Oct. 24, 1944. P. J. GRATTAN 2,360,870

ROAD SANDING DEVICE

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Fig. 1

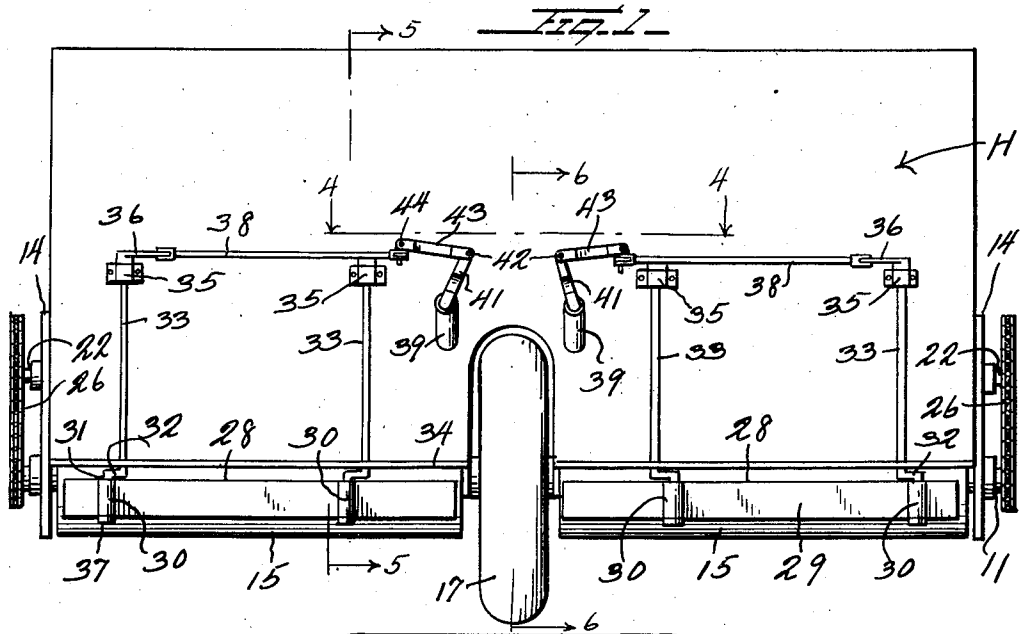


Fig. 2

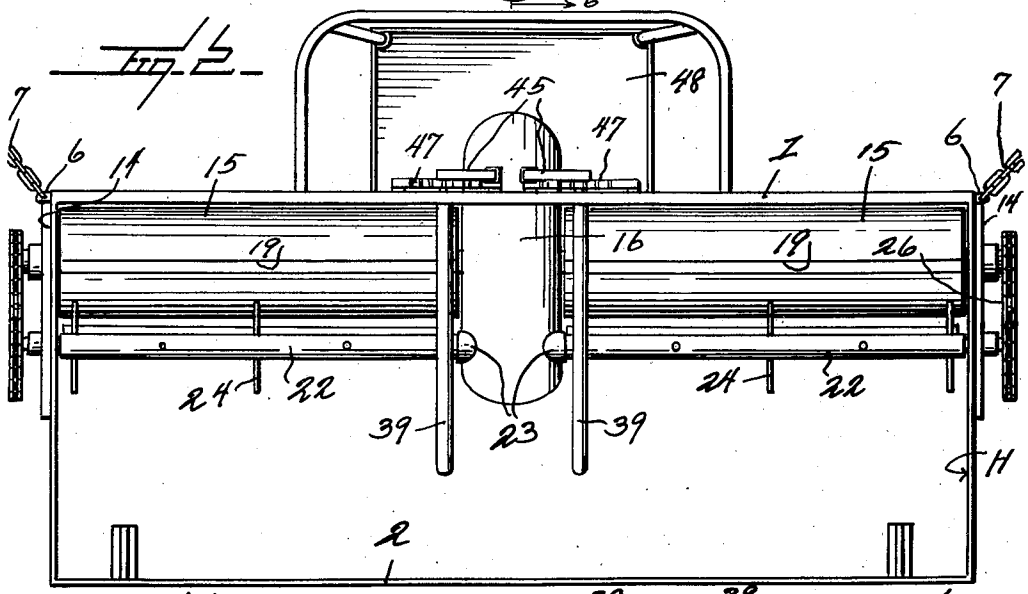


