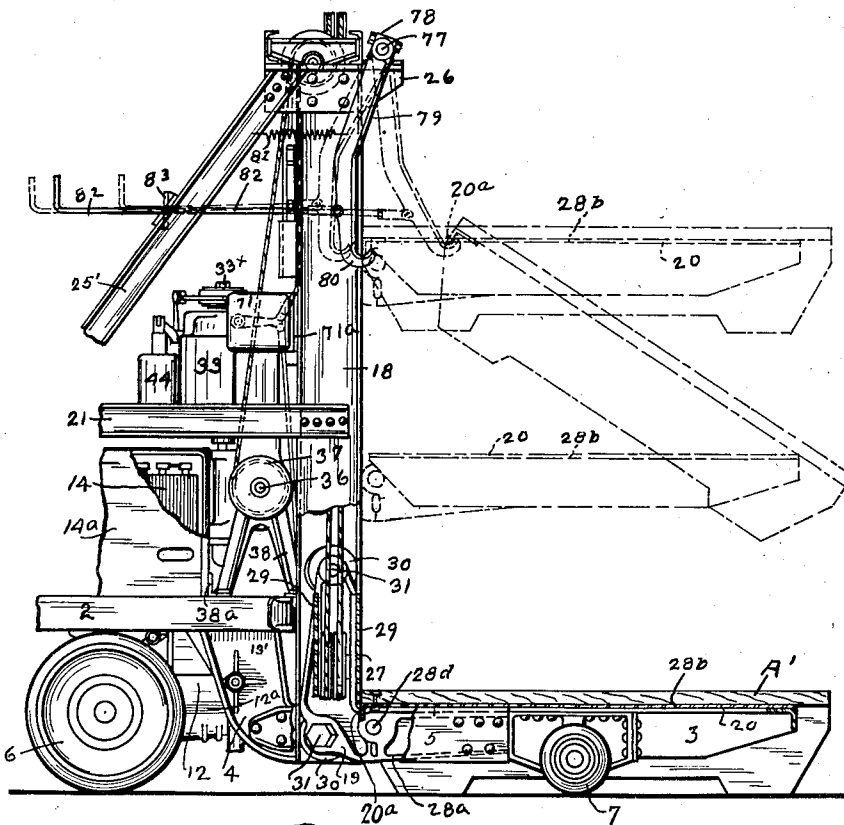


FIG. 3.

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Filed Aug. 25, 1924

4 Sheets-Sheet 4

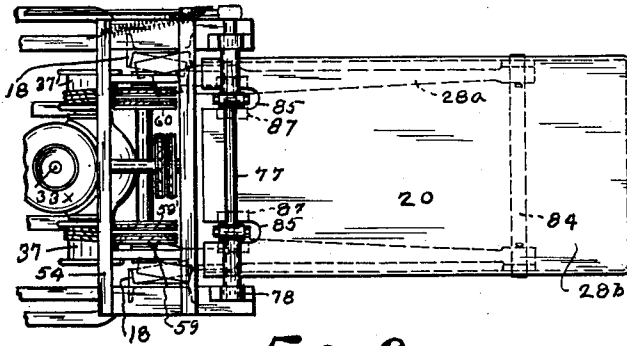


FIG. 6.

