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2,034,306

DUMP TRUCK

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2 Sheets-Sheet 1

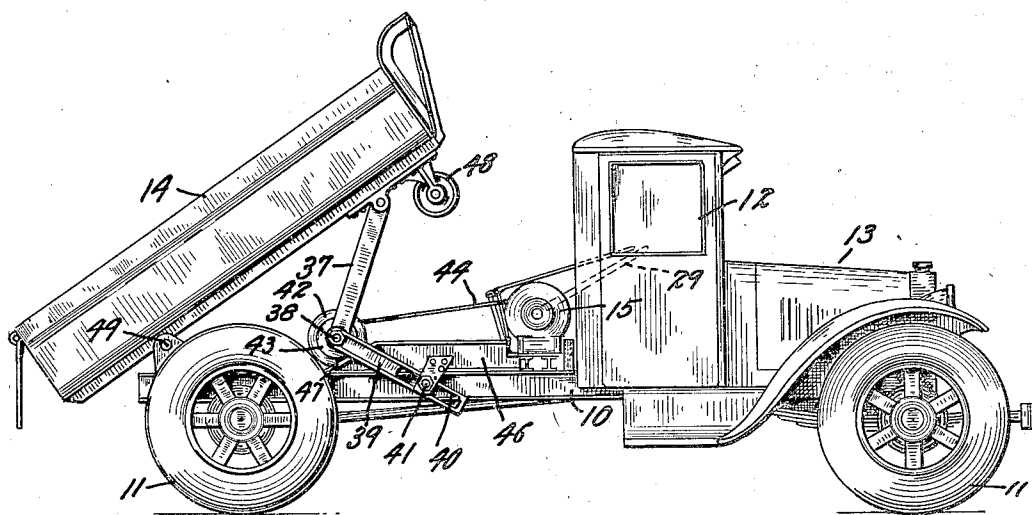


FIG. 1.

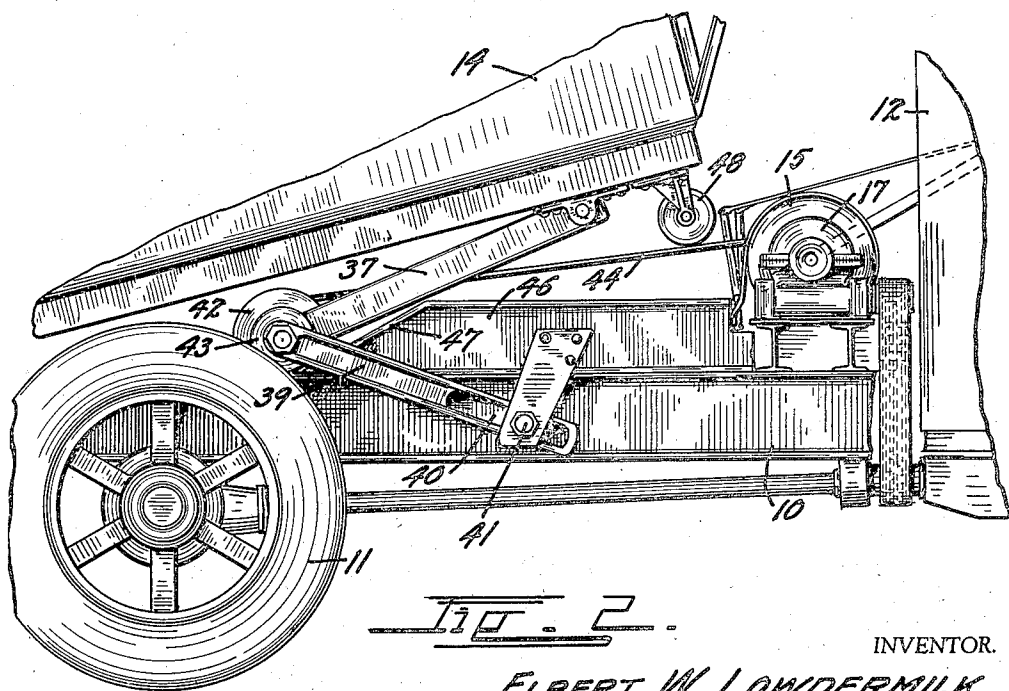


FIG. 2.

