May 12, 1942. L. W. WACHTER 2,282,507

HOIST CONTROL MEANS

Filed Jan. 22, 1941 2 Sheets-Sheet 1

Fig. 1.

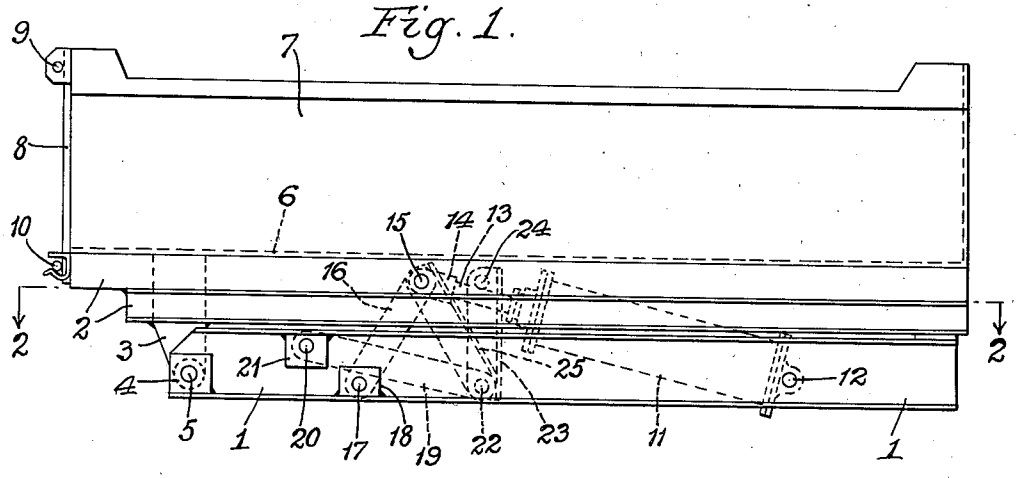
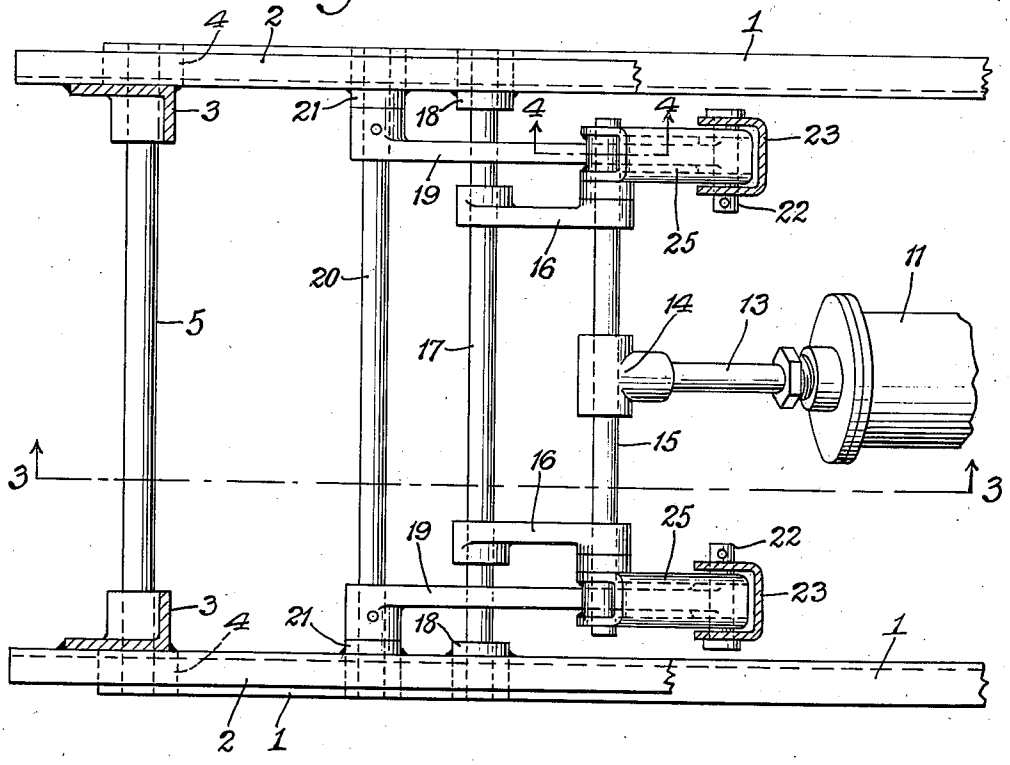


Fig. 2.



