April 16, 1935. T. C. HARVEY 1,998,317

DUMP WAGON

Original Filed Feb. 8, 1933 4 Sheets-Sheet 1

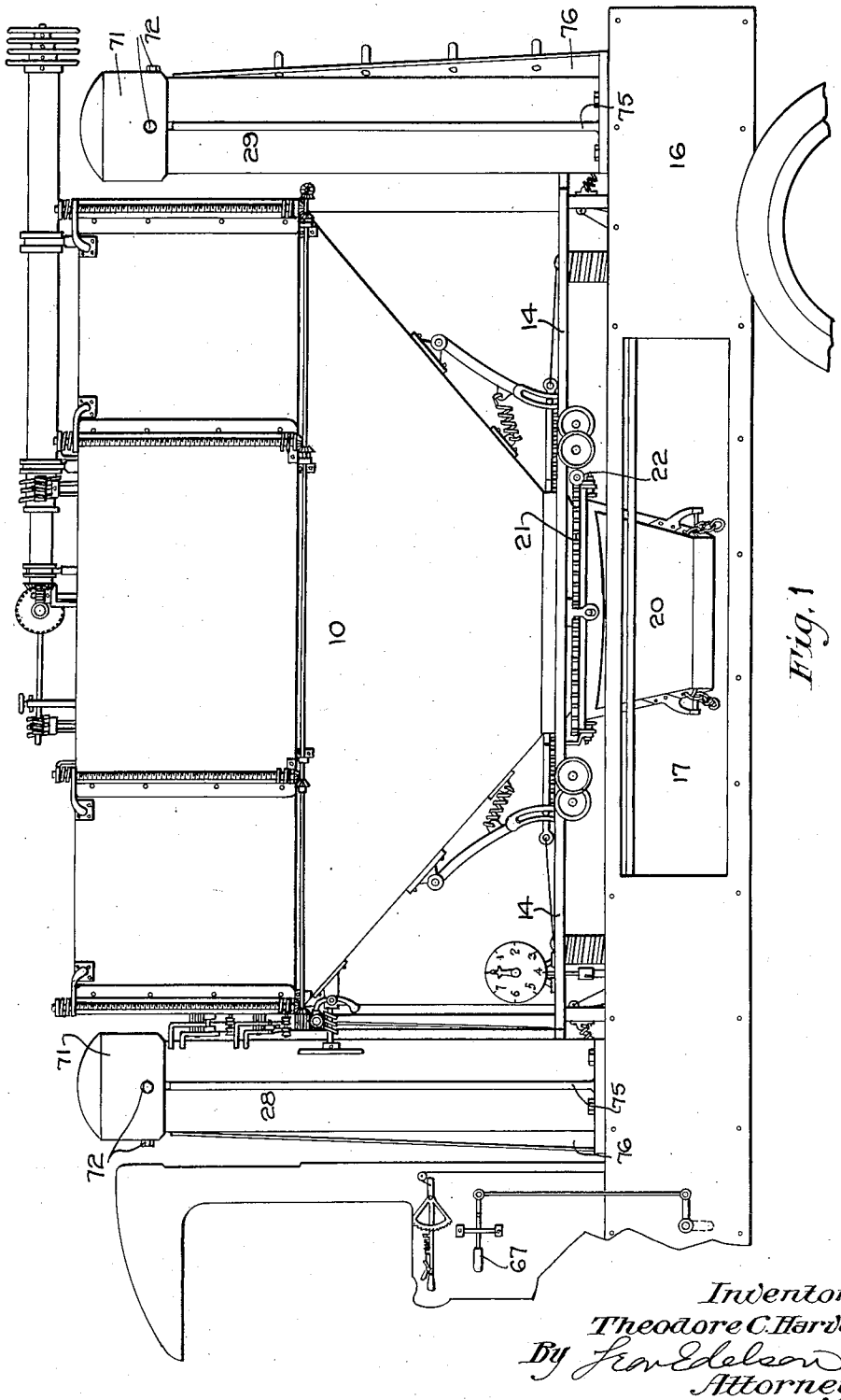


Fig. 1

Inventor:
Theodore C. Harvey,
By Fran Edelson
Attorney.