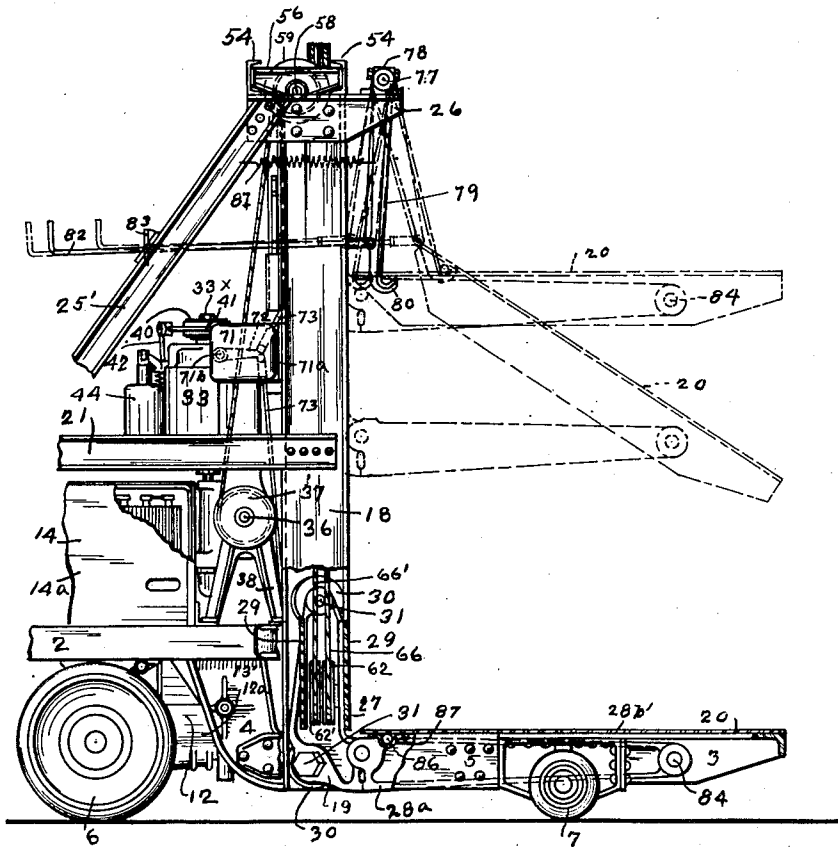


FIG. 5.

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INDUSTRIAL TRUCK

Application filed August 25, 1924. Serial No. 733,890.

This invention relates to an industrial truck having a raising and lowering mechanism for loading and unloading, raising and lowering, and transporting materials, goods, boxes and crates.

One object of the invention is to provide a truck of this character with improved means for dumping the goods from the elevating member of the truck, or the support or holder in which they are contained, to facilitate the handling and discharge thereof.

Another object of the invention is to combine with the raising and lowering mechanism of the truck an improved dumping or tilting means whereby the discharge of the materials, goods, boxes or crates is readily and easily effected.

Other objects of the invention will be apparent to those skilled in the art to which my invention relates from the following description taken in connection with the accompanying drawings, wherein

Fig. 1 is a view, partly in section and partly in side elevation, of a truck embodying my invention.

Fig. 2 is a perspective view, enlarged, (with parts broken away) looking at the raising and lowering mechanism and the dumping devices.

Fig. 3 is a fragmentary side elevation of a truck embodying my invention showing the use of a skid for holding and discharging the goods.

Fig. 4 is a top plan view of the parts shown in Fig. 3.

Fig. 5 is a fragmentary side elevation of a slightly different form of construction.

Fig. 6 is a top plan view of the parts shown in Fig. 5.

Fig. 7 is a fragmentary view showing a further modified form of construction.

My invention is capable of being incorporated or combined with a truck construction in which is provided an elevating member, such as a platform or a projecting member capable of being positioned below the article or body to be moved vertically, or a support (such as a skid), or a holder (such as a box), for engaging and lifting the arti-

cle, body, support or holder, whether such elevating or projecting member is disposed above a portion of the truck frame or projects laterally therefrom, and whether or not the raising and lowering mechanism, or a portion thereof, is disposed below the member to be raised and lowered, or such elevating member is supported and guided at its inner end in guideways carried by the truck frame. In the illustrated form of construction I have shown a truck frame having vertical guides, preferably arranged intermediate the ends of the truck frame and slidably supporting the elevating member at its inner end so that it may be raised and lowered in carrying out the various operations for which these types of trucks are adapted.

1 indicates as an entirety the truck frame preferably comprising a main or elevated section 2 and a relatively low or sub-section 3. The main or elevated section 2 is preferably constructed as described and claimed in my co-pending application filed November 20, 1920, Serial No. 425,555, Patent No. 1,554,167. The inner or adjacent ends of the sections 2 and 3 are preferably connected by a pair of castings 4, each riveted to the adjacent frame members or sections in a well known manner. The relatively low section 3 preferably comprises pairs of longitudinally extending members 5, the elements of each pair being connected together in a well known manner. 6 indicates a pair of wheels disposed below and preferably within the sides of the main or elevated section 2. The wheels 6 are preferably pivoted to an axle (not shown), by means of knuckle joints, whereby they may be turned for steering purposes. 7 indicates a pair of wheels mounted on an axle (not shown), and co-operating with the wheels 6 to support the frame 1. Where the frame 1 includes a relatively low section 3, as shown in the drawings, the axle for the wheels 7 is connected to the low frame section to position the wheels outwardly of the frame toward the outer end of such section. The wheels 7 are preferably mounted to swing on a vertical axis or axes for steering pur-