Fig. 3

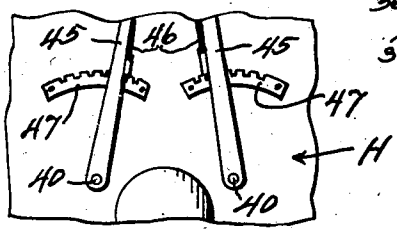
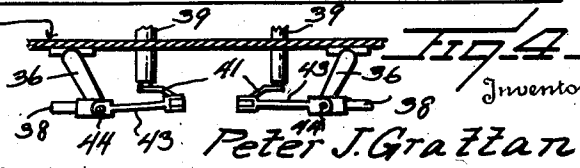


Fig. 4



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Fig. 5.

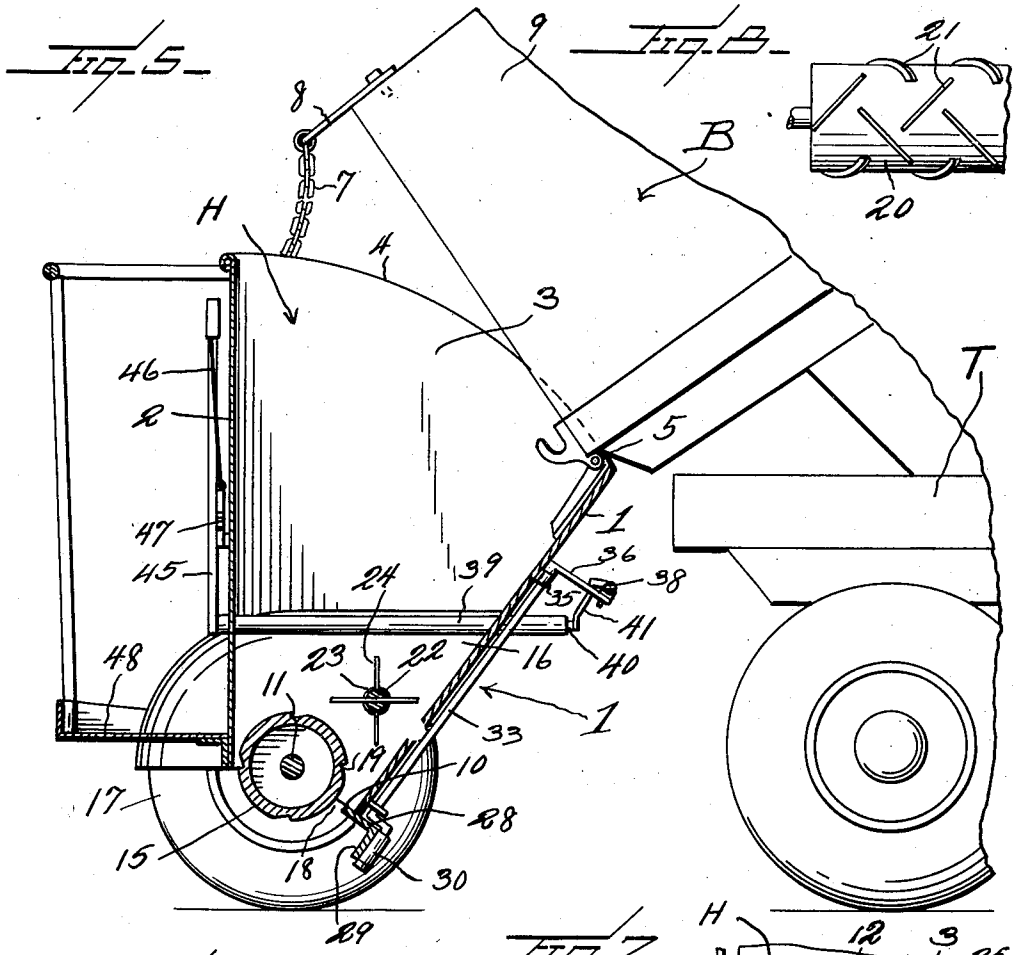


Fig. 8.