April 16, 1935. T. C. HARVEY 1,998,317

DUMP WAGON

Original Filed Feb. 8, 1933 4 Sheets-Sheet 2

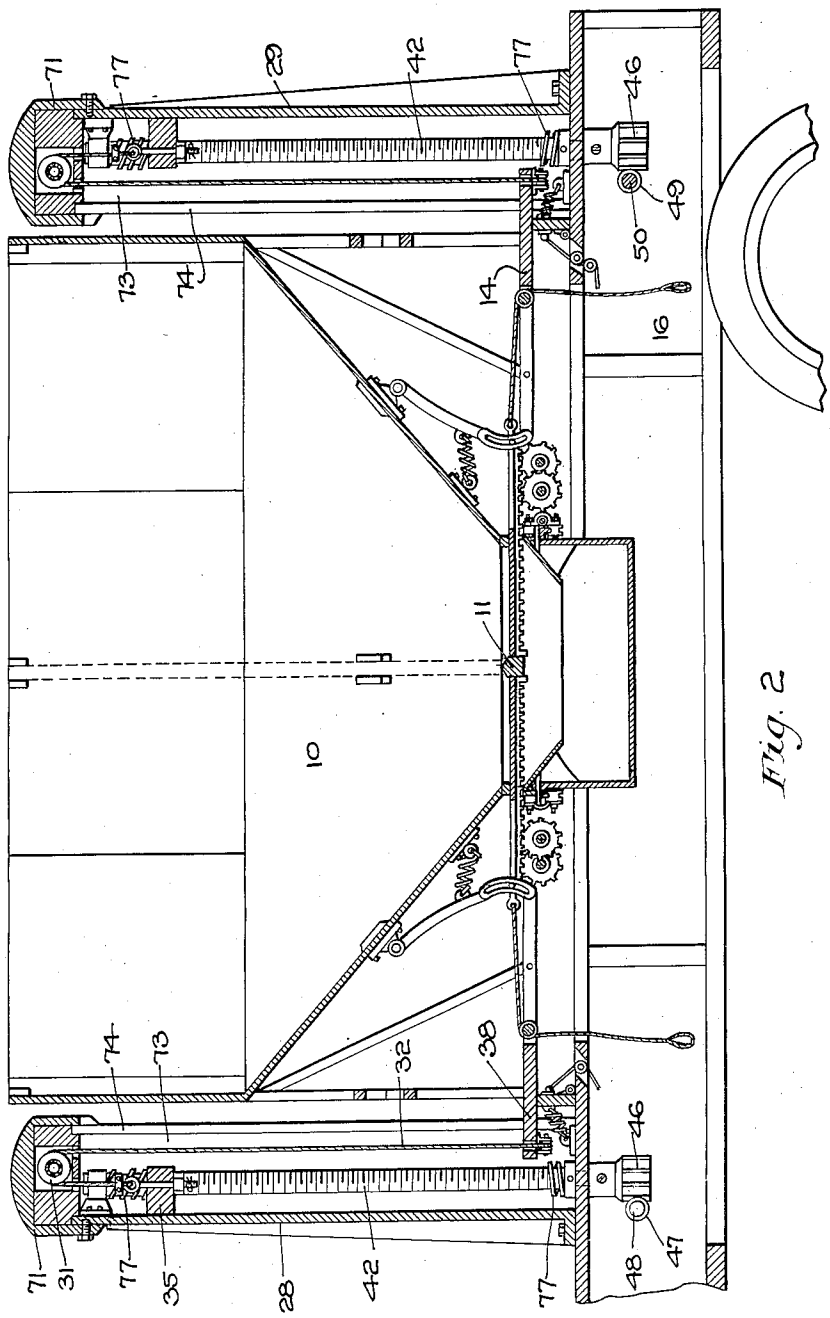


Fig. 2

Inventor:
Theodore C. Harvey,
By Lowe Delson
Attorney.

