

Dec. 7, 1937.

W. S. HOWARD

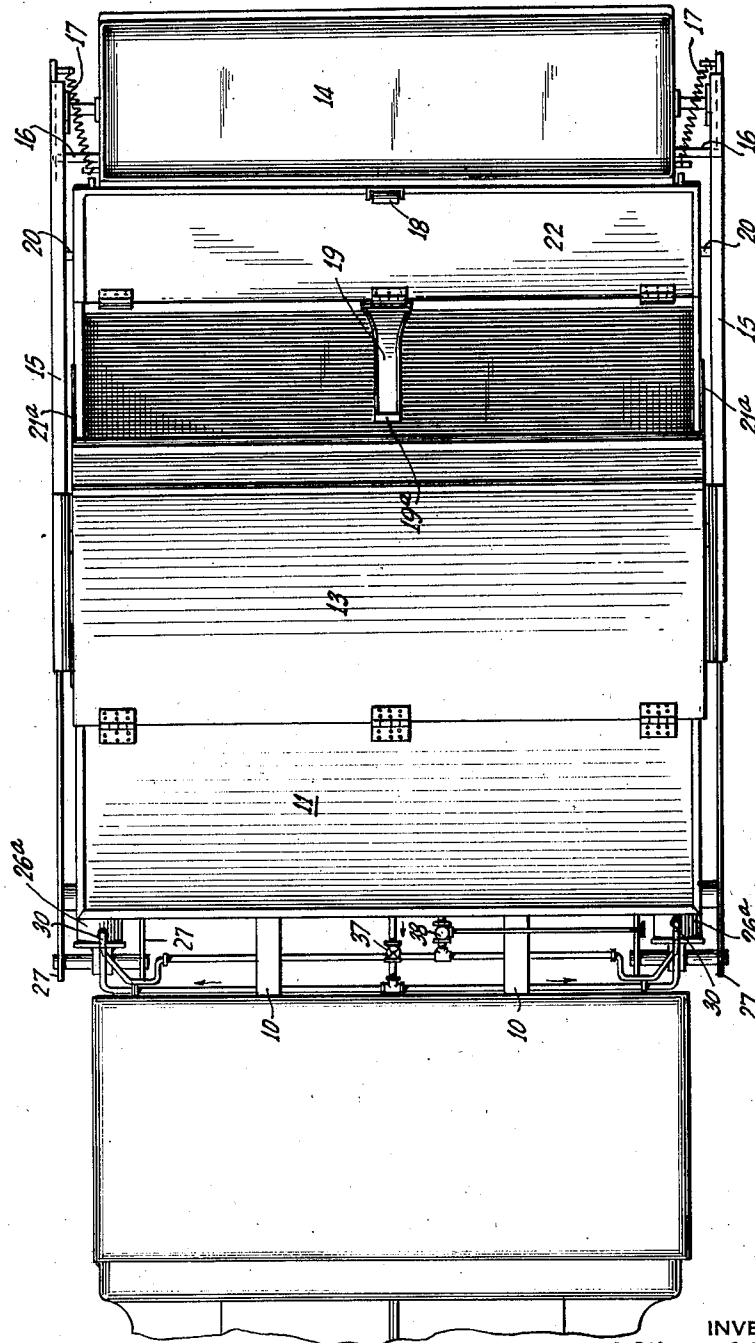
2,101,067

MATERIAL HANDLING APPARATUS

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Fig. 2.