Fig. 6.

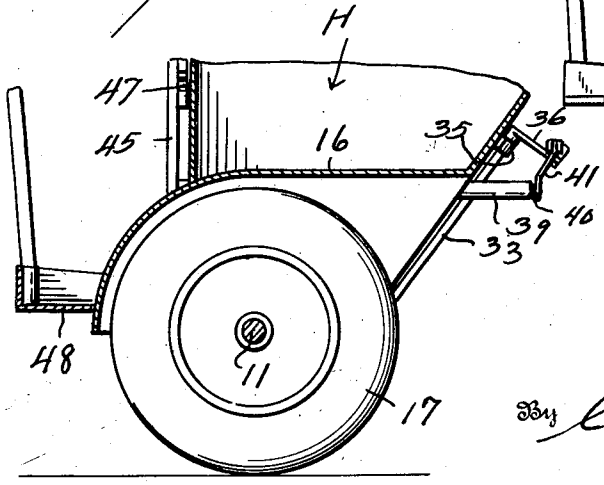
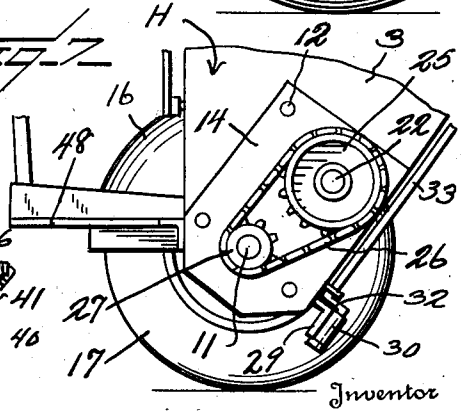


Fig. 7.



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UNITED STATES PATENT OFFICE

2,360,870

ROAD SANDING DEVICE

Peter J. Grattan, Minneapolis, Minn.

Application January 23, 1943, Serial No. 473,381

5 Claims. (Cl. 275—2)

This invention relates to a road sanding device, and it is primarily an object of the invention to provide a device of this kind which constitutes a trailer spreader for a dump vehicle.

The invention also has for an object to provide a device of this kind which includes a ground engaging supporting wheel which also constitutes a source of power for operating the discharge cylinder mounted for operation within the hopper body of the device.

Another object of the invention is to provide a device of this kind which is adapted to be coupled to the rear or discharge end of the tilting body or box of a dump truck, said coupling lifting the device into an ineffective position when the dump body or box is lowered but being in effective working position when the dump body or box is raised for discharging its contents within the hopper body of the device.

A still further object of the invention is to provide a spreading device adapted to be coupled to the rear of a dumping vehicle and wherein a valve mechanism is provided to regulate or control the discharge from the hopper truck of the device and also wherein means are provided to allow the operator of the valve to be carried directly by the device.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved road sanding device whereby certain important advantages are attained, as will be hereinafter more fully set forth.

In order that my invention may be better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a view in front elevation of a road sanding device constructed in accordance with an embodiment of my invention, the line of sight being indicated by the arrow 1, Figure 5.

Figure 2 is a view in top plan of the device as illustrated in Figure 1.

Figure 3 is a fragmentary detailed view in rear elevation illustrating the operating levers for the valves as herein embodied.

Figure 4 is a detailed view, partly in section and partly in top plan, the line of section being substantially on the line 4—4 of Figure 1.

Figure 5 is a vertical sectional view taken substantially on the line 5—5 of Figure 1, looking in the direction of the arrows.

Figure 6 is a detailed vertical sectional view on the line 6—6 of Figure 1.