April 16, 1935. T. C. HARVEY 1,998,317

DUMP WAGON

Original Filed Feb. 8, 1933 4 Sheets-Sheet 3

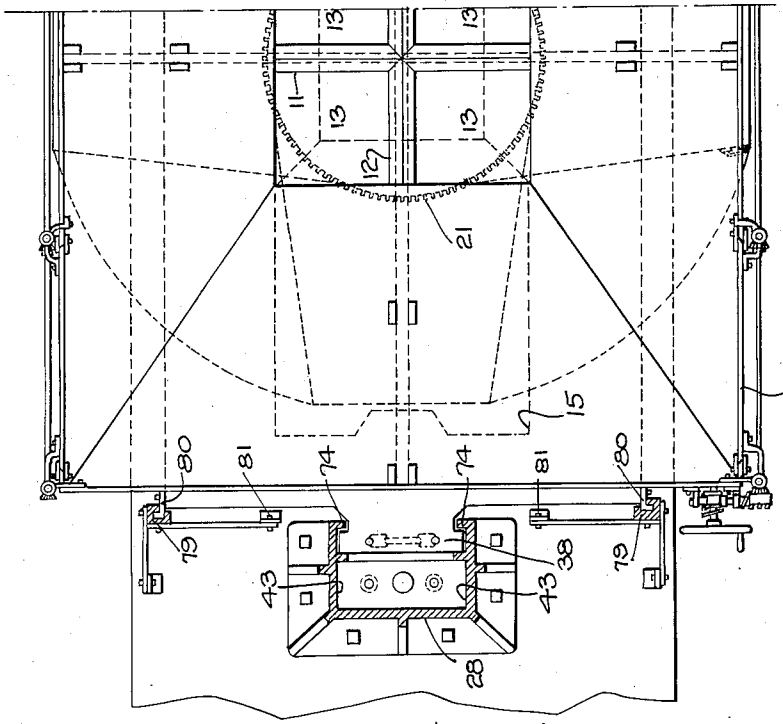


Fig. 4

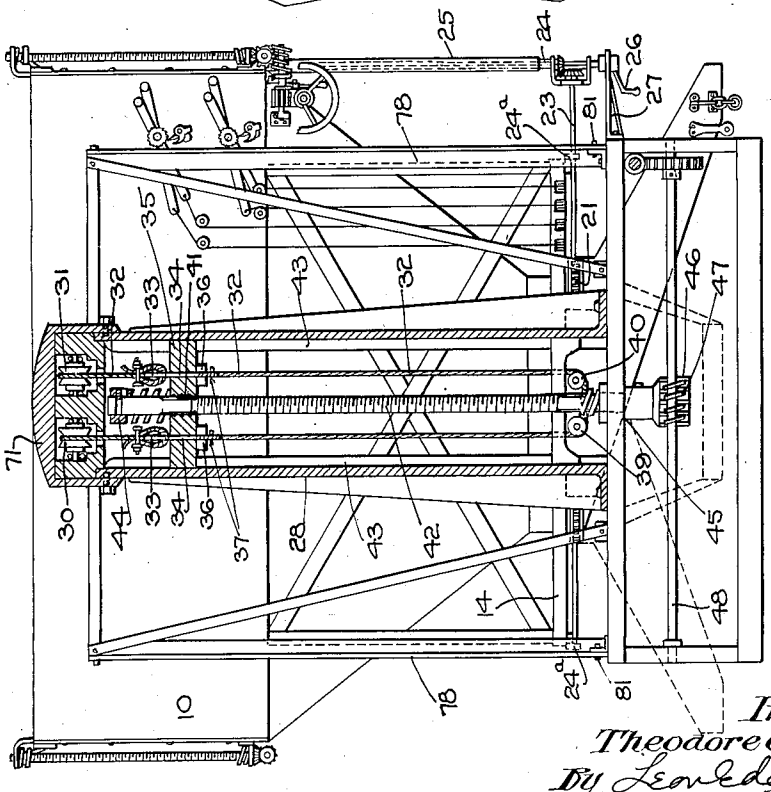


Fig. 3

Inventor:
Theodore C. Harvey,
By Lee Edelson
Attorney.