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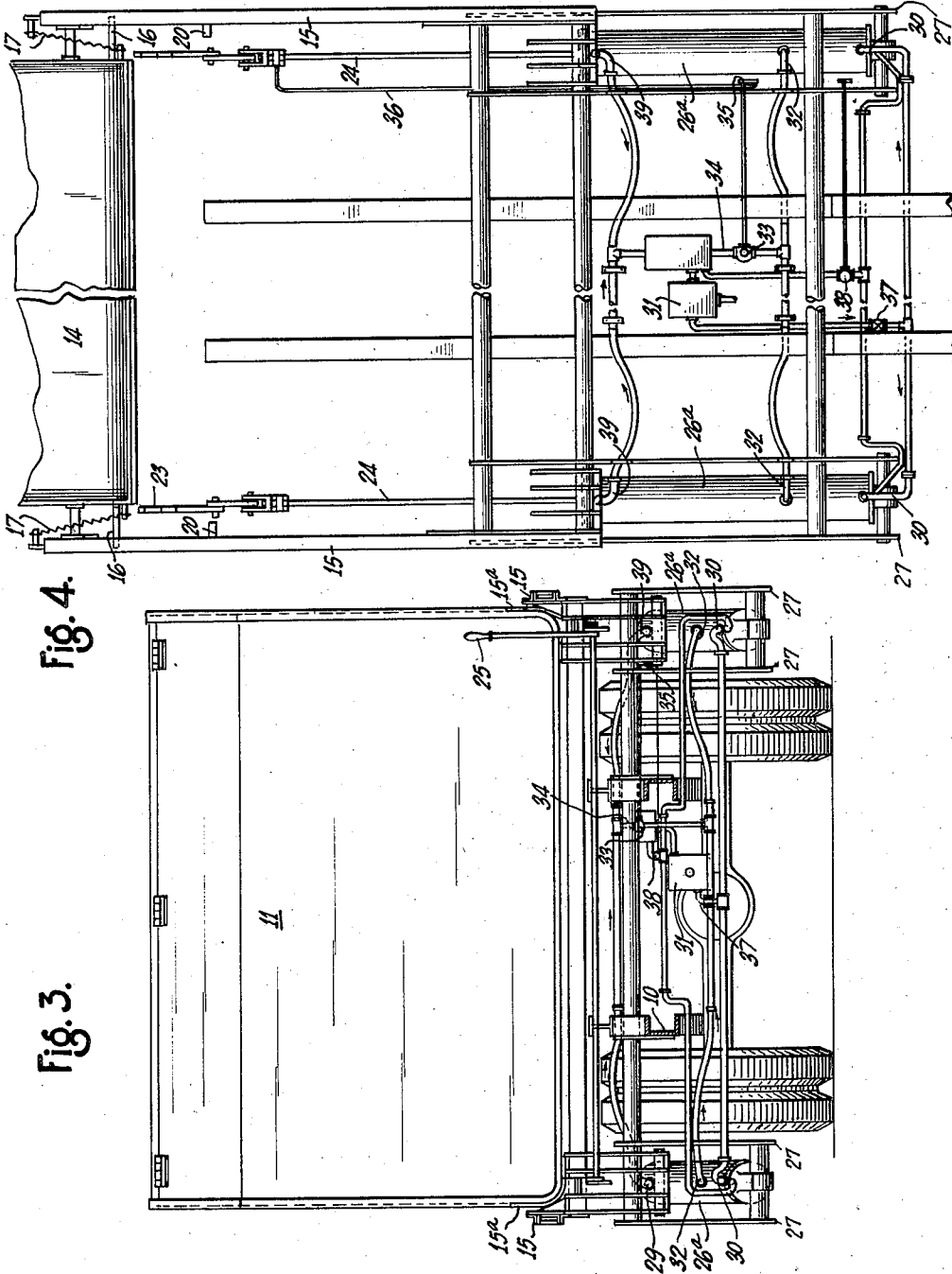


Fig. 4.

Fig. 3.