Inventor.
Lester W. Wachter.
by Roper & Carter.
Attorneys.

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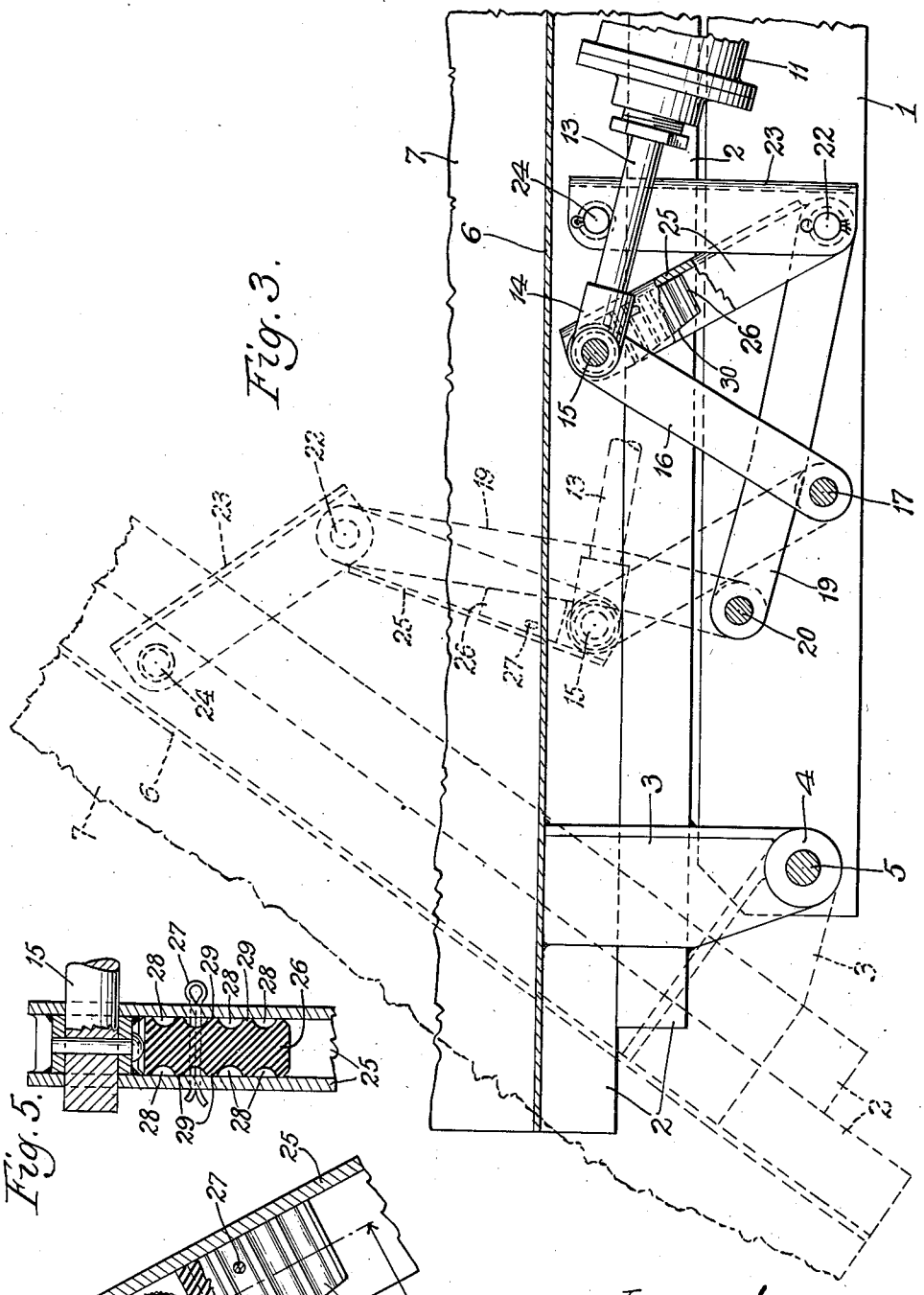


Fig. 3.

Fig. 5.