poses, being connected by a suitable steering mechanism, including a link 8, to a rod 9 which is connected to the wheels 6 and a steering column 10, whereby all four wheels may be simultaneously operated. 12 indicates a motor for driving the wheels 6. The motor 12 is supported in a cradle 12^a, connected to the axle housing for the power transmitting mechanism (not shown), through which the power of the motor 12 is transmitted to the wheels 6. The axle housing and cradle 12^a are preferably supported by a suitable suspension mechanism. 14 indicates as an entirety a source of power supply, such supply in the illustrated form of construction comprising a suitable battery or batteries removably supported on the frame section 2 and arranged to supply current to the motor 12 and preferably enclosed in a suitable casing 14^a. 14^b indicates a controller interposed in and controlling the circuit for the motor 12 in a well known manner. 16 indicates a base or support on which the operative stands when operating the truck and 17 indicates a foot pedal operatively connected with a braking mechanism, the braking elements of which serve to stop the rotation of the motor shaft or the propeller shaft connected therewith and operate therethrough to stop or prevent movement of the truck.

18 indicates a pair of spaced vertical guide members preferably arranged intermediate the ends of the truck frame 1. The guide members 18 preferably comprise a pair of I-beams, the inner extending flanges of which serve as guides for shoes 19. The shoes 19 form a part of an elevating member 20, to which reference will later be made. 21 indicates bars connected at their inner ends to the beams 18 and connected at their outer ends to struts, which may be formed from angle bars 22, disposed at the front end of the elevated frame section 2 and supporting a dash 23 and depending plates 24. The plates 24 carry a pair of brackets 25. The brackets 25 are provided with hollow bosses to receive the opposite ends of a shaft or rod 25^a on which the base or platform 16 is swingably mounted to permit it to be swung upwardly, when not in use, being preferably counter-balanced by a weight 16^a. The channel bars 21 are preferably riveted at their inner ends to the I-beams 18, one flange of each of the latter being cut away so that the adjacent bar can be secured directly to the body portion of the beam.

25' indicates a pair of tie rods, each extending from the joint between the adjacent bar 21 and strut 22 to the upper end of the adjacent beam 18, being preferably secured to the latter by means of an end plate 26 extending laterally therefrom, as shown in Fig. 1.

The elevating member 20 comprises a shoe member 27 and a horizontally extending member 28 connected thereto. The shoe member 27 preferably comprises a pair of shoes 19, already referred to, connected together by a pair of spaced plates 29 and upper and lower shoe elements 30 carried by each shoe 19 and engaging the inner side walls of the adjacent beam 18. Each shoe element 30 consists of a roller loosely mounted on a stud shaft 31 supported in the wall of the adjacent shoe 19. The shafts 31 are inclined so that the circumferential surfaces of the rollers may engage the inclined inner surfaces of the side walls or flanges of the adjacent beam 18. As will be understood from Fig. 1, the stud shafts 31 carried by each shoe 19 are inclined at an angle relative to each other and are offset relative to the central longitudinal plane of the adjacent beam 18, so that the lower roller will engage its rear side wall or flange and the upper roller will engage its front side wall or flange. The horizontal member 28 preferably comprises a pair of spaced arms 28^a extending laterally relative to the shoe member 27 over the sub-section 3 and supporting a plate 28^b which may form a supporting means for the materials, goods, boxes or crates to be handled. Each of the arms 28^a is provided with a hinge element 28^c correlated with a hinge element at the lower end of the adjacent shoe 19, being connected thereto by a removable pivot pin 28^d which detachably connects the hinge elements of both arms to the shoe, this construction permitting the platform member to be readily connected at its inner end to the shoe member.

32 indicates as an entirety the hoisting or elevating mechanism for the elevating member 20. Of this mechanism, 33 indicates a motor, preferably of the electric type, arranged to be supplied with current from the source of supply 14 and operated by means of a controller 33'. 34 indicates a supporting member, to which the motor 33 is secured in a well known manner, preferably by cap screws 34^a. The lower portion of the supporting member 34 is shaped to form a housing 35 for power transmitting means. 36 indicates a shaft preferably of sectional character, which is driven by the power transmitting means. The sections of the shaft 36 extend laterally in opposite directions through the housing 35 and carry at their outer ends drums 37, 37', to which reference will later be made. 38 indicates a pair of spaced standards mounted on the elevated frame section 2, preferably near its rear end and substantially centrally thereof, and between the guide members 18 and battery housing 14^a, and serving as a supporting means for the power transmitting means, its supporting member 34 and the