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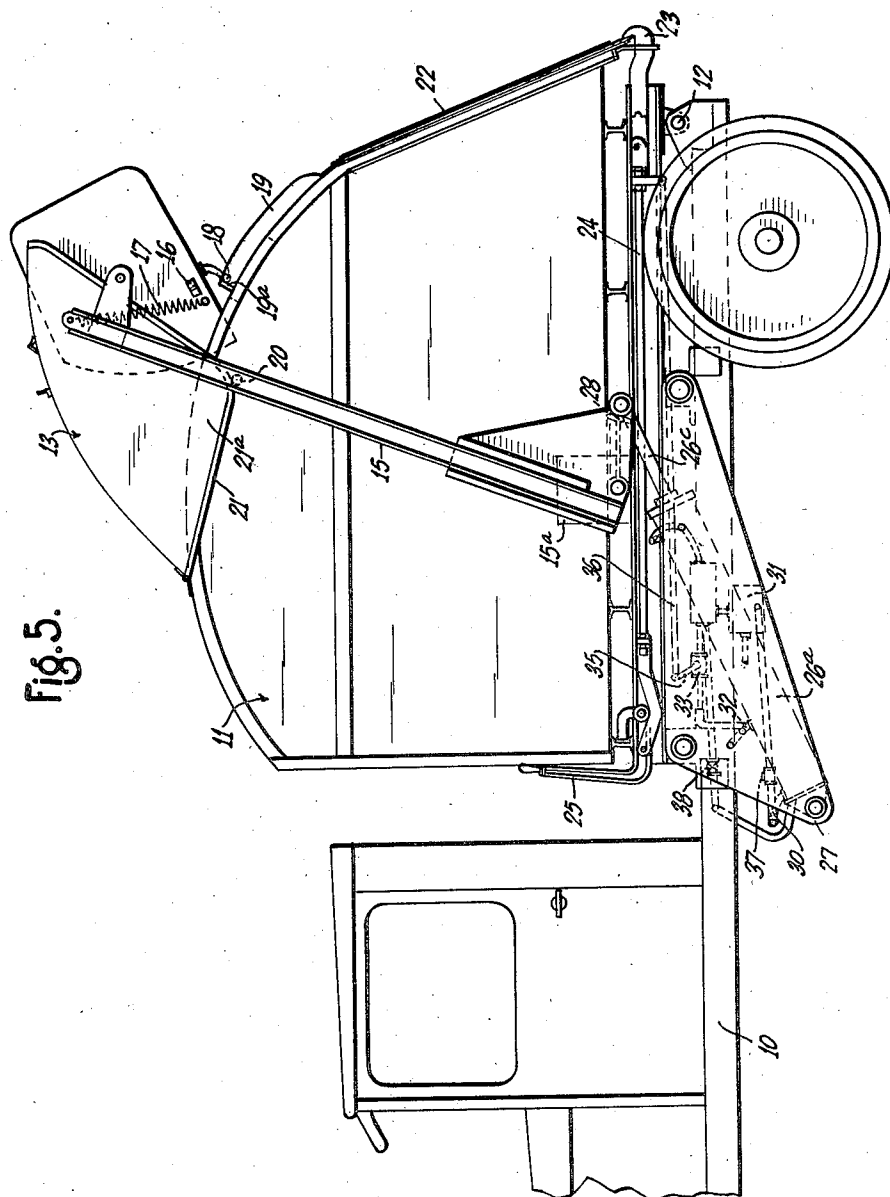


Fig. 5.

