Oct. 31, 1933. F. G. CLARK 1,932,690

HOIST FOR TILTING DUMP BODIES

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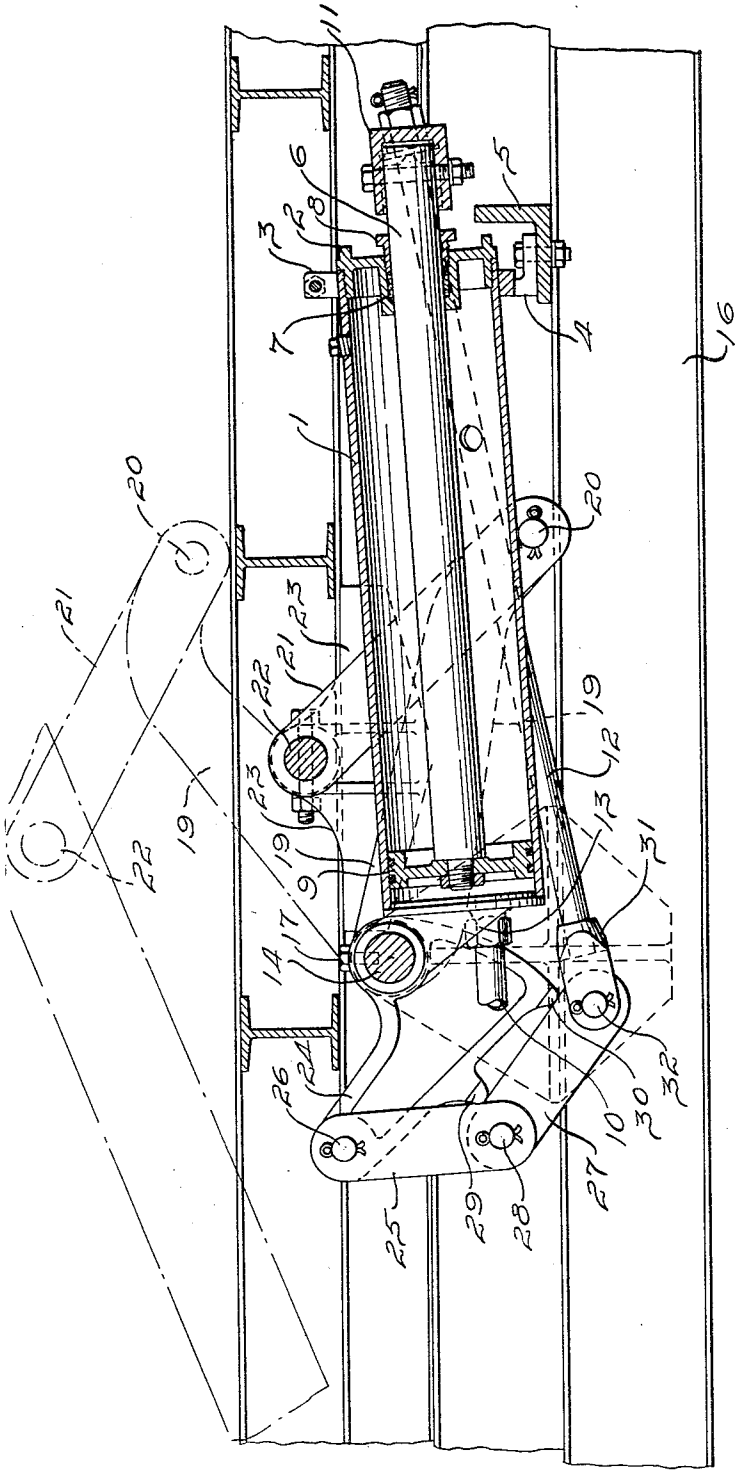


Fig. 1.