April 16, 1935. T. C. HARVEY 1,998,317

DUMP WAGON

Original Filed Feb. 8, 1933 4 Sheets-Sheet 4

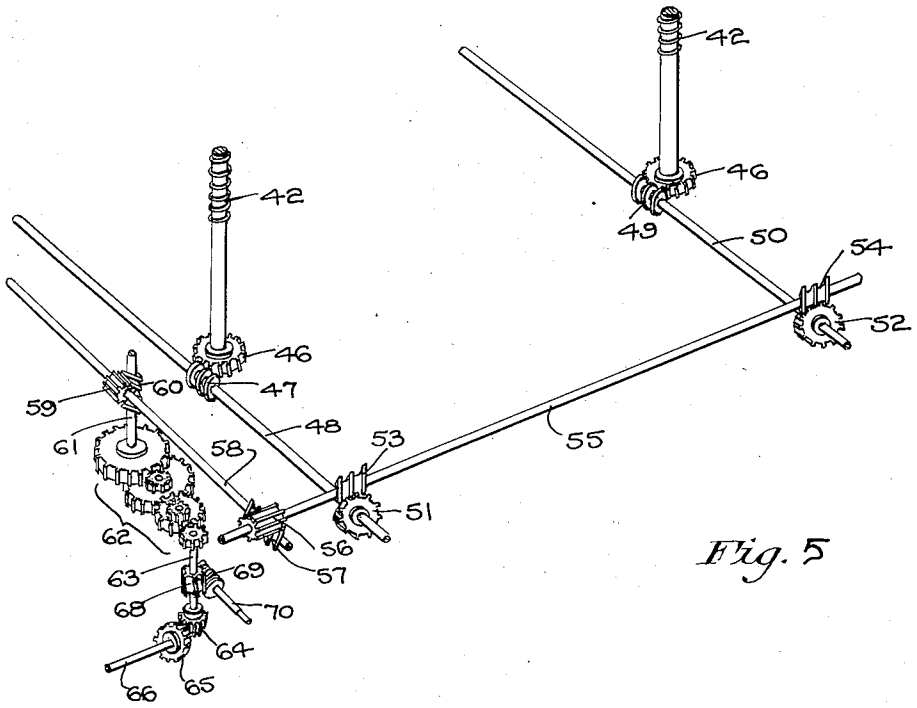


Fig. 5

Inventor:
Theodore C. Harvey,
By Jean Edelson
Attorney.

Patented Apr. 16, 1935 1,998,317

UNITED STATES PATENT OFFICE

1,998,317

DUMP WAGON

Theodore C. Harvey, Philadelphia, Pa.

Original application February 8, 1933, Serial No. 655,744. Divided and this application October 14, 1933, Serial No. 693,546

7 Claims. (Cl. 187—9)

This is a divisional application of a copending application filed February 8, 1933, Serial No. 655,744.

This invention relates to dump wagons, the broad object of said invention being to provide a wagon of the class described, which is capable of various operations in order to expedite and facilitate the discharge of the load therefrom in a manner most convenient to the operator as well as minimizing traffic obstruction.

Another object in view, is to provide in connection with a body having the characteristics above referred to, means for vertically raising and lowering the body in relation to the truck frame, without interfering with the discharge of the load. The body is adapted to be raised either by hand or motive power.

With the above and other objects in view, the invention consists substantially in the combination, construction, location and relative arrangement of parts, all as will appear more fully hereinafter, as shown in the accompanying drawings and as finally pointed out in the appended claims.

In the accompanying drawings:—

Fig. 1 is a side elevational view of a dump wagon constructed in accordance with and embodying the principles of the present invention;

Fig. 2 is a vertical, longitudinal section through the dump wagon;

Fig. 3 is a front end elevational view of the dump wagon showing the truck body or double platform arrangement, skeleton body supports, load doors and outlet controls and revolving chute discharge outlet, the forward body elevating standard being shown in cross section;

Fig. 4 is a partial plan view of the dump wagon embodying the present invention, the forward elevating standard being shown in horizontal section; and

Fig. 5 is a perspective view of part of the hand and motor controlled means for raising and lowering the body of the dump wagon.

As appears most clearly in Figure 1, the main body 10 rests upon and is directly supported by a foundation board or platform 14 having formed therein an elongated central opening 15. This platform 14 is adapted for vertical movement together with the main body 10 supported thereby by means to be described hereinafter. The platform 14 is, of course, disposed in a substantially horizontal plane above the vehicle frame 16. The fore and aft ends of the vehicle frame side members are preferably in the form of partially boxed-in sections the vertical side walls of which are each provided with a centrally disposed opening 17.