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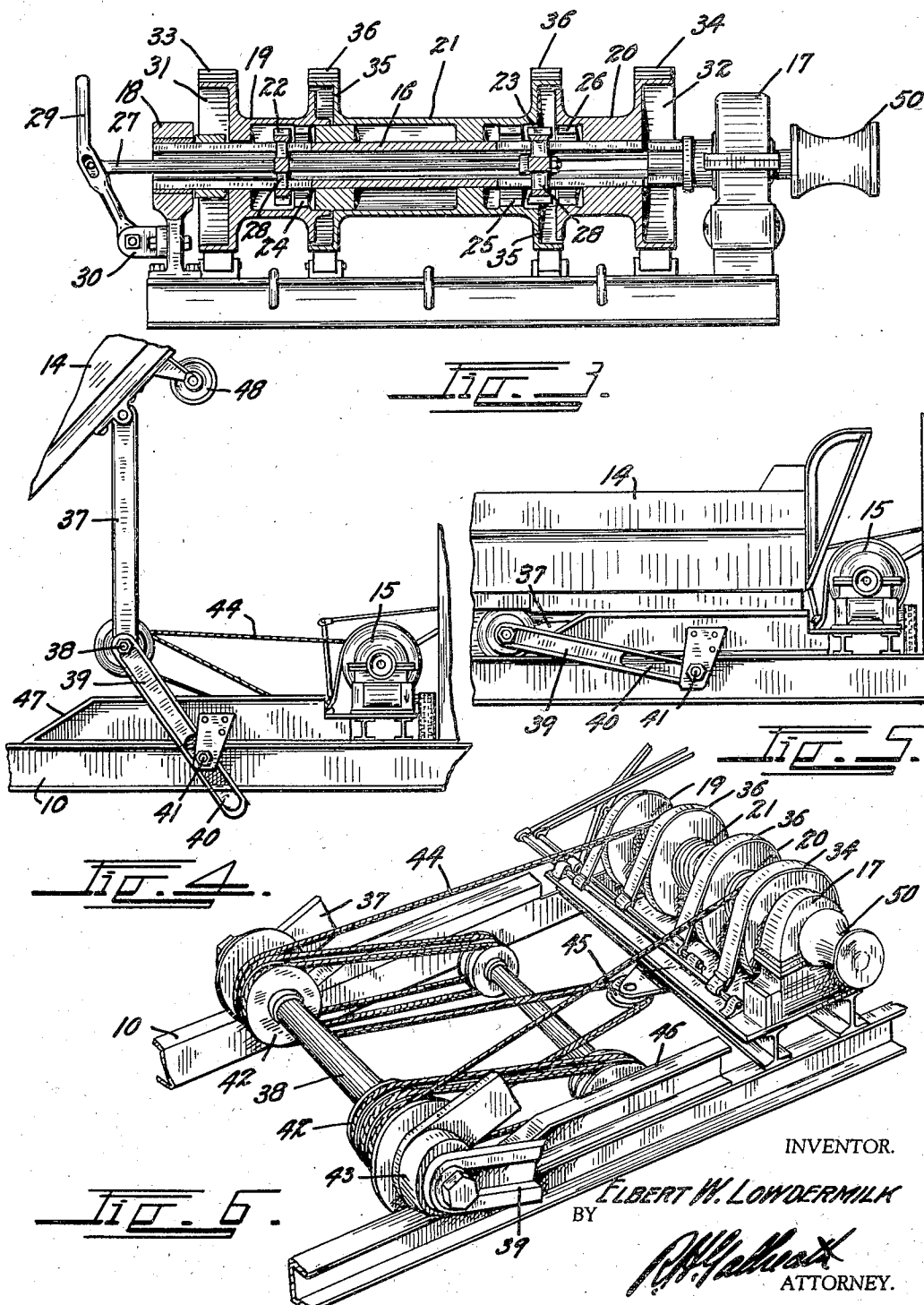
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DUMP TRUCK

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4 Claims. (Cl. 298—19)

This invention relates to a dump truck and has for its principal object the provision of a dump construction, which will elevate the dump body to an exceedingly high elevation; which can be operable from the usual truck winch; which will require a minimum of power to elevate a maximum load; which will eliminate all projecting posts, hoists, etc.; and which will rapidly raise and lower the body or lock the same in any desired position.

Another object of the invention is to so construct the device that a series of different leverages will be employed; so that a minimum of power will be required to start a heavy load, carry it through the first heavy lifting stages; and thence rapidly through the final lighter lifting stages.

A further object of the invention is to provide a winch operating dump body which will not interfere with the use of the winch for hoisting operating derrick or other purposes.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawings which form a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawings:—

Fig. 1 is a side elevation of the improved dump truck illustrating it in the partially elevated position.

Fig. 2 is an enlarged fragmentary side elevation illustrating the bed starting to elevate.

Fig. 3 is a longitudinal section through the preferred form of winch employed with the invention.

Fig. 4 is a fragmentary side elevation illustrating the bed in the full elevated position.

Fig. 5 is a similar view illustrating the bed in the "down" position.