Figure 7 is a fragmentary view in side elevation illustrating a driving means for a discharge cylinder, and

Figure 8 is a fragmentary view in elevation illustrating a discharge cylinder constructed in accordance with another embodiment of my invention.

As disclosed in the accompanying drawings, my improved sand spreading device comprises a hopper H of desired dimensions and capacity but which is of a size to extend entirely across the rear end of the tilting body or box B of a conventional dumping truck T. This hopper H has its front and rear walls 1 and 2 respectively upwardly diverging so that the open top of the hopper is of considerable width. Each of the side walls 3 of the hopper has its upper or free marginal portion disposed on an upward curvature, as at 4.

The upper portion of the inner or front wall 1 of the hopper H is hingedly connected, as at 5, to the lower portion of the rear or dumping end of the body or box B, so that the hopper H is free to have swinging movement with respect to the body or box B. The rear wall 2 at each upper corner thereof is herein disclosed provided with an outstanding lug 6 to which is suitably anchored an extremity of a flexible member 7, such as a chain.

The opposite extremity of each of these members or chains 7 is suitably anchored to a suitable bracket 8, herein disclosed as anchored to the upper edge of the side wall 9 of the body or box B. Each of the members or chains 7 is of a length to lift or swing the hopper H upwardly when the body or box B is in its lowermost position, whereby the hopper H and the parts carried thereby are raised and maintained in an effective position.

The bottom 10 of the hopper H is open and supported by the side walls 3 of the hopper is a shaft 11. This shaft 11 bridges the space between the side walls 3 and extends outwardly beyond each of said side walls. As is particularly illustrated in Figure 7, the outer face of each of the side walls 3 at its outer portion has suitably anchored thereto, as at 12, a reinforcing or bearing plate 14. This shaft 11 is to one side of the transverse center of the open bottom 10 toward the rear wall 2 of the hopper and mounted upon opposite end portions of the shaft 10 for rotation therewith are the discharging cylinders 15.

Each of these cylinders 15 is of a length to extend from closely adjacent an end wall 3 of the hopper to a point closely adjacent to a down-

wardly facing housing 16 at substantially the longitudinal center of the hopper H. This housing 16 extends from the front wall 1 of the hopper H to and outwardly beyond the rear wall 2, as is clearly illustrated in Figures 2, 5 and 6.

Extending upwardly from below within this housing 16 is a ground engaging and supporting wheel 17 of desired dimensions which is fixed on the central portion of the shaft 11 for rotation therewith. When the wheel 17 is in contact with the road surface, the cylinders 15 will be rotated in a direction to assure proper discharge of the sand within the hopper H upon the roadway.

As particularly illustrated in Figure 5, it is to be noted that the position of the shaft 11 and the major radius of each of the cylinders 15 are such as to bring the periphery of the cylinder 15 closely adjacent to the lower edge of the rear wall 2 of the hopper but having said periphery of the roller 11 spaced from the lower edge of the front wall 1 of the hopper sufficient to provide a discharge slot 18 for the sand.

To facilitate the discharge of the sand within the hopper out through the slot 18, each of the cylinders 15 is provided in its periphery with the longitudinally disposed grooves 19. However, if preferred, a cylinder 20, such as illustrated in Figure 8, may be employed. This cylinder 20 is provided on its periphery at spaced points therealong with the diagonally disposed outstanding ribs 21. The ribs 21 are arranged in rows lengthwise of the cylinder 20 with the ribs 21 of one row substantially aligned and with the ribs of adjacent rows staggered and in substantially right angular relation.

At each side of the housing 16, and herein disclosed as above a cylinder 15, is a shaft 22. This shaft is rotatably supported at one end, as at 23, by a side wall of the housing 16 and the opposite end thereof is supported by and extends outwardly beyond the side wall 3. Radiating from this shaft 22 at desired points therealong are the fingers 24.

