

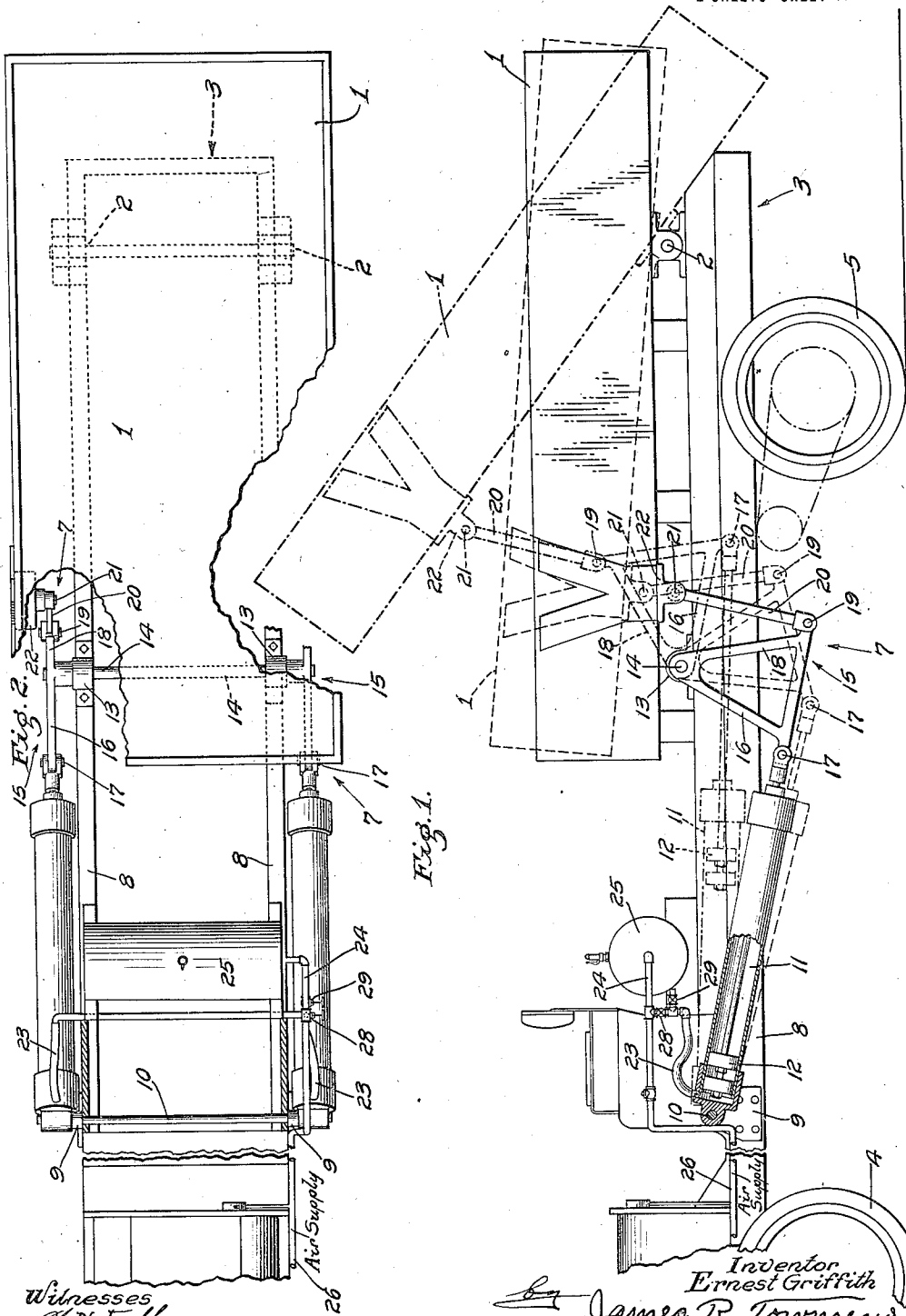
E. GRIFFITH.
TRUCK HOIST.

APPLICATION FILED MAY 14, 1913.

Patented June 27, 1916.

2 SHEETS—SHEET 1.

1,188,932.