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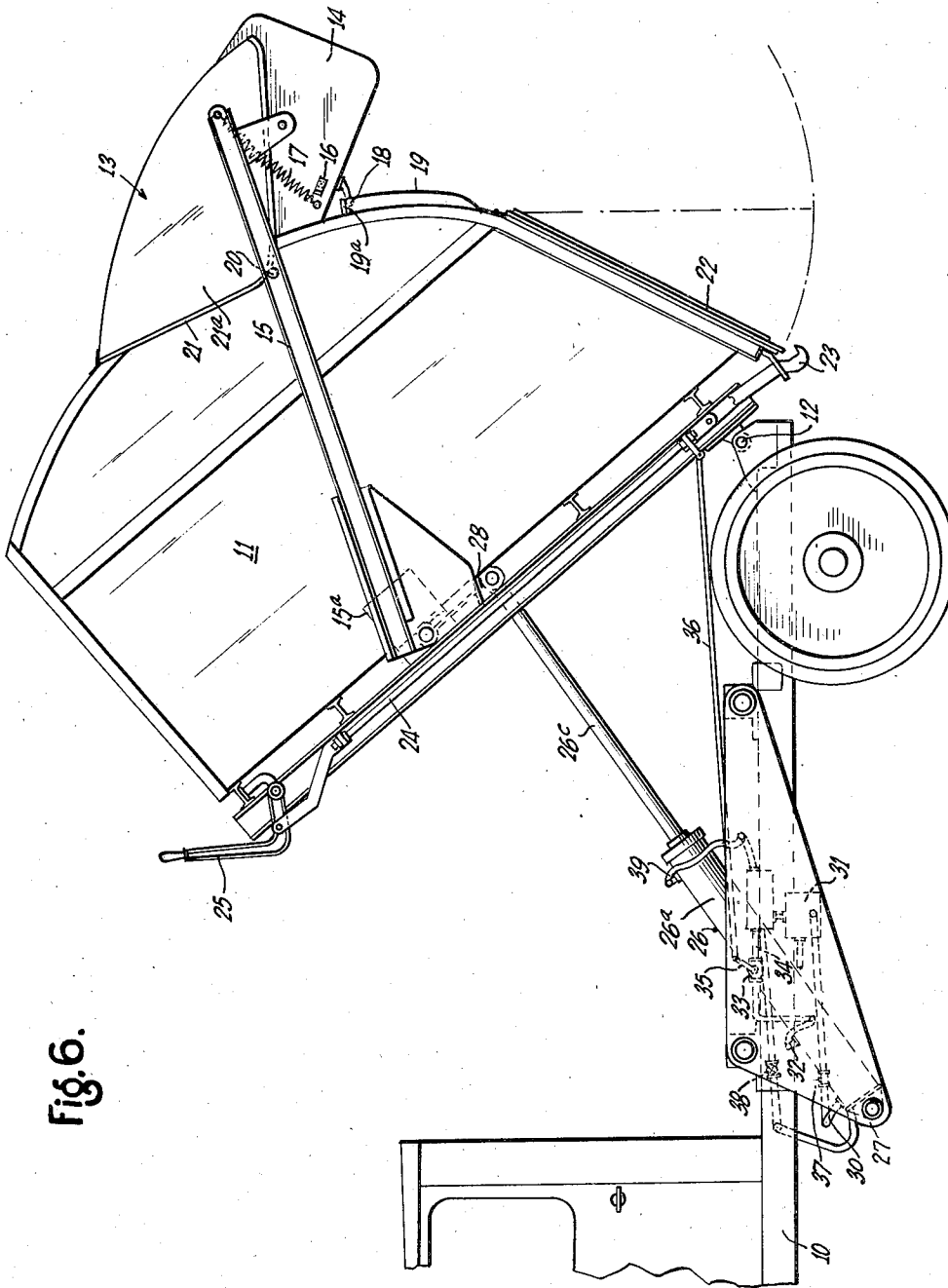


Fig. 6.

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UNITED STATES PATENT OFFICE

2,101,067

MATERIAL HANDLING APPARATUS

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Application October 22, 1935, Serial No. 46,063

7 Claims. (Cl. 214—77)

This invention relates to material handling apparatus especially to motor vehicles for collecting and disposing of ashes, refuse and the like and has for an object the provision of improvements in this art. More particularly the invention has for an object the provision of a dual purpose power lift device designed to load material into the body of the vehicle or selectively to raise the body for dumping. The invention will be best understood from a description of an illustrative embodiment thereof given with reference to the accompanying drawings thereof wherein:

Fig. 1 is a side elevation of a motor truck equipped with mechanism according to the present invention;

Fig. 2 is a top plan view;

Fig. 3 is a front end elevation partly in section taken on the line 3—3 of Fig. 1;

Fig. 4 is a plan view of parts beneath the body;

Fig. 5 is a side elevation similar to Fig. 1 showing the bucket in elevated position; and

Fig. 6 is a similar view showing the body in dumping position.

Referring to the drawings, the chassis 10 of a motor vehicle provided with power take-off mechanism has a closed collection body 11 mounted thereon so as to tilt about aligned journals 12 at the rear.

The body is adapted to be loaded from the top and rear and for this purpose is provided with an opening closed by a hinged cover 13.