The extended end portion of the shaft 22 has fixed thereto a sprocket wheel 25 around which passes an endless sprocket chain 26 which is also disposed around a sprocket wheel 27 fixed to rotate with the adjacent extended end portion of the shaft 11. When the shaft 11 is in rotation, the shaft 22 is also rotated so that the outstanding ribs 21 serve to effectively agitate the sand within the hopper H above the opening or discharge slot 18 to insure effective flow of the sand out through the discharge slot 18.

It is to be pointed out that when the truck body or box B is in its lowered position, the resultant raising of the hopper H lifts the wheel 17 out of rolling contact with the road surface so that the device is entirely inoperative. However, upon proper tilting of the body or box B, as illustrated in Figure 5, the wheel 17 will be brought into contact with the road surface so that as the device trails along behind the truck T, the desired rotation of the wheel 17 will be effected. It is also to be pointed out that the swinging or pivotal connection between the hopper H and the body or box B allows the wheel 17 and, of course, the hopper H to readily raise and lower over any inequalities which may be encountered by the wheel on the road surface and also allows for selective tilting adjustment of the body or box B as may be required to insure the desired discharge of the sand load within the body or box B into the hopper H. It is also to be pointed out that each of the flexible members or chains 7 is of such length as to allow sufficient looseness when the wheel 17 is in contact with the road surface but to lift the hopper H after the body or box B has been swung downwardly beyond a certain point.

The particular construction of the body or box B, together with the means for raising and lowering the same, forms no part of the present invention and a detailed description and illustration thereof are believed to be unnecessary. It is also to be stated that the body or box B is to be provided with a conventional tail-gate but the same has been omitted from the drawings for clarity of disclosure with respect to the device itself.

It is important that means be provided for regulating or controlling the flow of sand out through the discharge slot 18 at opposite sides of the housing 16. At each side of this housing 16 is an elongated valve plate 28, the same being of a length to substantially bridge the space between a side wall of the hopper H and the opposed side wall of the housing 16. The outer longitudinal marginal portion of the valve plate 28 is defined by a depending flange 29 and at desired points spaced therealong the flange 29 is provided thereacross with the vertically disposed sleeves 30 through which are freely disposed from above the stub shafts 31 carried by and depending from the outer extremities of the crank arms 32. The crank arms 32 are carried by the lower end portions of the vertically disposed shafts 33 rotatably disposed through an outstanding flange 34 carried by the lower part of the front wall 1 of the hopper.

The upper end portion of each of the shafts 33 is rotatably disposed through a bearing 35 suitably secured to the outer face of the front wall 1 and fixed to the shaft 33 above the bearing 35 is an outstanding rock arm 36. The mounting of the rock arm 36 upon the shaft 33 provides means for maintaining the shaft 33 in applied position. The lower portion of each of the stub shafts 31 is provided with an enlargement or head 37 contacting from below with the associated sleeve 30 whereby the valve plate 28 is maintained in applied or working position.

The outer portions of the rock arm 36 carried by the shafts 33 associated with a single valve plate 28 are operatively connected by a cross bar or rod 38 whereby the shafts 33 are caused to rotate in unison and in the same direction, thus enabling the valve plate 28 to be moved inwardly or outwardly as desired.

Interposed between and supported by the front and rear walls 1 and 2 of the hopper H at opposite sides of the housing 16 but closely adjacent to the top thereof are the tubular members 39. These members extend outwardly beyond the walls 1 and 2 of the hopper H and rotatably disposed through each of these tubular members 39 is a shaft 40. The forward end portion of the shaft 40 has fixed thereto an upstanding rock arm 41 to which is operatively connected, as at 42, an end portion of a rigid link 43. The opposite extremity of this link 43 is operatively connected, as at 44, with the adjacent cross bar or rod 38. As is particularly illustrated in Figure 4, the connection 44 includes a pintle which also provides the operative connection between the rod or bar 38 and the adjacent rock arm 36. The rear end portion of each of the shafts 40 has fixed thereto the lower end portion of an upstanding hand lever 45 which provides means whereby the associated shaft 40 may be rotated

as desired to either extend or retract a valve plate **28**.