motor 33. As shown, these standards are preferably arranged to support the motor 33 with its armature shaft in the central longitudinal plane of the truck frame 1 and with the drums 37, 37', at equal distances from and at the opposite sides of that plane. These standards 38 are preferably provided with front and rear feet, the former being bolted to the rear wall of the frame section 2, or an angle bar carried thereby, and the latter being secured to an angle bar 38^a extending transversely of the frame section 2. The upstanding wall of the bar 38^a may serve as a stop for the battery housing 14^a, as shown in Figs. 1 and 2. The power transmitting means preferably comprise a propellor shaft connected to the shaft 33^x of the motor 33 and carrying a worm meshing with a worm gear connected to or between a pair of members each keyed to one of the sections of the shaft 36. 39 indicates as an entirety a brake mechanism for stopping the motor 33 upon the shutting off of current thereto. Of this mechanism, 40 indicates a brake wheel fixed to the extended upper end of the motor shaft 33^x. 41 indicates a pair of brake shoes adapted to engage the brake wheel 40 and stop the motor shaft and through it prevent movement of the elevating member 20 in either direction from the position in which it may have been stopped. The brake shoes 41 are connected to a lever mechanism 42, which operates both shoes simultaneously to apply or release them, such mechanism being operated in the direction to apply the shoes by a spring 43. 44 indicates a solenoid, the winding of which is connected in series with the circuit to the motor 33. The core of the solenoid is connected to the lever mechanism 42 and is held by the latter in its extended or outer position, as shown in Fig. 1. Upon closing of the circuit to the motor 33, the solenoid winding is energized; thereupon the core is moved inwardly, which movement operates the lever mechanism 42, putting the spring 43 under tension and releasing the brake shoes 41. When the circuit to the motor is opened, the winding is de-energized, which permits the spring 43 to move the core and the lever mechanism 42 in the opposite direction and apply the brake shoes 41 to the wheel 40.

54 indicates a pair of channel bars connecting the upper ends of the guide members 18, being supported upon and secured to the brackets 26, each fixed to one of the guide members. 56 indicates hangers disposed between and secured to the channel bars 54. The hangers 56 are provided with suitable bearings 57 which support the opposite ends of a shaft 58. 59, 59', and 60, 60', indicate pairs of sheaves loosely mounted on the shaft 58 and arranged equal distances from a point midway between the

guide members 18. 61, 61', indicate a pair of sheaves loosely mounted on a shaft 61^a, supported at its opposite ends in the channel bars 54 and arranged at right angles to the shaft 58 with its axle in a plane substantially midway between the drums 37, 37'. 62, 62', and 63, 63', indicate pairs of sheaves loosely mounted on shafts 64, 65, respectively, preferably disposed at opposite sides of and substantially equal distances from the plane in which the shaft 61^a is supported and supported at their opposite ends in the plates 29. 66, 66', indicate ropes or other flexible members which run over and around the sheaves and are adapted to be wound on and from the drums 37, 37', to raise and lower the platform 20, together with whatever load is to be carried or transported or moved vertically thereby. The rope 66 extends from the drum 37 over the sheave 59, then around the sheave 62 and then over the sheave 61. From the sheave 61, the rope 66 runs around the sheave 63 and then around the sheave 60, its free end being connected to one end of an equalizing element 67, which is pivoted at 68 upon a plate 69 which forms one element of a take-up mechanism 70, the purpose of which is to take up slack occurring in the cables 66, 66', in the event the elevating member becomes wedged or meets with an obstruction when moving downwardly. The rope 66' extends from the drum 37' over the sheave 60', then around the sheave 63' and then over the sheave 61'. From the sheave 61' the rope 66' runs around the sheave 62' and then over around the sheave 59', its free end being connected to the opposite end of the equalizing element 67. The operation of winding the ropes on the drums 37, 37', and unwinding them therefrom to raise and lower the platform will be readily understood.

71 indicates a switch mechanism, preferably supported on one of the guides 18. The mechanism 71 comprises switches either of which is operated when the shaft 71^b is rocked in one direction. The shaft 71^b carries an arm 72 to which are pivotally connected the inner ends of rods 73, one extending upwardly and guided for endwise movement by the walls of an opening formed in a bracket 74 and the other extending downwardly and guided at its lower end for endwise movement by a bracket (not shown); the bracket 74 being carried by the rear flange of the adjacent I-beam 18 and the other bracket being carried by one of the elements of the frame. 75 indicates collars, preferably adjustably fixed to the rods 73 and adapted to be engaged by a striker or a projecting member carried by the elevated member 20, so that when the latter is moved in either direction, the striker, operating through one of the collars 75, will move the rods 73 and they in turn will open one of

the switches of the switch mechanism 71, and thus break the circuit to the motor 33. No claim is made herein to the switch mechanism 71 as it forms the subject-matter of Letters Patent No. 1,726,717, dated September 3, 1929.