Fig. 6 is a detail perspective view illustrating the cable connections to the winch.

In the drawings: a typical truck chassis is indicated at 10 supported upon the usual wheels 11 and provided with the usual driver's cab 12, engine hood 13 and bed 14.

The bed 14 is pivoted to the rear of the chassis 10 upon a suitable hinge bolt 49. At the rear of the cab 12 is a winch 15 which may be any of the usual truck winches, but is preferably of a special design, as shown in Fig. 3.

The winch illustrated in Fig. 3 comprises a tubular winch shaft 16 driven from suitable worm drive gears enclosed in a housing 17. The worm drive may be connected with the engine drive shaft through a chain as is usual in truck winches. The winch shaft is supported in a bearing 18 at one extremity and in the winch housing 17 at its other extremity and terminates in a fixed spool or "nigger head" 50.

Mounted upon the winch shaft are two side dumping spools 19 and 20, positioned at each side of a main spool 21. All of the spools are normally free to rotate upon the winch shaft 16. A first sliding gear 22 is mounted on the winch shaft within the spool 19, and a second sliding gear 23 is mounted on the winch shaft between the spools 20 and 21. The first gear 22 may be brought into mesh with an internal gear 24 on the interior of the spool 19. The second gear 23 may be selectively brought into mesh with an internal gear 25 on the main spool 21 or an internal gear 26 on the side spool 20.

The two gears 22 and 23 may be moved axially by means of a slide rod 27 which extends into the hollow shaft 16 and connects by means of suitable spider arms 28 with the gears. The spider arms 28 slide in longitudinal slots formed in the wall of the tubular winch shaft 16. The slide rod is operated from an operating lever 29 which is connected to the slide rod 27 and fulcrumed in a bracket 30 on the support of the bearing 18. It is preferred to extend the operating lever 29 to a point within the reach of the operator in the cab 12.

It can be readily seen that as the operating lever 29 is swung inwardly (to the right in Fig. 3) it will cause the sliding gears 22 and 23 to lock the side spools 19 and 20 to the winch shaft 16. When swung outwardly, it will cause the sliding gear 23 to lock the main spool 21 to the winch shaft. When in between these two positions, none of the spools will be locked to the shaft, but will be free to rotate thereon.

The side spools 19 and 20 are formed with suitable brake drums 31 and 32 against which brake bands 33 and 32 act. The main spool 21 is provided with suitable brake drums 35 against which brake bands 36 act.

The dumping operation is accomplished by means of the side spools 19 and 20. The dumping mechanism consists of a pair of similar toggle arms 37 hinged below and at each side of the forward extremity of the bed 14, and terminating in a horizontal roller shaft 38. A pair of sliding arms 39 extend forwardly and downwardly

from the roller shaft 38 at each side of the chassis 10. These sliding arms are formed with elongated slots 40 in their forward extremities, through which guide bolts 41 pass. The bolts

41 are permanently fixed to the chassis 10.

The roller shaft 38 extends across the chassis 10, connecting the opposite pairs of levers 37 and 40. This shaft carries a series of sheave wheels 42 between the arms 37 and a roller 43 at each extremity between each pair of arms 37 and 39. A jack shaft 51 extends laterally across the chassis ahead of the roller shaft 38 and carries a second series of sheave wheels 52. An equalizing pulley 45 is mounted below the winch 15. An endless cable 44 is trained from each side spool of the winch rearwardly about the sheaves 42, thence forwardly about the sheaves 52 and around the equalizing pulley 53.

The side members of the chassis are formed with top track members 46, the rearward extremities of which are inclined to form an inclined track 47. This track is so positioned that when the sliding arms 39 are at their rearmost positions, with respect to the slots 40, the rollers 43 will be at the bottom of the inclined tracks 47. Beneath the forward extremity of the bed 14 is a cable roller 48, which, when the bed is down, rests upon the cables 44.

Let us assume that the bed 14 is in the horizontal position of Fig. 5, and that it is desired to dump the contents thereof. The operator swings the operating lever 29 to the right so as to engage the winch with the side spools 19 and 20. He then starts to reel in the cable 44. The first tightening of the cable acts to lift the sheave wheel 48 directly upward and start the initial dumping movement of the bed, as shown in Fig. 2. The tightening cable then acts to draw the roller shaft 38 toward the winch. This causes the rollers 43 to travel upwardly on the inclined tracks 42 so as to continue the upward movement of the bed and straighten the toggle of the arms 37 and 39. As the rollers move forwardly, the sliding arms 39 will also move forwardly until the extremities of the guide slots 40 reach the guide bolts 41. At this point, the rollers 43 will have reached the top of the inclined tracks 47. From then on, the action is a simple toggle action between the levers 37 and 39. The tightening cable will tend to straighten these levers and force the bed upwardly to the position of Fig. 5.