Material is adapted to be loaded into the body by a bucket 14 carried by the rear ends of a pair of swinging arms 15. The arms are journaled to the body at their inner ends upon mountings 15a and at their outer ends are journaled to the ends of the bucket. The bucket may be held in upright position for loading material into it by stops 16 and springs 17. The bucket is free to turn in the direction to take the stops 16 away from the arms to empty the bucket into the body.

There are mating parts 18, 19 on the bucket and body for causing the bucket to turn over for emptying.

The part 18 on the bucket is formed as a lug near the center of its length on the edge adjacent the body and the part 19 is formed as a guide secured on the top of the body just below the opening 13. The guide receives the lug 18 and is provided with a stop 19a at its upper end to engage the lug to cause the bucket to be dumped. The central location of the lug and guide provide proper operation at all times even when the body is in an inclined position.

There are also mating parts 20, 21 on the arms and cover for raising the cover as the bucket approaches emptying position. The parts 20 on the arms comprise studs, which may be provided with rollers, which engage the angle irons 21 formed on the ears 21a provided on the cover.

The body is provided with a rear door 22 hinged at the top and held closed by latches 23 at the bottom. The latches are operated by rods 24 and hand levers 25.

The arms and the body are raised by fluid actuated devices 26 each comprising a cylinder 26a pivoted upon the mounting 27 on the chassis, a piston 26b, and a piston rod 26c pivoted to a short arm 28 secured to the inner end of the bucket arm. The cylinder is provided at its pivoted end with an inlet port served by a conduit 30 from a pump 31. The cylinder is provided with an outlet 32 intermediate the ends thereof. The outlet 32 is controlled by a valve 33 in the conduit 34 leading back to the pump supply. The valve and port are normally open and in this condition the bucket is operated. When the piston has moved through a stroke long enough to carry the bucket to its emptying position the piston uncovers the outlet 32 and permits motive fluid to flow to exhaust. This action prevents the piston from moving further.

By closing the valve 33 the piston is caused to travel a greater distance in the cylinder to raise the body. Usually this elevation of the body is only required when the load of material is being dumped from the body, so as a matter of convenience and safety the valve 33 may be controlled in conjunction with the operation of the door latches. As shown, the valve handle 35 may be connected by a rod 36 to the operating linkage for one of the latches.

After the piston has carried the bucket to its uppermost position the elbow between the piston rod 26c and the short arm 28 will, if full stroke of the piston is permitted, come into contact with parts on the body and raise the body to dumping position. The bucket is raised and held in its uppermost position beneath the cover while the body is being dumped. When the truck is travelling short distances during loading the bucket may be carried in its lowermost position in which its operating arms rest upon fixed supports on the body. When the truck is travelling longer distances it is preferred to carry the bucket in an elevated position, as for example just above the top of the rear door and below the cover of the body. This may be accomplished by leaving the cylinders partly filled with fluid, the same being locked therein between a check valve 37 from the pump and the main exhaust valve 38 which is kept closed at this time.

A conduit 39 is provided in the outer ends of the cylinder to permit fluid to escape back to the pump supply when the pistons reach their extreme outer positions as when raising the body.

The operation of the device is indicated in Figs. 1, 5 and 6. When the vehicle is stopped at a loading place the bucket 14 is down. It may also be left down if desired when moving from

place to place during loading. When the bucket has been loaded the pump is started and forces fluid from the usual reservoir to the cylinders 26a. The exhaust valve 38 is closed at this time and the check valve 37 retains the fluid in the cylinders even if the pump is stopped. The fluid entering the cylinders forces the pistons 26b and the piston rods 26c outward and raises the bucket. As the bucket approaches its upper position the studs 20 engage the ears 21a and raise the cover. Finally the bucket member 18 engages the stop 19a and causes the bucket to dump its contents into the opening of the body. Assuming the valve 33 to be open, fluid will flow out the intermediate outlets 32 to the pump reservoir after the pistons uncover the inner end of the outlets 32. To return the bucket the main exhaust valve 38 is opened and the pump stopped. If it is desired to leave the bucket in upper position the valve 38 is left closed, or opened to let the bucket down part way to any desired riding position and then closed, the bucket riding on the check valve 37. The pump may be stopped at this time.