76 indicates a mechanism interposed between the take-up mechanism 70 and the switch mechanism 71 and serving to operate the latter when the take-up mechanism is actuated. As the take-up mechanism and the switch operating mechanism associated with it is the invention of Amiel G. Hutzley, and forms the subjects-matter of a separate application Ser. No. 722,125, filed by him (see Letters Patent No. 1,690,681, dated Nov. 6, 1928), it is unnecessary to further describe the same herein.

In the operation of the truck the relatively low section thereof is adapted to be projected or driven under a load to be lifted, transported and discharged. Such load may consist of goods or commodities supported in an elevated position, or a box containing goods, or a skid with the goods thereon. For loads of a character that can be discharged by tilting the supporting means for the goods and permitting them to be slid off such supporting means, I utilize a dumping mechanism indicated as an entirety at 76'. The dumping mechanism 76' operates when the elevating member is moving vertically, preferably in the downward direction, it co-acting with the raising and lowering means as it moves the elevating member to tilt the supporting means by holding one end thereof and permitting its opposite end to pivot on the elevating member as it remains supported thereon.

In the form of construction shown in Figs. 1 and 2, the supporting means constitutes a box A into which the goods to be transported and dumped are placed. The box comprises a bottom a , sides a' and a front end wall a^2 . The rear end is preferably open, but where it is provided with an end wall, such wall is constructed to form a gate to permit dumping. C indicates an engaging element preferably carried on the outer face of the end wall a^2 . The engaging element may comprise a rod extending transversely of the box A and supported at its opposite ends by arms a^3 fixed to the wall a^2 in any desired manner. The rod C extends laterally beyond the sides a of the box A for a purpose which will later appear.

Of the dumping mechanism 76', 77 indicates a shaft supported by the frame 1. Where the invention is applied to an elevating type of truck having vertical guides, such as shown in Figs. 1 and 2, the shaft 77 is supported by and extends transversely of the guides. In the illustrated form of construction, the brackets 26 support standards 78 that are shaped to provide bearings

78^a for the shaft 77 and thus support the shaft at the extreme upper end of the guides 18. 79 indicates an arm fixed to the shaft 77 and depending therefrom since the shaft is supported at the upper ends of the guides. The arm 79 is fixed to the shaft 77 on that side of the adjacent I-beam opposite to the side with which the guide shoe 19 engages, although I do not wish to be limited to this arrangement. As the shoes 19 are shown in Figs. 1 and 2 as engaging the inner sides of the I-beams, the arm is arranged on the outer side thereof, the object being to avoid interference between the arm and elements of the raising and lowering mechanism or elevating member. 80 indicates an engaging element, such as a hook carried by the arm 79 (preferably at its free end), arranged to engage the supporting means as the elevating member 20 moves vertically. As shown, the hook 80 extends laterally so that it can hook on to the rod C. 81 indicates a spring preferably connected at one end to the adjacent tie-rod 25' and at its opposite end to the arm 79 and normally tending to swing it into an inoperative position, that is, in a position inwardly of the guides 18—see dotted lines in Fig. 1—and out of the path of movement of the rod C. 82 indicates a means for swinging the arm 79 to move the hook 80 into operative position (see full lines in Fig. 1). The means 82 preferably comprise a thrust member pivotally connected at its inner end to arm 79 and extending outwardly to a point within reach of the operative standing on the base 16. The outer end of the thrust member 82 may be guided by the walls of an opening formed in a plate 83 secured to and projecting from the adjacent tie-rod 25' and its free end may be bent laterally, as shown at 82^a, to form a handle. By preference, the shaft 77 extends at its opposite ends beyond the guides 18 and carries two arms 79, each carrying a hook 80, so as to engage the supporting means A at its opposite sides to avoid any tendency of tilting the latter sideways.

In the operation of the dumping means 76': Fig. 1 shows the truck positioned with its elevating member 20 below a box A. The elevating member is then raised to clear the feet of the box from the floor and the truck driven to the place of discharge. The elevating member 20 is elevated until the arm C of the supporting means or box A is above the plane of the hooks 80; then the rod 82 is moved to swing the arms 79 outwardly to the position shown in Fig. 1; and then the direction of movement of the raising and lowering mechanism is reversed. As the elevating member descends, the rod C will engage the hooks 80 and be held thereby. As the elevating member 20 continues its downward movement, the box C

will assume an inclined position as shown in dotted lines in Fig. 1 and thus cause its contents to be discharged. The elevating member 20 is again raised and the hooks 80 released from the arm C, after which the elevating member may be lowered.