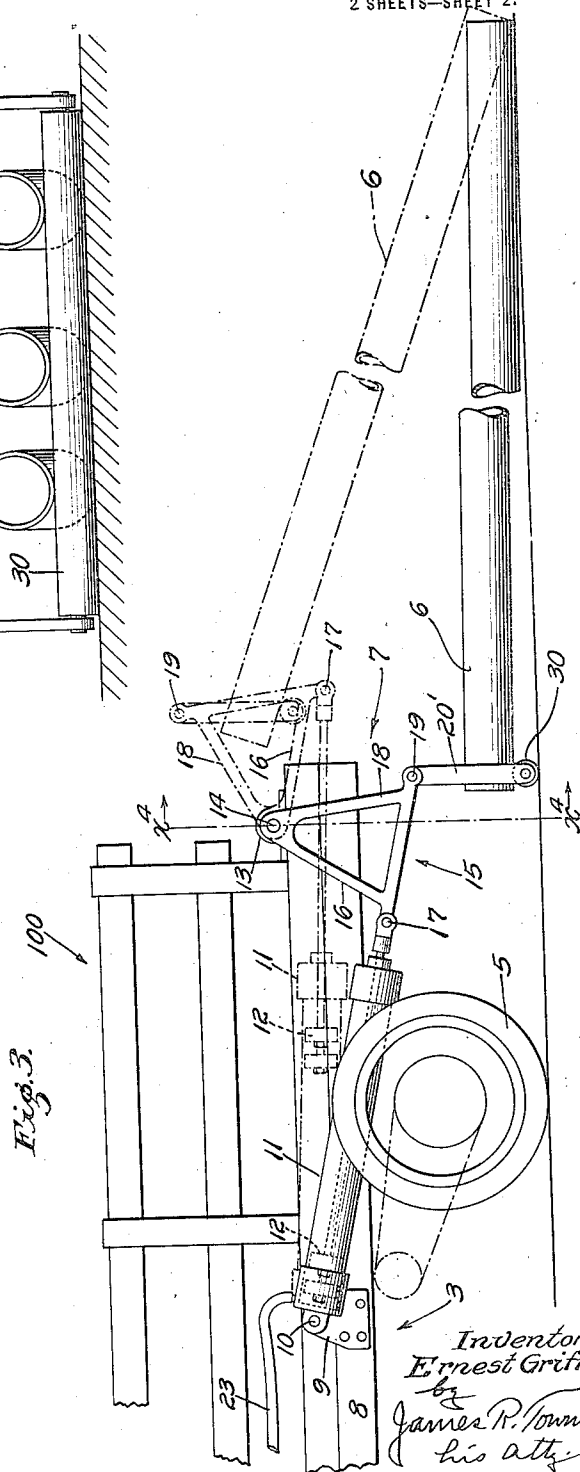
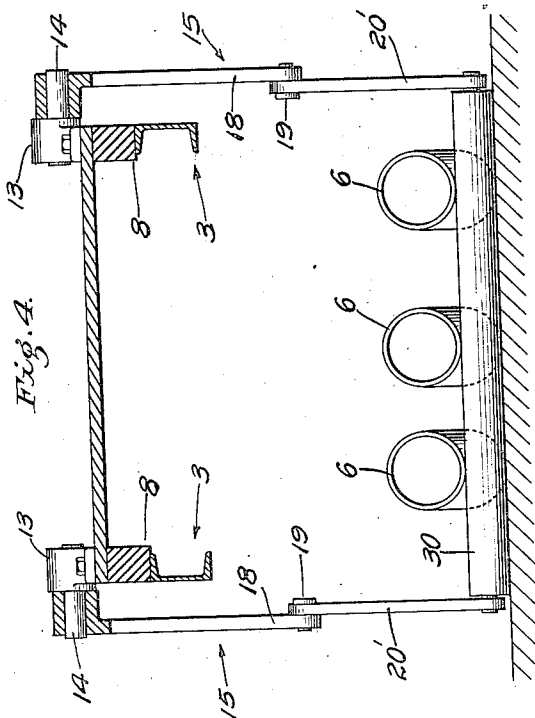
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Patented June 27, 1916.

2 SHEETS—SHEET 2.

1,188,932.



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UNITED STATES PATENT OFFICE.

ERNEST GRIFFITH, OF BAKERSFIELD, CALIFORNIA.

TRUCK-HOIST.

1,188,932.

Specification of Letters Patent. Patented June 27, 1916.

Application filed May 14, 1913. Serial No. 767,899.

To all whom it may concern:

Be it known that I, ERNEST GRIFFITH, a subject of the King of Great Britain, residing at Bakersfield, in the county of Kern and State of California, have invented a new and useful Truck-Hoist, of which the following is a specification.

This invention relates to that class of vehicles in which mechanism is employed to tilt the vehicle body to dump its load.