To raise the body the valve 33 of the intermediate outlets is closed to cause the pistons to be forced to the end of their stroke, the bucket first being raised and the body being raised thereafter in the continued movement of the pistons after the ends of the piston rods come against the under side of the body. The outlets 39 at the ends of the cylinders permit fluid to flow to exhaust when the body has been fully raised to prevent breakage. The body is returned by opening either the valve 33 or the main exhaust valve 38.

While one embodiment of the invention has been described in particular to illustrate the invention, it is to be remembered that the invention may have various embodiments within the limits of the prior art and the scope of the subjoined claims.

I claim:

1. Apparatus for handling material comprising in combination, a chassis, a body tiltably mounted thereon, a loading device mounted to operate between a lower position where it receives material and an upper position where it loads the material into the body, a power device for operating said loading device and tilting said body, said power device having a primary range of action for operating said loading device and a secondary and greater range of action including said primary range of action, and in the same direction, for raising said body, and means for selectively conditioning said power device to act through the primary or the secondary range of action and to automatically cut off the application of power when the selected range of action has been attained.
2. Apparatus for handling material comprising in combination, a chassis, a body tiltably mounted thereon, a loading device mounted to operate between a lower position where it receives material and an upper position where it loads the material into the body, a power device for operating said loading device and tilting said body, said power device having a primary range of action for operating said loading device and a secondary and greater range of action including said primary range of action, and in the same direction, for raising the body, means for rendering the power supply to said power device ineffective beyond the primary range of action, and means rendering said first means ineffective

whereby the power device may act through the secondary range of action and to automatically cut off the application of power when the selected range of action has been attained.

3. Apparatus for handling material, comprising in combination, a chassis, a body tiltably mounted thereon, a loading device including arms pivoted to the body operable between a lower position where it receives material and an upper position where it discharges material into the body, a rod for operating said arms and for tilting said body, a power device for actuating said rod, said power device having a primary range of movement for actuating said rod for raising said arms and loading device and a secondary and greater range of movement including said primary range of action, and in the same direction, for actuating said rod for raising the body, and means for selectively conditioning said power device to act through the primary or secondary range of movement and to automatically cut off the application of power when the selected range of movement has been attained.

4. Apparatus for handling material comprising in combination, a chassis, a body tiltably mounted thereon, a bucket-supporting loading device including loading arms pivoted to the sides of the body operable between a lower position where it receives material and an upper position where it discharges material into the body, short arms mounted to turn about the pivot axis of said loading arms, means for connecting said short arms to said loading arm, cooperating piston and cylinder members, one of said members being connected to said short arms, means to supply and exhaust motive fluid between said piston and cylinder members, and controllable means to exhaust fluid when the piston passes a given point in the cylinder whereby to provide a short stroke for raising the loader and a long stroke for raising the body.

5. Apparatus for handling material comprising in combination, a chassis, a body tiltably mounted thereon, a door for dumping material from said body, latches for holding said door closed, means for operating said latches, a body loader, a power device on said chassis having a short range of movement for operating said body loader and a greater range of movement including said primary range of action, and in the same direction, for raising said body, and means interlocked in operation with said latch operating means for selectively causing said power device to operate through the long range to raise the body when the latch is moved to open the door of the body.

6. Apparatus for handling material, comprising in combination, a dump body, a cover operably mounted thereon, a loading device mounted on arms pivoted to said body, depending ears on said cover having cam-like edges, and studs on said arms engageable with said cam-like edges to raise the cover when the arms are raised.

7. Apparatus for handling material, comprising in combination, a dump body, a loading opening in the top thereof, a tiltable bucket loader mounted to move up and down relative to the body, and means to cause said bucket to tilt to load material into said opening, said means comprising a lug near the center of the inside edge of the bucket, a guide mounted on the body and a stop in said guide for engaging the lug on the bucket to cause the bucket to be tilted into said opening.

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