The bed may then be locked in the elevated position by means of the brake bands 33 and 34, the side spools can be released from the winch shaft, the winch clutch released and the truck started. The bed can then be lowered as desired by releasing the brake bands 33 and 34.

The brake bands can be operated in any suitable way, such as from brake lever shafts 51 and 52 operated from suitable brake levers convenient to the driver.

The dumping mechanism can be operated from the ordinary truck winch by simply training the cable 44 over the ordinary winch spool. This necessitates disconnecting the cable from the dumping mechanism when it is desired to use the winch for other purposes. With the winch of Fig. 3, however, the center spool 21 can be used for the usual winch purposes without interfering with the use of the side spools for dumping operations.

If desired, space could be conserved by placing the winch spools below the driver's seat in the cab 12. Thus, enabling the entire chassis to be used for bed purposes.

It is desired to call particular attention to the fact that it is always difficult to start the movement of a pair of closed toggle arms. Therefore it would require excessive power to cause the cable to pull directly upon the roller shaft 38 to obtain the initial lift. In this invention, this excessive power requirement is avoided, first, by allowing the tightening cable to lift directly on the front of the bed, through the roller 48; second, by allowing the toggle arms to slide forward while the rollers travel up the inclined tracks 47. After this first movement is started, it is comparatively easy for the cable to straighten the toggle arms for the final lift. By bringing the cable about the two series of sheaves 42 and 52, a leverage is also obtained to assist the raising of the bed.

The equalizing pulley 45 acts to equalize the strain in the cable 44 and to cause the cable to lift equally at both sides of the chassis. It would be practically impossible to obtain an equal lift at both sides with two independent cables since it would be impossible to start reeling both of them simultaneously and to retain them at equal lengths.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:—

1. Means for dumping a hinged truck body comprising: a chassis; a body hinged at its rear extremity to said chassis; a first pair of toggle arms hinged to said chassis; beneath the forward extremity of said body; a second pair of toggle arms hinged to said first pair and extending upwardly therefrom to a connection with said body; a winch supported on said chassis; a cable connecting said winch with the hinge point between said arms so as to pull the latter to a straight position to elevate said body; rollers positioned at the hinge points of said toggle arms and inclined planes carried by said chassis beneath said rollers to impart the initial movement to said body as said cable tightens, said toggle arms being arranged to allow a limited preliminary movement for the actuation of said rollers.

2. In a truck body having a chassis and a dumping body hinged adjacent the rear extremity of said chassis, means for lifting the forward extremity of said body comprising: a first pair of toggle arms hinged to each side of the forward extremity of said body and extending normally rearward thereunder; a roller shaft extending between the rearward extremities of said arms; a cable wheel mounted on said roller shaft between said arms; a second pair of toggle arms mounted at their rearward extremities on said roller shaft and extending normally forward therefrom; guide members secured to each side of said chassis, said second pair of arms being slotted to pass over said guide members; a winch mounted on said chassis; a cable extending rearwardly from said winch about said cable wheel and forwardly to a connection with said chassis, said body normally resting upon said cable when in the lowered position.

3. In a truck body having a chassis and a dumping body hinged adjacent the rear extremity of said chassis; means for lifting the forward extremity of said body comprising: a first pair of toggle arms hinged to each side of the forward

extremity of said body and extending normally rearward thereunder; a roller shaft extending between the rearward extremities of said arms; a cable wheel mounted on said roller shaft between said arms; a second pair of toggle arms mounted at their rearward extremities on said roller shaft and extending normally forward therefrom; guide members secured to each side of said chassis, said second pair of arms being slotted to pass over said guide members; rollers mounted on each extremity of said roller shaft; inclined surfaces on said chassis below said rollers, said surfaces being positioned so that as said rollers travel therealong, said slots will move along said guide members; a winch mounted on said chassis; and a cable extending from said winch to said cable wheel so as to draw said roller shaft forwardly.

4. A dump truck construction comprising: a chassis; a dump body hinged adjacent the rear extremity of said chassis; a pair of toggle arms hinged to and suspended from the forward extremity of said body at each side thereof; a guide stud carried at each side of said body, the lower arm of each pair of toggle arms being slotted to receive said stud; a shaft connecting the hinge points of said pairs of toggle arms; rollers carried by said shaft; inclined members positioned immediately ahead of said rollers; and cable means for drawing the hinge point of said toggle forwardly so that said rollers will travel upward on said inclined members as the lower arms travel forward on said studs.

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