Mounted upon the upper frame member 16 of the vehicle truck at the fore and aft ends thereof are a pair of uprights or standards 28 and 29. Inasmuch as these standards and their associated parts are substantially alike, only one of them will be described in detail, it being observed, as in Figure 3, that each of said standards has journalled in the upper end thereof a pair of pulleys 30 and 31, these pulleys being arranged for rotation about a common horizontally extending axis. Referring now more particularly to the forward standard 28, as shown in Figures 2 and 3, it will be observed that the pulleys 30 and 31 are traversed by a flexible cable 32 which is employed for raising and lowering the main body 10. The free ends of this cable 32 are respectively attached to the eyes 33 formed in the upper ends of a pair of bolts 34 the shanks of which project downwardly through a vertically movable cross piece or block 35, the freely projecting ends of the bolts being respectively provided with nuts 36 threaded thereon. Preferably, these nuts 36 are retained against displacement by cotter pins 37 which pass through apertures suitably provided in the shanks of the bolts.

The two portions of the cable 32 which respectively pass over the pulleys 30 and 31 extend downwardly through suitable apertures provided in the end extension 38 (see Figures 2 and 4) of the foundation board or platform 14, the looped or bight end of the cable being then passed around a pair of pulleys 39 and 40 suitably journalled beneath the said foundation board or platform 14, the pulleys 39 and 40 being respectively arranged for rotation about axes which parallel each other and extend at right angles to the axis of rotation of the pulleys 30 and 31. This arrangement equalizes the strain imposed upon each end of the doubled cable 32. It will be observed that the threaded ends of the bolts 34 project downwardly beyond the cross block 35 a sufficient distance to permit adjustment of the nuts 36 thereon and that by so adjusting these nuts upon their respective bolts the tension upon the cable 32 may be varied as desired at the same time that the foundation board or platform 14 may be leveled with respect to the horizontal plane.

As appears most clearly in Figure 3, the cable block 35 is centrally provided with a threaded aperture 41 through which is threadedly projected a vertically arranged screw 42. The opposite ends of the cross block 35 are respectively accommodated within guide channels 43 formed in the side walls of the upright or standard 28. The upper end of the screw 42 is rotatably journalled within a bearing 44 suitably supported within the upper end of the standard 28. The lower end of the screw 42 is in turn journalled, as at 45, in the vehicle frame member 16, said lower end of the screw 42 being provided with a downward extension carrying a worm gear 46.

The worm gear 46 of the forward screw 42 is adapted for meshing engagement with a worm 47

which is fixed to a transversely extending shaft 48 the opposite ends of which are suitably journalled in the side walls of the vehicle frame. The worm gear 46 of the rear screw 42 is similarly adapted for meshing engagement with a worm 49 which is fixed to a similarly journalled cross shaft 50, the cross shafts 48 and 50 being arranged for rotation in a common plane disposed substantially midway between the top and bottom edges of the vehicle frame member 16. Respectively secured to corresponding ends of each of the cross shafts 48 and 50 are the gears 51 and 52 (see Figures 3 and 5), the latter gears being respectively in mesh with the worms 53 and 54 commonly carried by a countershaft 55 extending longitudinally above the vehicle frame member 16. Secured to this countershaft 55 adjacent the forward end thereof is a worm gear 56 adapted for meshing engagement with a worm 57 fixed to, for rotation with, a transversely extending shaft 58 to which is secured, preferably intermediately to the ends thereof, a worm gear 59. This latter worm gear 59 is driven by a worm 60 carried by a vertically arranged shaft 61, the lower end of the latter being geared through a chain of meshed gears 62, to a laterally disposed vertical shaft 63, the lower end of which is provided with a bevel gear 64 adapted for meshing engagement with a beveled gear 65 fixed to the end of a longitudinally extending drive shaft 66 adapted for control by a clutch and gear unit (not shown), the operating lever 67 (see Figure 1) of which is situated by the operator's seat. The drive shaft 66 is adapted to be driven by gears (not shown) suitably connected to a driving motor on the vehicle frame.

From the foregoing, it will be apparent that when it is desired to raise or lower the main body 10 this may be readily accomplished by effecting the rotation in one direction or the other of the drive shaft 66 which will, through the gear arrangements just described, effect the rotation of the longitudinally extending countershaft 55 which in turn, through the cross shafts 48 and 50 and their associated gears, will effect the rotation of the fore and aft screws 42—42 in unison in consequence of which the cross blocks 35—35 will be commonly raised or lowered to correspondingly lower or raise the foundation board or platform 14, the latter being suspended between the looped ends of the cables 32—32.