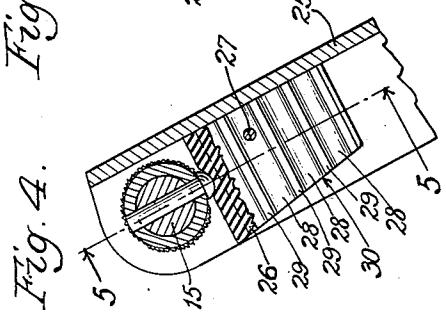


Fig. 4.

Inventor.
Lester W. Wachter.
by Rader & Carter.
Attorneys.

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UNITED STATES PATENT OFFICE

2,282,507

HOIST CONTROL MEANS

Lester W. Wachter, Streator, Ill., assignor to Anthony Company, Streator, Ill., a corporation of Illinois

Application January 22, 1941, Serial No. 375,474

17 Claims. (Cl. 298—22)

This invention relates to means for tipping a support or receptacle, and has for one object to provide means for controlling the tip and for preventing over-tipping. Another object is to provide means in connection with a tipping mechanism for cushioning the movement of the mechanism in the tipping direction and for assisting in the return from the tipping direction.

Other objects will appear from time to time throughout the specification and the claims.

This invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a side elevation of the invention as applied to a tipping receptacle;

Figure 2 is a horizontal section taken at line 2—2 of Figure 1 on an enlarged scale;

Figure 3 is a longitudinal vertical section taken at line 3—3 of Figure 2 on a further enlarged scale;

Figure 4 is a sectional detail taken at line 4—4 of Figure 2 on an enlarged scale;

Figure 5 is a sectional detail taken at line 5—5 of Figure 4.

Like parts are indicated by like characters throughout the specification and the drawings.

In the particular form here shown, the tipping mechanism and the receptacle to be tipped are carried on a frame or base which includes members 1, 1. The further details of the frame are not shown as they form no essential part of the invention. Any suitable part might be used.

Mounted on the base 1 is a subframe 2 which includes longitudinal members and suitable transverse members, if necessary. The longitudinal members may be formed of single channels or multiple parts in any shape desired. At one end, hinge members 3 are secured to the frame members 2, and they are pivoted as at 4 on the base 1. The pivot may include a shaft 5 or other suitable means. Mounted on the subframe 2 is a receptacle having a bottom 6 and side walls 7. At the rear, a tail gate 8 may be pivoted as at 9 or as at 10, or any form of gate construction may be used.

The tipping or dumping mechanism comprises means for dumping the platform or frame 2 with respect to the support 1. Obviously, dumping means may be used whether there is a receptacle or a mere platform or other support for material to be carried and subsequently dumped.

The dumping mechanism here shown includes a hydraulic cylinder 11 pivoted to the support 1 as at 12. A piston, not shown, is mounted within the cylinder, and a piston rod 13 extends outwardly from the cylinder. The piston and piston rod are moved by pressure fluid which is supplied from any suitable source and is supplied and controlled by means not here shown since their details form no part of the present invention. The piston rod 13 is fastened to a cross head 14 which is mounted upon a shaft 15. Pivoted at their upper ends on the shaft 15 are links 16, 16, which at their lower ends are pivoted on a rod 17 which is mounted in members 18 on the frame or base 1. A second pair of links 19, 19 is mounted on a rod 20 which is supported in members 21, 21 on the base 1. The links 19 are pivoted at their free ends by means of pins 22 to links 23. These links are preferably of channel section, as shown in Figure 2 in particular. At their upper ends they are pivoted as at 24 to the frame 2 or the body 6. Pivoted also on the pins 22, and preferably within and embraced by the links 23, are additional links 25, 25. These links are preferably of channel section, and at their upper ends are pivoted to the cross shaft 15 upon which the cross head 14 is mounted.

Mounted within the links 25 are rubber or other relatively resilient and relatively yielding blocklike members 26. These members are shown in detail in Figures 4 and 5, and may be held in place by cotter pins 27, or otherwise. As shown, the members 26 are preferably provided with alternating grooves 28 and lands 29. The lands may be in contact with the interior surface of the links 25. The blocks 26 are preferably so positioned in their respective links 25 that along one face they are in contact with the bottom of the channels of which these members are made. Along their outer face, they are inclined somewhat as at 30. The direction of the inclination of the faces 30 is preferably away from the end of the link 25 which is pivoted upon or secured to the shaft 15.

Although there is shown an operative form of the device, it will be understood that many changes in the form, shape and arrangement of parts might be made without departing from the spirit of this invention, and it is wished that the showing be taken as, in a sense, diagrammatic.