In Figs. 3 and 4 I have illustrated my invention in connection with a supporting means such as a skid A' which may be of standard size or of any preferred form of construction. Where a skid A' is used for the goods to be transported and discharged, I prefer to provide one or both ends with a projection, such as an angle bar 20^a to insure a locking engagement between the hooks 80 and skid A'.

In operating the dumping mechanism 76', it will be seen that when the hooks engage the supporting means (box A or skid A') the latter is held against outward or endwise movement so that it cannot slide off the outer end of the elevating member 20 when it is tilted. This is particularly advantageous since in most instances the rear end of this box or skid extends beyond the elevating member and would readily slide endwise if it were not held by the dumping mechanism 76'.

In Figs. 5 and 6 I have illustrated my invention in connection with a truck wherein the supporting means comprises a plate 28^b pivoted at its outer portion on the elevating member 20, so that it may be tilted relative to the elevating member 20 to discharge the goods thereon by being held at its inner end at or during the time the elevating member moves downwardly. In this form of construction I prefer to pivot the rear end or portion of the plate 28^b on the outer ends of the arms 28^a, these arms being provided with knuckles and the side walls of the plate being provided with hollow bosses to receive the opposite ends of a rod 84, which forms the pintle for such pivotal connection.

When the plate 28^b is pivotally connected to the elevating member, the arms 79 are preferably arranged at points between the side edges thereof and in this form of construction the inner end of the plate 28^b is formed with cut-aways 85 to receive the arms 79 as the elevating member 20 is operated, 86 indicated rods secured to the under side of the plate 28^b by straps 87 and straddling the cut-aways 85, so that the hooks 80 may engage therewith to tilt or swing the plate 28^b as the elevating member moves downwardly, as shown in Fig. 5.

In Fig. 7 I have shown a modification of the construction shown in Figs 5 and 6, wherein the shoes for the elevating member 20 are disposed on the outer sides of the guides 18 and the dumping arms 79 are disposed between the guides. In this form of construction I prefer to operate the arms 79 to their in-operative positions by a spring

88 coiled around the arm supporting shaft and fixed thereto at one end and to the adjacent supporting standard for the shaft at its opposite end.

To those skilled in the art to which my invention relates, many modifications and embodiments of the invention and applications thereof will suggest themselves without departing from the spirit and scope thereof. The description and the disclosure herein are purely illustrative and are not intended to be in any sense limiting.

The suspension mechanism shown herein forms the subject-matter of an application jointly filed by John H. Hertner and myself—see Letters Patent No. 1,628,145—for which reason no claim is made herein to such mechanism.

What I claim is:

1. In apparatus of the class described, the combination of a truck frame, wheels for the frame, an elevating member movably mounted on said frame and having a horizontal position adapted to support a supporting means during its movement, means for raising and lowering said elevating member, an arm swingably mounted on said frame and provided with an element movable into and out of the path of movement of the supporting means, whereby said element when in one position engages one end of the supporting means to tilt the latter relative to said elevating member as said member moves in one direction.

2. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of vertical guides on said frame, an elevating member slidably supported at one end on said guides, an arm swingably supported on said frame and provided with an element arranged to engage a supporting means on said elevating member as the latter moves vertically to tilt said supporting means.

3. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of vertical guides on said frame, an elevating member slidably supported at one end on said guides, an arm swingably supported on said frame and provided with an element arranged to engage a supporting means on said elevating member as the latter moves vertically to tilt said supporting means, and a thrust member extending to the driving end of said frame for operating said arm.

4. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of vertical guides on said frame, an elevating member slidably supported at one end on said guides, an arm swingably supported on said frame and provided with an element arranged to engage a supporting means on said elevating member as the latter moves vertically

to tilt said supporting means, a thrust member extending to the driving end of said frame for operating said arm, and a spring normally tending to hold said arm in an inoperative position.

5 5. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of guides supported vertically on said frame, an elevating member slidably supported by said guides, means for raising and lowering said member, a shaft mounted on said frame, an arm secured to said shaft, an engaging element carried by said arm, said arm being swingable outwardly to position said element in the path of movement of a portion of a supporting means on said member, and means for operating said arm in one direction.