If desired, the raising or lowering of the foundation board or platform 14 may be effected by hand instead of by the motor (not shown) on the vehicle frame and to this end the vertically extending shaft 63 may be provided with an auxiliary worm gear 68 which is adapted for meshing engagement with a worm 69 fixed to and carried by a laterally projecting shaft 70 the free end of which is formed for connection with a crank handle, any suitable means being employed for maintaining the body 10 in vertically adjusted position, such as a ratchet carried by the laterally projecting shaft 70 for engagement with a pawl or detent (not shown). This alternative arrangement for raising or lowering the body 10 by hand facilitates such operation when the operator is standing on the ground beside the vehicle.

Preferably, the upper ends of the fore and aft standards 28 and 29 are respectively covered by the caps 71 retained in position by means of the screw bolts 72. These standards 28 and 29 are respectively slotted, as 73, in the faces thereof which present toward each other in order to permit the free vertical movement of the substantially T-shaped extensions 38 provided at either end of the foundation board or platform 14, these extensions being retained within the standards 28 and 29 and guided during the vertical movement of the platform by the vertically extending ribs 74 which define the vertically extending slots 73 in the standards. Preferably, the standards are each strengthened and supported by braces or ribs 75 and 76 (see Figures 1 and 4).

Referring again to the elevation standards 28 and 29, it will be observed that the vertical lift screws 42 are each provided at their upper and lower ends with smooth-surfaced or non-threaded portions, these portions being slightly tapered and accommodating coiled springs 77. These springs 77 operate to serve as safety devices in limiting the vertical movement of the body in either direction. Thus, should the actuating power not be cut off when the body reaches its lowermost or uppermost position, the smooth-surfaced portions of the screws continue to rotate freely within the cable blocks 35 without, however, effecting any further movement of the latter in one direction or the other. When the power is reversed, however, the springs 77 are operative instantly to force the blocks 35 into threaded engagement with the screw 42 whereupon further rotation of the screws will cause the blocks 35 to travel axially thereof to either raise or lower the body as the case may be.

In addition to the supports for the main body 10 which have hereinbefore been described, this body is further supported by crib work 78 shown most clearly in Figures 3 and 4, the corner posts 79 of which are suitably ribbed or grooved to constitute vertical guides for the corner lugs 80 (see Figure 4) fastened to each corner of the foundation board or platform 14. The crib work for supporting and guiding the foundation board or platform 14 during its upward and downward movement is suitably and rigidly founded upon the vehicle frame member 16 by bolts or rivets 81.

The body is self-emptying either in its elevated or lowered position, it being apparent that the entire body may be readily raised or lowered either by hand or by motor without spilling any of the load. Also, by virtue of the arrangement of the supporting crib work for the body and within which the foundation board is guided in its vertical movement, it is not possible for the body to drop from an elevated position unless the lifting cables at opposite ends of the vehicle break simultaneously.

It will be understood, of course, that the invention is susceptible of various changes and modifications which may be made from time to time without departing from the real spirit or general principles thereof and it is accordingly intended to claim the same broadly, as well as specifically, as indicated in the appended claims.

What is claimed as new and useful is:—

1. In a vehicle of the character described, in combination, a main vehicle frame, a pair of vertically extending standards arranged respectively at the fore and aft ends of said frame, said standards being of substantially channel cross-section and arranged with the mouths thereof presenting toward each other, a horizontally disposed platform for supporting a load receiving body, said platform being provided at the opposite ends thereof with extensions respectively adapted for accommodation within said channeled standards, said platform being adapted for vertical move-

ment with respect to said vehicle frame, said channel posts constituting guides for said platform during said vertical movement thereof, a vertically extending screw rotatably journalled in said vehicle frame and extending upwardly within each of said channeled standards, a movable block in threaded engagement with said screw and adapted to travel vertically within each of said standards upon rotation of said screw, cable means respectively interconnecting each of said vertically movable blocks with the opposite extensions of said platform, and gear means for actuating said screws in unison whereby to effect the raising or lowering of said platform.