An object of the invention is to effect the foregoing by means which will allow the vehicle body to rest in its normal loaded position and in its load-receiving position at minimum height above the vehicle wheels, so that loading of the same will be facilitated.

It has been necessary in trucks of the kind heretofore in use to mount the body at considerable distance above the vehicle in order to accommodate the body-tilting mechanism and an object of this invention is to so construct and arrange the tilting mechanism that the vehicle body may be mounted at the height usual in other classes of vehicles with the body-tilting mechanism below the body and top of the chassis.

Another object is to effect tilting of the body with minimum expenditure of power. Generally stated, the invention involves the use of a bell-crank lever arranged in such manner that during the preliminary body-tilting movement the loaded end of the lever will effect a comparatively slight vertical lift for a comparatively great horizontal movement of the power end of said lever.

More specifically, the invention comprises a bell-crank lever pivotally mounted on the chassis and pivotally connected to a horizontally operated fluid-actuated piston working in a cylinder which is also pivoted to the chassis.

Another object is the production of a device of this character in which the greater part of the vehicle body and its load, for instance eight-elevenths more or less, will normally be effective to prevent tilting of the vehicle body thus avoiding the use of and reliance upon latches to prevent such tilting.

Another object is to facilitate the loading of pipe and the like.

Other objects are simplicity and strength of construction and simplicity and efficiency of operation.

The invention may be embodied in different ways and further objects and advantages may appear from the subjoined detailed description in which two embodiments of the invention are described.

The accompanying drawings illustrate the invention.

Figure 1 is a fragmentary side elevation of one embodiment of the invention, a cylinder being shown partly in section. The loading position of the parts is shown in solid lines, and the dumping and intermediate positions are indicated in broken lines. Fig. 2 is a plan of Fig. 1. Portions of the body and seat are broken away and the wheels are omitted. Fig. 3 is a fragmentary side elevation of another embodiment of the invention, more particularly designed to carry pipe and the like. Solid lines indicate positions of parts for receiving the pipe which is also shown, and broken lines indicate the parts in positions they would occupy with the forward end of the pipe raised above the level of the chassis. Fig. 4 is a sectional elevation on line indicated by $\alpha\alpha$, Fig. 3 looking in the direction of the arrows.

The vehicle body 1 may be of any desired shape and construction and is shown in Figs. 1 and 2 of the drawings as a rectangular box pivotally mounted considerably to the rear of its center and near its rear end at 2 to a chassis 3 of the usual or any preferred construction or the chassis may be provided with a frame or guard as in Fig. 3 and the chassis is provided with front and rear wheels 4, 5.

The pivots 2 are located quite near the rear end of the chassis and the body 1 is shown, for example, substantially eleven feet long and said pivots are located substantially three feet from the rear end of the body so that when the body is loaded with crushed rock or the like, not shown, more than two-thirds, and in this particular instance eight-elevenths of the load, will be forward of the pivots so that tendency for the body to tilt to discharge its load will be practically nil. It is clear that if the body be provided with a load of lumber or the like, not shown, the pieces may be of considerable length and project considerably to the rear of the chassis without overbalancing and tilting the body.

As shown in the drawings, I prefer to employ a pair of tilting mechanisms 7, one on

each side of the vehicle, and a detailed description of one of said mechanisms will describe both as they are alike in every respect, and for this purpose each side member 8 of the chassis is provided with a bracket 9 carrying a suitable shaft 10 or the like to pivot a fluid pressure cylinder 11 having a reciprocating piston 12. The cylinder and piston 11, 12 are substantially horizontal and are parallel along the sides of and in practically the same horizontal plane as the chassis 3 so as not to project above the level of the chassis.

Means are provided to translate the horizontal movement of the piston 12 to a vertical load-lifting movement and this is effected by a construction which, when the piston 12 is at the beginning of its stroke, will produce a comparatively slight lifting movement relative to the length of the piston stroke, the ratio being at the start, say for example 1 to 4, and gradually increasing until said movement is equal in magnitude to the piston stroke near the end of said stroke, and gradually increasing until at the end of the piston stroke the ratio will be 4 to 1, thus starting the load slowly with great power. For this purpose the chassis 3 is provided on the upper face of each side member 8 with a journal box 13 which receives a pivot shaft 14 of a bell-crank lever 15 that has its power arm 16 pivotally connected at 17 to the piston 12 and that in the form shown in Figs. 1 and 2 has its load arm 18 pivotally connected by a pivot 19, a connecting rod or carrier-arm 20, a pivot 21, and a bracket 22 to the forward end of the bottom of the vehicle body 1.