20 6. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of guides supported vertically on said frame, an elevating member having shoes each slidably engaging one side of the adjacent guide, means for raising and lowering said member, a shaft mounted on said guides, a pair of arms secured to said shaft on the opposite sides of said guides from said shoes, engaging elements carried by said arms, said arms being swingable outwardly to position said elements in the path of movement of a portion of a supporting means on said member, and means for operating said arms in one direction.

35 7. In apparatus of the class described, the combination of a truck frame, wheels for the frame, an elevating member movably mounted on said frame, means for raising and lowering said elevating member, a supporting means pivotally connected at its outer end on said elevating member, an arm swingably mounted on said frame and provided with an element arranged to engage the inner end of said supporting means as said elevating member moves vertically to tilt said means, and means for moving said arm in one direction.

40 8. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of vertical guides on said frame, an elevating member slidably supported at one end on said guides, a load carrying device pivotally connected at its outer end on said elevating member, and an arm swingably supported on said guides and provided with an element arranged to engage the inner end of said device as said elevating member moves vertically to tilt said device.

60 9. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of vertical guides on said frame, an elevating member slidably supported at one end on said guides,

a load carrying device pivotally connected at its outer end on said elevating member, an arm swingably supported on said guides and provided with an element arranged to engage the inner end of said device as said elevating member moves vertically to tilt said device, and a thrust member extending to the driving end of said frame for operating said arm.

10. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of vertical guides on said frame, an elevating member slidably supported at one end on said guides, a load carrying device pivotally connected at its outer end on said elevating member, an arm swingably supported on said guides and provided with an element arranged to engage the inner end of said device as said elevating member moves vertically to tilt said device, a thrust member for operating said arm, and a spring normally tending to hold said arm in one position.

11. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of guides supported vertically on said frame, an elevating member having shoes slidably engaging said guides, means for raising and lowering said member, a load carrying device pivotally mounted at its outer end on said elevating member, a shaft mounted on said guides, a pair of arms secured to said shaft and swingable outwardly into the path of movement of the inner end of said device and carrying engaging elements, and means for operating said arms to position their engaging elements in the path of movement of said device.

12. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of guides supported vertically on said frame, an elevating member having shoes each slidably engaging one side of the adjacent guide, means for raising and lowering said member, a load carrying device pivotally mounted at its outer portion on said elevating member, a shaft mounted on said guides, a pair of arms secured to said shaft on the opposite sides of said guides from said shoes and swingable outwardly into the path of movement of said device and carrying engaging elements to engage therewith, and means for operating said arms to move their engaging elements into operative position.

13. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of guides supported vertically on said frame, an elevating member having shoes slidably engaging the inner sides of said guides, means for raising and lowering said member, a load carrying device pivoted at its outer portion on said elevating member, a shaft

mounted on said guides, an arm secured to said shaft on the outer side of one of said guides and swingable outwardly and carrying an engaging element, and means for operating said arm to move its engaging element into operative position to engage the inner end of said device as said elevating member moves downwardly.

14. In apparatus of the class described, the combination of a truck frame, wheels for supporting said frame, a pair of guides supported vertically on said frame, an elevating member slidably supported at its inner end on said guides, means for raising and lowering said member, a load carrying device pivoted at its outer end on said elevating member, a shaft mounted on said guides, a pair of arms secured to said shaft and swingable outwardly and carrying engaging elements, devices on the inner end of said device with which said elements engage, and means normally operating to hold said arms in an inoperative position.

15. In apparatus of the class described, the combination of a frame, wheels for supporting said frame, a guide on said frame, an elevating member movably mounted on said guide and adapted to support a load carrying means, means for raising and lowering said elevating member, a shaft on said guide, a pair of arms depending from said shaft and carrying at their outer ends engaging elements, means for swinging said arms in one direction to position said elements in a transverse plane beyond the inner end of the load carrying means to hold said end while its outer end moves downwardly with said elevating member, and separate means for moving the arms in the opposite direction.

16. In apparatus of the class described, the combination of a frame, wheels for supporting said frame, a guide on said frame, an elevating member movably mounted on said guide and arranged to be projected below a load to be transported, means for raising and lowering said elevating member, and means carried by said guide and arranged intermediate the limits of vertical travel of said elevating member and movable to a position below the load, whereby said means may co-operate with said raising and lowering means as said elevating member moves downwardly to discharge the load carried thereby.

17. In apparatus of the class described, the combination of a frame, wheels for supporting said frame, a guide on said frame, an elevating member movably mounted on said guide, means for raising and lowering said elevating member, a load carrying device supported by said elevating member and pivotally connected at its outer portion thereto, and means carried by said guide and arranged intermediate the limits of ver-

tical travel of said elevating member and movable into a position to engage the inner end of said device, whereby said means may co-operate with said raising and lowering means as said elevating member moves downwardly to tilt said device into an inclined position relative to said elevating member to effect a discharge of the goods on said device.