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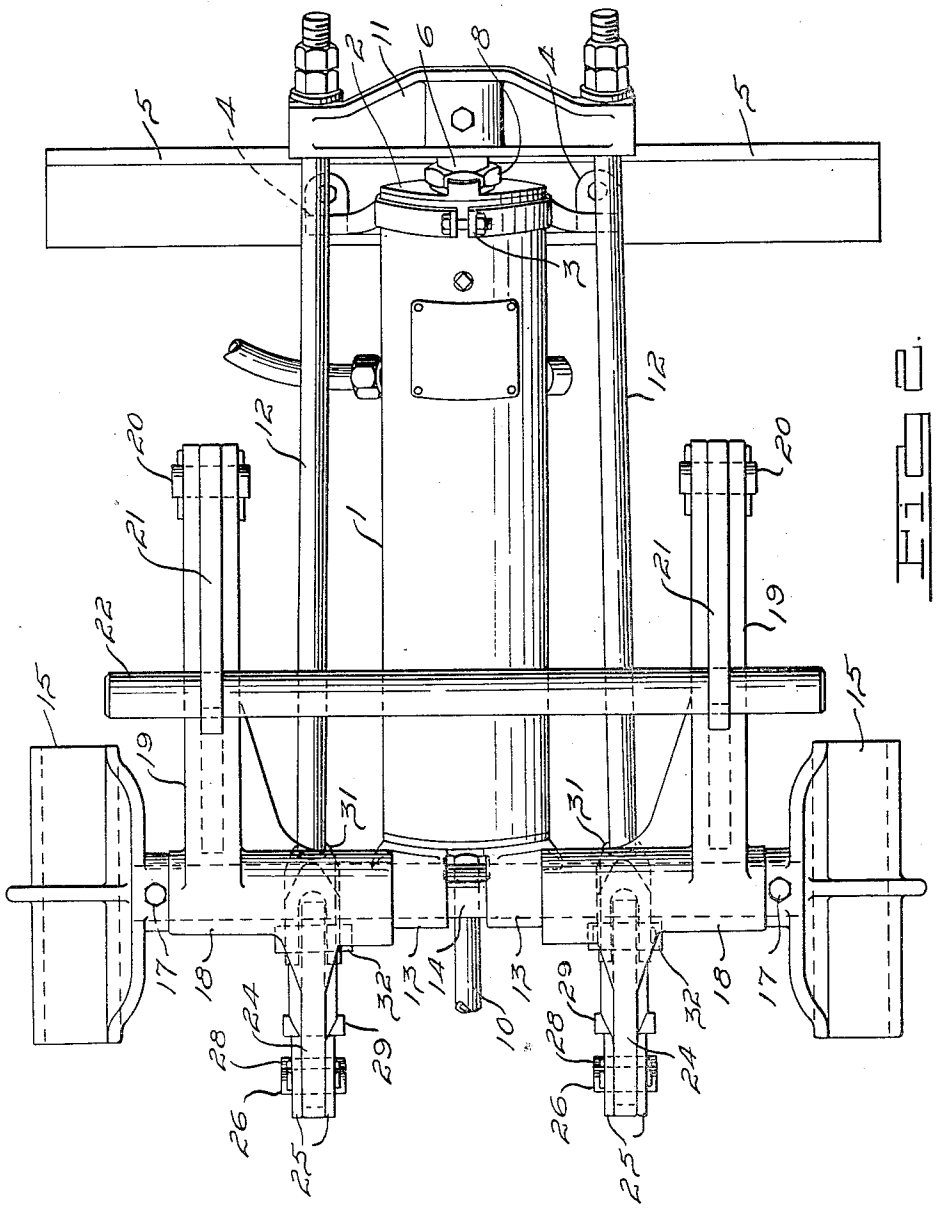


Fig. 2

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HOIST FOR TILTING DUMP BODIES

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4 Claims. (Cl. 298—22)

This invention relates to hoists for tilting dump bodies and the object of the invention is to provide a hydraulic hoist which will easily raise a tilting dump body and which is designed to have different lifting leverages at different points of the body travel.

Another object of the invention is to provide an arrangement consisting of a series of links engaging against companion points on a lifting crank so that varying advantage is attained in relation to the load as the body is raised and as the load is dumped.