In particular, where reference has been made to rubber as a cushioning or restraining means or tip-preventing means, it is to be understood that this expression means rubber or a material which has substantially its equivalent physical properties.

The use and operation of this invention are as follows:

In the form illustrated herewith, the invention is embodied in tipping means for the body of an automobile truck. Some means for supplying fluid under pressure—such, for example, as a hydraulic pump—is provided, and it may be conveniently operated by the engine of the vehicle or otherwise. Figure 1 is the upright or untipped position. When it is desired to tip the body, fluid under pressure is applied to the cylinder and the piston is forced from the full line

position of Figure 3 toward the dotted line position of that figure. When that occurs, links 16 and 19 are rotated from their full line positions to their dotted line positions. In the particular form here shown, when the body floor has tipped to about 42 degrees, the link 19 contacts the cushion 26, which is positioned within the link 25. Further tip is thus yieldingly resisted until the body reaches its full tip which, with the proportions here shown, is approximately 55 degrees. Obviously, these relationships of inclination can be varied, and those mentioned specifically are merely an example of one suitable installation.

Bodies of this general type have a tendency to "overrun" as they approach a steep angle of tip. Obviously, the center of gravity is moved to the rear in tipping, and the combined weight of the body and load sometimes "runs away" from the tipping mechanism, and the body has a tendency to tip violently or snap to the rear. This is unsatisfactory for many reasons and particularly because it tends to batter and damage various parts of the total assembly.

One purpose of the cushion mechanism is to resist this "overrunning" and to cushion it. Since the cushion 26 is contacted by the link 19 well before the completion of the tip, further movement of the parts in the tipping direction is accomplished only by compression or yielding of the cushion 26. As above set out, this member is of rubber or generally equivalent material, and it is relieved along its sides by grooves 28 which are preferably at right angles to the bottom of the channel which forms the link 25. As the movement of the tip continues from the point of first contact of the link 19 with the edge 30 of the cushion 26, some flow of the cushion member occurs and gradually it flows into the grooves 28 which may be wholly or partially filled. Ordinarily, when the body has moved to the full tipped position, these grooves have been completely filled.

As the mechanism moves to the full tipped position and the cushion is distorted as above described, compression is built up in the cushion and, when the body is reversed for return to the untipped position, the cushion member tends to expand and to assist the return of the body. The cushion member thus provides a means for preventing "run away," means for cushioning the movement in the tipping direction and means for assisting or initiating movement in the return direction. As movement in the return direction occurs, first, the cushion is permitted to expand and the grooves 28 again reappear and, finally, the link 19 moves out of contact with the surface 30 and with the cushion 26. In the description above, the cushion 26 and the link 19 have been described in the singular. Obviously, in the present form, there are two. There might be only a single link and there might be more than two.

I claim:

1. In combination in a linkage, two hinged members and two movable links, said links being mounted for movement with relation to said hinged members, means for moving said links toward each other, and means for yieldingly resisting and for cushioning their movement, said means including a cushion member positioned on one of said links, said cushion being provided with a face adapted to be contacted by the other of said links, said cushion being shaped to provide portions of reduced width.

2. In combination in a linkage, two hinged members and two movable links, said links being mounted for movement with relation to said hinged members, means for moving said links toward each other, and means for yieldingly resisting and for cushioning their movement, said means including a cushion member positioned on one of said links, said link shaped to surround said cushion in part, said cushion being provided with a face adapted to be contacted by the other of said links, said cushion being shaped to provide portions of reduced width.

3. In combination in a linkage, two movable links, means for moving them toward each other, and means for yieldingly resisting and for cushioning their movement, said means including a cushion member positioned on one of said links, said link shaped to surround said cushion in part, said cushion being provided with a face adapted to be contacted by the other of said links, said cushion being shaped to provide portions of reduced width, said portions being out of contact with the surrounding link parts, and extending into that part of said cushion which is surrounded in part by said link.

4. In combination in a linkage, two movable links, means for moving them toward each other, and means for yieldingly resisting and for cushioning their movement, said means including a cushion member positioned on one of said links, said cushion being provided with a face adapted to be contacted by the other of said links, said cushion being shaped to provide portions of reduced width, said portions of reduced width comprising groove like parts and extending in a direction substantially opposite to the direction of movement of said links when they approach each other.