2. In a vehicle of the character described, in combination, a main vehicle frame, a pair of vertically extending standards arranged respectively at the fore and aft ends of said frame, said standards being of substantially channel cross-section and arranged with the mouths thereof presenting toward each other, a horizontally disposed platform for supporting a load receiving body, said platform being provided at the opposite ends thereof with extensions respectively adapted for accommodation within said channeled standards, said platform being adapted for vertical movement with respect to said vehicle frame, said channel posts constituting guides for said platform during said vertical movement thereof, a vertically extending screw rotatably journalled in said vehicle frame and extending upwardly within each of said channeled standards, a movable block in threaded engagement with said screw and adapted to travel vertically within each of said standards upon rotation of said screw, cable means respectively interconnecting each of said vertically movable blocks with the opposite extensions of said platform, the opposite extremities of each of said vertically extending screws being provided with smooth surfaces, coil springs respectively embracing the smooth surfaces of said screws for absorbing the shock of the cross blocks as they reach the limit of their movement in one direction or the other and for automatically effecting the threaded engagement of said cross blocks with the threaded portion of said screw when the operation of the screw is reversed, and gear means for actuating said screws in unison whereby to effect the raising or lowering of said platform.

3. In a vehicle of the character described, in combination, a main vehicle frame, a pair of vertically extending standards arranged respectively at the fore and aft ends of said frame, a vertically disposed screw located within each of said standards, a cable block axially movable with respect to said screw upon rotation of the latter in one direction or the other, a platform for supporting a load receiving body arranged above said vehicle frame, the fore and aft ends of said platform being suspended by cables respectively connected to said cable block and passing over pulleys mounted in the top of each standard, and means in said standards respectively constituting guides for the fore and aft ends of said platform.

4. In a vehicle of the character described, in combination, a main vehicle frame, a pair of vertically extending standards of substantially channeled cross section arranged respectively at the fore and aft ends of said frame with the mouths of said channels presenting toward each other, a horizontally disposed platform for supporting a load receiving body, said platform being provided at opposite ends thereof with guide extensions adapted respectively for reception within the mouths of said channels, elevating screws respectively provided within each of said standards, a cable block operatively associated with each screw, cable means interconnecting each cable block with one of said extensions of the platform whereby upon rotation of the screws in one direction or another the platform is raised or lowered, and means provided in each cable block for adjusting the effective length of each cable.

5. In a vehicle of the character described, in combination, a main vehicle frame, a pair of vertically extending standards of substantially channeled cross section arranged respectively at the fore and aft ends of said frame with the mouths of the channels presenting toward each other, a horizontally disposed platform for supporting a load receiving body arranged immediately above said frame and provided with guide extensions at opposite ends thereof for reception within the mouths of said channels, a pair of pulleys journalled within the upper end of each standard, a single length cable doubled upon itself and arranged with the free ends thereof traversing the pulleys in each standard, the looped ends of each cable respectively engaging the aforesaid guide extensions of said platform, and elevating screw arranged within each standard, and a cable block axially movable upon each of said screws upon rotation of the latter, the said free ends of each cable being secured to each of said cable blocks, and means for commonly actuating said screws whereby to raise or lower said platform.

6. In a vehicle of the character described, in combination, a main vehicle frame, a platform for supporting a load receiving body, elevating means operatively associated with the opposite ends of said platform whereby the latter may be raised or lowered, each of said elevating means being characterized by the provision of a vertically disposed screw, a cable block axially movable with respect to said screw and a cable connecting said cable block to one end of said platform, and means provided at opposite ends of said screw and operative automatically to absorb the shock of each cable block as it reaches the limit of its movement in one direction or the other.

7. In a vehicle of the character described, in combination, a main vehicle frame, a platform for supporting a load receiving body, elevating means operatively associated with the opposite ends of said platform whereby the latter may be raised or lowered, each of said elevating means being characterized by the provision of a vertically disposed screw the opposite extremities of which are provided with smooth surfaces, a cable block axially movable with respect to said screw and a cable connecting said cable block to one end of said platform, and means provided at opposite ends of said screw and operative automatically to absorb the shock of each cable block when the latter engages the smooth surface of the screw at the limit of its movement in one direction or the other, said last-mentioned means being further operative to automatically effect the threaded reengagement of the cable block with the screw when the cable block has reached the limit of its movement in one direction and the rotation of the screw is reversed.

THEODORE C. HARVEY.