A further object of the invention is to provide a shaft having arms for tilting the body and provided with crank members having extending lugs, a series of links being provided connected to the crank members and movable by a yoke from a substantially horizontal hydraulic hoist, the said links engaging the lugs of the crank members and providing variable leverages as the crank members are turned by movement of the links.

Another object of the invention is to provide a hoist for tilting dump bodies arranged to absorb twisting or side-wise movement of the truck body during hoisting thereof.

A further object of the invention is to provide a hydraulic hoist having a yoke across the end to which the pull rods are connected, the said pull rods being provided with a series of links riding on the crank members and arranged to vary the leverage applied to the dumping body as the links are drawn forward by the pull rods to turn the crank members.

These objects and the several novel features of the invention are hereinafter more fully described and claimed and the preferred form of construction by which these objects are attained is shown in the accompanying drawings in which—

Fig. 1 is a longitudinal section through a hoist for tilting dump bodies embodying my invention.

Fig. 2 is a plan view thereof.

As shown in Figs. 1 and 2 the hydraulic hoist comprises a cylinder 1 having a cap 2 threaded into the forward end thereof and the cylinder is supported in a bracket 3 provided with feet 4 which are mounted on the cross frame member 5. A shaft 6 extends through the cap 2 and a packing 7 is provided for the shaft which is held in place by the packing nut 8. At the end of the shaft 6 within the cylinder 1 a piston 9 is provided and an inlet 10 is also provided through which the hydraulic fluid under pressure may be pumped into the cylinder to move the piston and shaft 6. Secured to the outer end of the shaft 6 is a yoke 11 through which the ends of the pull rods 12 extend as shown in Fig. 2. At the rear end the cylinder is provided with a pair of brackets 13 supported on the cross shaft 14 and this shaft at each end is secured in brackets 15 which in turn are secured to the side frame members 16 of the dump truck. The shaft 14 is secured in the brackets 15 by the screws 17 and rotatably mounted on the shaft 14 between the brackets 15 and the brackets 13 of the hydraulic hoist cylinder is a pair of castings 18. Each casting 18 is provided with an extending arm 19 which is of the form shown in Fig. 1 and is provided with a bifurcated end carrying a clevis pin 20.

Rotatably mounted on the clevis pin 20 is a straight arm 21 which is rotatably mounted on the cross shaft 22. This cross shaft 22 is supported in brackets 23 shown in Fig. 1, which are secured to the frame of the dump body and the shaft 22 is thus carried by the body. Each casting 18 is also provided with a crank 24 extending from the side of each casting 18 opposite the arm 19. 9 link 25 is pivotally mounted on a pin 26 mounted in the end of the crank 24 and a second link 27 is pivotally mounted on the pin 28 carried by the opposite end of the link 25. The crank 24 is provided with a pair of lugs 29 and 30 which are contacted by the links 25 and 27 and each pull rod is provided with a yoke 31 carrying a pin 32 to which the end of the link 27 is pivotally connected.

In Fig. 1 the device is shown in full lines with the body in the lowered position and in dotted lines in the partially raised position. In operation the fluid under pressure passes through the pipe 10 into the cylinder 1 forcing the piston 9 and shaft 6 toward the right of Fig. 1. This carries the yoke 11 and the pull rods 12 toward the right of the said figure and exerts a pull on the links 25 and 27 to turn the cam members 24. The initial leverage applied to the cam 24 is the distance between the center of the clevis pin 32 and the center of the shaft 14. As the cam members 24 are turned the secondary leverage comes into action as the links 27 move off from the points 30 of the cam members 24. This secondary leverage is equal to the distance between the center of the clevis pin 28 and the center of the shaft 14 and this distance is slightly longer than the initial leverage distance so that the upward movement of the body is continuous during the unfolding action of the arms 19 and 21, indicated in dotted lines in Fig. 1.

As the cam members 24 are further turned the links 25 and 27 come off from the lugs 29 of the cams 24 so that the pull is then applied to the clevis pin 26. The distance between the center of the clevis pin 26 and the center of the shaft 14 is the shortest leverage distance of the three leverages and tends to increase the upward movement of the body as it approaches the final dumping position. By this arrangement, a series of different leverages are applied to the body through a single pressure medium and the effect of the varying leverages is to compensate for the load on the mechanism and to maintain a uniform upward movement of the body during dumping and equalizing the unfolding movement of the lifting arms 19 and 21.