5. In combination in a linkage, two movable links, means for moving them toward each other, and means for yieldingly resisting and for cushioning their movement, said means including a cushion member positioned on one of said links, said link shaped to surround said cushion in part, said cushion being provided with a face adapted to be contacted by the other of said links, said cushion being shaped to provide portions of reduced width, said portions being out of contact with the surrounding link parts, said portions of reduced width comprising groove like parts and extending in a direction substantially opposite to the direction of movement of said links when they approach each other.

6. In combination in a vehicle tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for causing said tipping movement, said means including links, one of said links being of channel section, another of said links adapted, during the tipping movement, to move into said channel, and deformable means positioned in said channel to be contacted by said entering member during the progress of the tip and adapted to be compressed between said two members during a latter portion of said tipping movement.

7. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for causing said tipping movement, said means including a plurality of links, two of said links, during the tipping movement, being caused to move toward each other, and cushioning means formed of resilient material interposed between said links, said cushioning means being of such size that during the latter

part of the tip it is in contact with both of said links and is deformed thereby.

8. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for causing said tipping movement, said means including a plurality of links, two of said links, during the tipping movement, being caused to move toward each other, and cushioning means formed of resilient material interposed between said links, said cushioning means being of such size that during the latter part of the tip it is in contact with both of said links and is deformed thereby, said cushioning member being shaped to provide portions of reduced width.

9. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for causing said tipping movement, said means including a plurality of links, two of said links, during the tipping movement, being caused to move toward each other, and cushioning means formed of resilient material interposed between said links, said cushioning means being of such size that during the latter part of the tip it is in contact with both of said links and is deformed thereby, said cushioning member being shaped to provide portions of reduced width, the longitudinal axes of said portions being generally opposite to the direction of movement of said links as they move toward each other.

10. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for causing said tipping movement, said means including a plurality of links, two of said links, during the tipping movement, being caused to move toward each other, and cushioning means formed of resilient material interposed between said links and carried by one of them, said cushioning means being of such size that during the latter part of the tip it is in contact with both of said links and is deformed thereby.

11. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for causing said tipping movement, said means including a plurality of links, two of said links, during the tipping movement, being caused to move toward each other, and cushioning means formed of resilient material interposed between said links and carried by one of them and partially enclosed by said link, said cushioning means being of such size that during the latter part of the tip it is in contact with both of said links and is deformed thereby.

12. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and means for causing said tipping movement, said means including a plurality of links, two of said links, during the tipping movement, being caused to move toward each other, and cushioning means formed of resilient material interposed between said links and carried by one of them, and partially enclosed by said link, said cushioning means being of such size that during the latter part of the tip it is in contact with both of said links and is deformed thereby, said cushioning member being shaped to provide portions of reduced width, the longitudinal axes of said portions being generally opposite to the direction of movement of said links as they move toward each other.

13. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping with respect thereto, and power means for causing said tipping movement, and means associated with said power tipping means for preventing overrunning in the tipping direction, said last mentioned means including a restraining member comprising a mass of readily deformable resilient compressible material, said power tipping means including relatively rigid parts positioned about said resilient material and limiting the extent and direction of its deformation during the tipping movement.

14. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for positively causing said tipping movement, and means comprising a restrainer against involuntary tipping movement of the body, when partially tipped, said restraining means being formed of a mass of readily deformable and compressible material, and means partially enclosing said mass of readily deformable and compressible material, said enclosing means forming a part of said tipping means.

15. In combination in a vehicle tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for causing said tipping movement, said means including links, one of said links being of channel section, another of said links adapted, during the tipping movement, to move into said channel, and rubber means positioned in said channel to be contacted by said entering member during the progress of the tip and adapted to be pressed between said two members during a latter portion of said tipping movement.

16. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for causing said tipping movement, said means including a plurality of links, two of said links, during the tipping movement, being caused to move toward each other, and cushioning means formed of rubber material interposed between said links, said cushioning means being of such size that during the latter part of the tip it is in contact with both of said links and is deformed thereby.

17. In combination in a tipping mechanism, a support, a load-carrying member mounted thereon for tipping movement with respect thereto, and power means for causing said tipping movement, said means including a plurality of links, two of said links, during the tipping movement, being caused to move toward each other, and cushioning means formed of compressible material interposed between said links and carried by one of them, said cushioning means being of such size that during a substantial part of the latter part of the tip it is in contact with both of said links and is deformed thereby.

LESTER W. WACHTER.