18. In apparatus of the class described, the combination of a frame, wheels for supporting said frame, a guide on said frame, an elevating member movably mounted on said guide, means for raising and lowering said elevating member, a load carrying device supported by said elevating member and pivotally connected at its outer portion thereto, means carried by said guide and arranged intermediate the limits of vertical travel of said elevating member and movable into a position to engage the inner end of said device, whereby said means may co-operate with said raising and lowering means as said elevating member moves downwardly to tilt said device into an inclined position to effect a discharge of the goods thereon, and means for operating said tilting means.

19. A vehicle having means for elevating its body and dumping the same, said elevating and dumping means comprising a single elevating mechanism adapted to raise and lower the entire body, the body being tiltable with relation to said mechanism, and said vehicle having a device to engage a portion of said body after the latter is elevated and hold it elevated while said mechanism is lowering the remainder thereof, and means for disengaging said device and body to permit lowering of the entire body after dumping.

20. A vehicle having means for elevating its body and dumping the same, said elevating and dumping means comprising a single elevating mechanism adapted to raise and lower the entire body, the body being tiltable with relation to said mechanism and said vehicle having a device to engage a portion of said body after the latter is elevated and hold it elevated while said mechanism is lowering the remainder thereof, and said device being movable to operative or inoperative positions whereby with a single elevating mechanism the vehicle may be used as a dumping truck or an elevator truck at the will of the operator.

21. A vehicle having means for elevating its body and dumping the same, said elevating and dumping means comprising a single elevating mechanism, a separate body, and said elevating mechanism being adapted to be engaged by said body and be disengaged therefrom, so that the entire body when engaged may be raised and lowered by said mechanism, and the vehicle having a

device to engage a part of said body after the latter is elevated and hold it elevated while the elevating mechanism is lowering the remainder thereof, whereby the elevating mechanism is used as a tilting means for
5 dumping loads from the body, and said engaging device being movable at the will of the user to engaging or disengaging position, so that the vehicle may be used as a
10 dumping truck or an elevator truck.

22. A vehicle having means for elevating its body and dumping the same, said elevating and dumping means comprising a single elevating mechanism adapted to raise and
15 lower the entire body, the body being tiltable with relation to said mechanism and said vehicle having a device which is adapted to remain in a substantially fixed position with relation to the vehicle, said
20 device being adapted to be automatically engaged by the vehicle body after the latter has been elevated above it and lowered to the engaging point, and said device being adapted to maintain one end of the body in
25 elevated position when said elevating mechanism is lowered to depress the remainder of the body whereby with a single elevating mechanism the vehicle may be used as a dumping truck or elevator truck at the will
30 of the operator.

23. A self-propelled truck comprising an elevator and a detachable body, said body having supports for holding it high enough for the platform of the elevator in its lowered position to pass beneath said body, and
35 means for pivotally supporting said body on a fixed part of said truck, said body also being supported by said elevator, said body being tiltable to dump the contents by movement of said elevator, said pivotal supporting means being located in a position above
40 the lower position of said elevator, said elevator being adapted to raise said body to a position to engage said pivotal supporting means.
45

24. A combination according to claim 20 in which the device for engaging the vehicle body comprises a part movable into and out of the vertical path of travel of said
50 body, whereby said body may be raised above said supporting means without interference, the said supporting means being then movable into the path of movement of said body to engage said body when
55 lowered.

25. A combination according to claim 23 in which said pivotal supporting means comprises a part movable into and out of the vertical path of travel of said body, whereby
60 said body may be raised above said supporting means without interference, the said supporting means being then movable into the path of movement of said body to engage said body when lowered.

65 26. A combination according to claim 20

in which the device for engaging the vehicle body comprises a part movable into and out of the vertical path of travel of said body, means normally holding said supporting means out of said path of travel, whereby said body may be raised above said supporting means without interference, the said supporting means being then movable into the path of movement of said body to engage said body when lowered.

27. A combination according to claim 23 in which said pivotal supporting means comprises a part movable into and out of the vertical path of travel of said body, means normally holding said supporting means out of said path of travel, whereby said body may be raised above said supporting means without interference, the said supporting means being then movable into the path of movement of said body to engage said body when lowered.

In testimony whereof, I have hereunto subscribed my name.

EDWARD H. REMDE.