From the foregoing description it becomes evident that the device is very simple and efficient in operation, will not easily get out of order, provides a variable advantage over the load by the use of different leverages and provides a device which accomplishes the objects described.

Having thus fully described my invention, its utility and mode of operation, what I claim and desire to secure by Letters Patent of the United States is—

1. In a hoist for dump truck bodies, a chassis frame, a dump body pivotally mounted thereon to tilt, a hydraulic ram supported in the chassis frame and having a movable yoke, a transverse shaft mounted in the chassis frame, a pair of tubular members rotatably mounted on the transverse shaft, a rocker arm formed integrally with each tubular member, a lifting arm connecting each rocker arm with the dump body and arranged upon turning of the rocker arms to tilt the dump body, a cam member formed integrally with each tubular member, each cam member being provided with an extending end opposite the rocker arm and being provided with a comparatively straight edge, a link pivotally connected to the extending end of each cam, a second link pivotally connected to the free end of the first link, a pull rod connecting the free end of each second link with the yoke of the hydraulic ram, each cam member being provided with a lug extending from its straight edge and adapted to be engaged by both links adjacent their common pivot point, each cam member being also provided with a second lug extending from its straight edge and normally engaged by the second link adjacent its pivotal connection with the pull rod, the lugs being so arranged that upon movement of the pull rods the cam members are turned by the links to apply varying leverages in raising the dump body.

2. In a hoist for dump truck bodies, a chassis frame, a dump body pivotally mounted thereon to tilt, a hydraulic ram supported in the chassis frame and having a movable yoke, a transverse shaft mounted in the chassis frame, a pair of tubular members rotatably mounted on the transverse shaft, a rocker arm formed integrally with each tubular member, a lifting arm connecting each rocker arm with the dump body and arranged upon turning of the rocker arms to tilt the dump body, a cam member formed integrally with each tubular member, each cam member being provided with an extending end opposite the rocker arm and being provided with a comparatively straight edge, a link pivotally connected to the extending end of each cam, a second link pivotally connected to the free end of each first link, a pull rod connecting the free end of each second link with the yoke of the hydraulic ram, each cam member being provided with a lug extending from its straight edge and adapted to be engaged by both links adjacent their pivot point, each cam member being also provided with a second lug extending from its straight edge and normally engaged by the second link adjacent its pivotal connection with the pull rod.

3. In a hoist for dump truck bodies, a chassis frame, a dump body pivotally mounted thereon to tilt, a hydraulic ram supported in the chassis frame and having a movable yoke, a transverse support, a pair of rocker members rotatably mounted on said transverse support, an arm secured to each rocker member and to the dump body and arranged upon turning of the rocker member to tilt the dump body, a cam member formed integrally with each rocker member, each cam member being provided with an extending end and a straight face, a link pivotally connected to the extending end of each cam, a second link pivotally connected to the free end of the first link, a pull rod connecting the free end of each second link with the yoke of the hydraulic ram, each cam member being provided with a lug engaging both links adjacent their pivot points and each cam member being also provided with a second lug normally engaged by the second link adjacent its pivotal connection with the pull rod, the lugs being supported on the straight face of each cam member at varying distances from the center of rotation thereof.

4. In a hoist for dump truck bodies, a chassis frame, a dump body pivotally mounted thereon to tilt, a hydraulic ram supported in the chassis frame and having a movable yoke, a transverse support, a pair of rocker members rotatably mounted on said transverse support, an arm secured to each rocker member and to the dump body and arranged upon turning of the rocker member to tilt the dump body, a cam member formed integrally with each rocker member, each cam member being provided with an extending end and a comparatively straight edge, a series of links pivotally connected to the extending end of each cam, a pair of lugs extending from the straight edge of the cam and supporting the links at varying distances from the center of rotation of the cam and a pull rod connecting each series of links with the yoke of the hydraulic ram.

FRANK G. CLARK.