The movements of the tilting mechanisms 7 may readily be traced in Fig. 1 from the normal untilted body position, with the load arm 18 nearer the vertical, through the intermediate dotted body-tilting position to the dot and dash body-tilted position, with the load arm 18 nearer the horizontal, and the hereinbefore mentioned ratios of movement will be readily observed.

The cylinders 11 are each connected behind the piston 12 through flexible branch air tubes 23 and a main air tube 24 to a compressed air tank 25 which may be supplied with compressed air through a supply pipe 26 by any suitable means and in this instance may be so supplied by an air compressor, not shown, driven by the vehicle engine, not shown, all of which will be clearly understood without illustration. The main air tube 24 is provided with an inlet valve 28 and an exhaust valve 29.

In practical use the vehicle in Fig. 1 being in the solid line position may be driven under a chute or loading spout, not shown, to be loaded with material or may receive its load in any other manner; and it is observed that the arrangement of the various parts is

such that the body when loading sets at substantially the same height from the ground as it would if no tilting mechanism were employed so that it will not strike any overhead structure that is built with the ordinary head room; and it is further observed that this construction places the center of gravity sufficiently low to minimize tendency to upsetting of the vehicle.

When it is desired to discharge the load the exhaust valve 29 will be closed and the inlet valve 28 will be opened to admit compressed air from the tank 25 behind the piston 12 to move the piston on its outward stroke so as to operate the bell-crank lever 15 to up tilt the vehicle body, as in dotted lines, whereupon the material will slide from the vehicle. Then the body may be returned to its horizontal loading position by closing the inlet valve 28 and opening the exhaust valve 29, through which the operating charge of air will be expelled by the weight of the body.

In the form shown in Fig. 3 the levers 15 are connected by the pivot 19 to a U-shaped stirrup comprising a pair of carrier-arms 20' and a roller 30 upon which the forward ends of the pipes 6, or the like, may be placed when the lever 15 is in its lowered position and which lever may be operated as hereinbefore described by horizontal movement of the piston 12 to raise said ends of the pipe, whereupon the pipe may be shoved over the roller 30 and into place upon the chassis 3.

It is to be noted that by the construction hereinbefore set forth the entire tilting mechanisms in all of their positions are below the tops of the vehicle body so that the loading chute or spout cannot strike them as frequently occurs with tilting devices heretofore employed which generally project considerably above the vehicle body; and it is observed that the cylinders and pistons are always below the level of the chassis so that liability of damage occurring to them is minimized and so that, in event of it being desired to remove the body or guards, as the case may be, and employ the truck for general purposes, loading and unloading along the sides of the chassis may be accomplished without endangering the tilting mechanisms.

I claim:—

1. A truck hoist comprising a chassis, a bell-crank lever pivoted to the chassis and having its load arm adapted to swing from nearer the vertical to nearer the horizontal, a cylinder pivoted to and extending horizontally along the chassis, and a piston working in the cylinder and pivotally connected to the bell-crank lever, said piston being adapted to swing the load arm as stated during the power stroke of the piston.

2. A truck hoist comprising a chassis, bell-crank levers pivoted at the sides of the

chassis, a stirrup connecting an arm of one lever to an arm of the other lever, and a horizontally acting piston pivoted to the other arm of one of said levers.

5 3. A truck hoist comprising a chassis, levers pivoted at the sides of the chassis, carrier arms pivoted to said levers, a roller connecting said carrier arms, and means to operate said lever.

0 4. A truck hoist comprising a chassis, a cylinder extending along one side of the chassis, a piston working in said cylinder, a bell-crank lever pivoted at said side of the chassis, one arm of said bell-crank lever being pivoted to the piston and both arms of said bell-crank lever extending downward from the pivot when the piston is retracted in the cylinder, a carrier arm pivoted to the second arm of the bell-crank lever and ex-

tending substantially vertical, and means to 20 supply compressed air to said cylinder.

5. A truck hoist comprising a chassis, a cylinder pivoted to the side of the chassis and extending therealong, a piston working in said cylinder, a bell-crank lever pivoted 25 at the side of the chassis and having its power arm pivoted to the piston and extending substantially normal to the piston when said piston is retracted, and a carrier arm pivoted to the load arm of said bell- 30 crank lever.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 9th day of May, 1913.

ERNEST GRIFFITH.

In presence of—

JAMES R. TOWNSEND,
L. BELLE WEAVER.