Each of the hand levers **45** carries a conventional latch mechanism **46** for coaction with the usual rack **47**, herein disclosed as anchored to the outer face of the rear wall **2**.

It is to be particularly pointed out that each of the valve plates **28** can be adjusted independently of the other but it is to be further noted that the operating mechanism for one of the plates **28** is so mounted and arranged with respect to the operating mechanism of the second valve plate **28** to cause both of said plates to move in unison in one direction when the levers **45** are swung away from each other and vice versa.

The rear wall **2** of the hopper H at its lower part carries a platform **48** extending outwardly and rearwardly therefrom and upon which an operator may stand so that he can conveniently operate the levers **45** to adjust the valve plates **28** as may be required and also to allow the operator on the platform **48** to conveniently look down into the hopper H to readily note the extent to which the valve plates may be opened or closed. The occupant of this platform **48** can also conveniently use a hoe or other implement to keep the sand flowing from the raised or tilted body or box B of the dumping truck T.

From the foregoing description it is thought to be obvious that a road sanding device constructed in accordance with my invention in particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

What I claim is:

1. A sand spreading device including a hopper having a discharge opening in its lower portion and including front and rear walls, a shaft extending through the hopper and rotatably supported by said front and rear walls, a valve plate for controlling the flow out through the discharge opening positioned adjacent to the front wall of the hopper, an upwardly disposed shaft rotatably supported by said front wall and having a crank operatively engaged with the valve plate, an operative connection between the upwardly disposed shaft and the adjacent end portion of the first shaft for shifting the valve plate as required upon rocking of the first shaft, and means exteriorly of the hopper and adjacent to the rear wall thereof for rocking the first shaft.

2. A sand spreading device including a hopper having a discharge opening in its lower portion and including front and rear walls, a shaft extending through the hopper and rotatably supported by said front and rear walls, a valve plate for controlling the flow out through the discharge opening positioned adjacent to the front wall of the hopper, an upwardly disposed shaft rotatably supported by said front wall and having a crank operatively engaged with the valve plate, an operative connection between the upwardly disposed shaft and the adjacent end portion of the first shaft for shifting the valve plate as required upon rocking of the first shaft, means exteriorly of the hopper and adjacent to the rear wall thereof for rocking the first shaft, and an outstanding platform carried by the rear wall of the hopper for the operator to rock the first shaft.

3. A portable sand spreading device including a hopper having its bottom open, a downwardly opening housing carried by and extending through the central portion of the hopper between and joining the front and rear walls of the hopper, a shaft rotatably supported by the side walls of the hopper and extending through the housing, a ground engaging wheel mounted on the shaft and extending up within the housing, and discharge cylinders carried by the shaft at opposite sides of the housing and closely adjacent to the open bottom of the hopper.

4. A portable sand spreading device comprising a hopper having downwardly converging front and rear walls, the rear wall being arranged to maintain substantially a vertical position in the operation of the device and the front wall being inclined upwardly and forwardly, the hopper being open at its bottom between the lower edges of the front and rear walls and the lower edge of the front wall being at a lower elevation than the lower edge of the rear wall, a downwardly opening housing extending through the central portion of the hopper between and joining together the front and rear walls of the hopper, a shaft rotatably supported by opposite side walls of the hopper and extending through the housing and lying in the rear portion of the open bottom, a ground engaging wheel mounted upon the shaft and extending up into the housing, a discharge cylinder carried by the shaft at each side of the housing within the open bottom of the hopper and in close proximity upon one side with the rear wall, a valve plate supported for movement across the lower edge of the front wall in a plane substantially perpendicular to the front wall to regulate the opening between the front wall and the adjacent discharge cylinders, and means for shifting said valve plate.

5. A portable sand spreading device as set forth in claim 4, with a platform secured to the rear wall adjacent the lower edge thereof and extending across the width of the hopper.

PETER J. GRATTAN.