Aug. 10, 1937. A. C. COX 2,089,539

SCRAPER

Filed Nov. 3, 1936 2 Sheets-Sheet 1

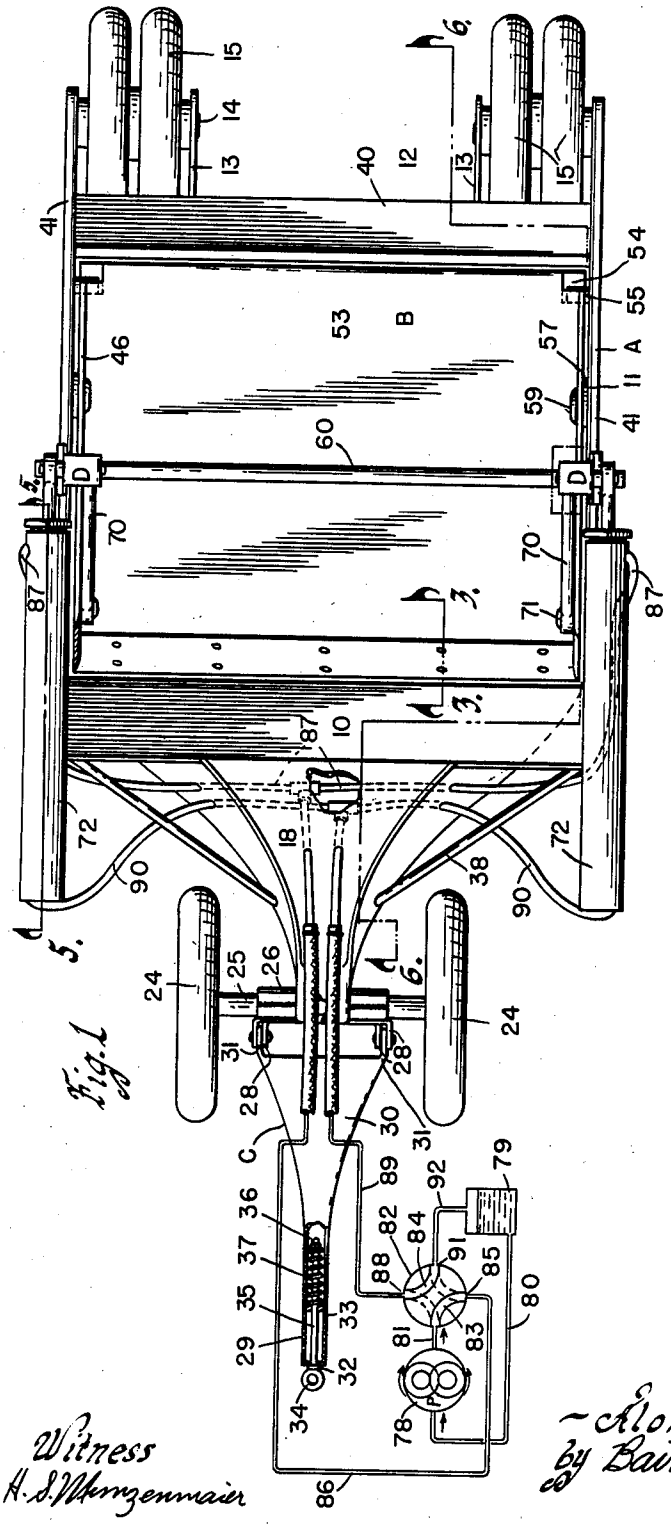


Fig. 1.

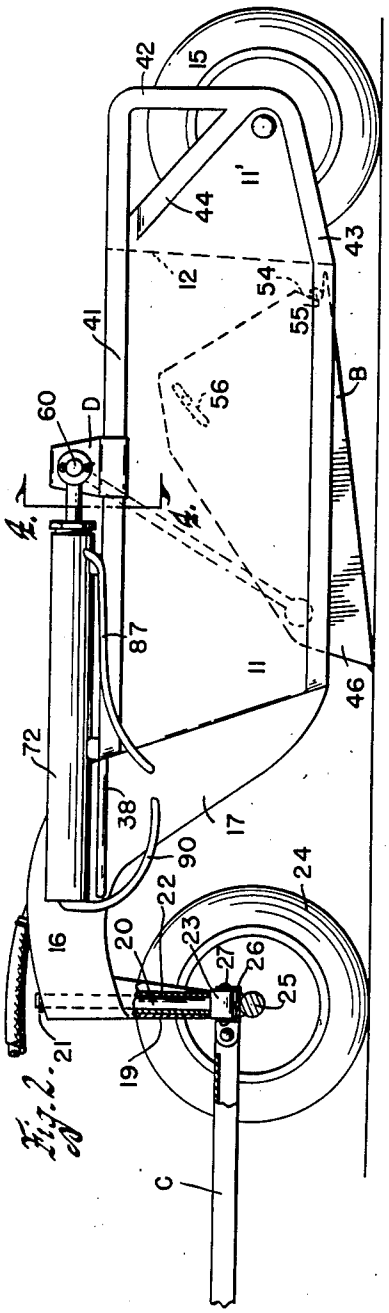


Fig. 2.

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Fig. 3.

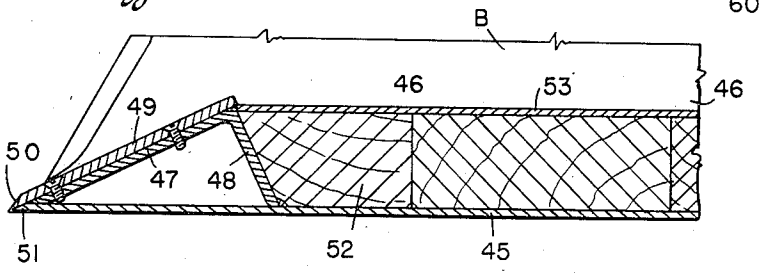


Fig. 4.

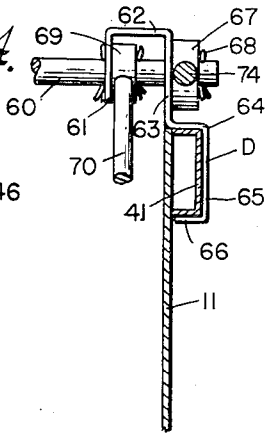


Fig. 5.

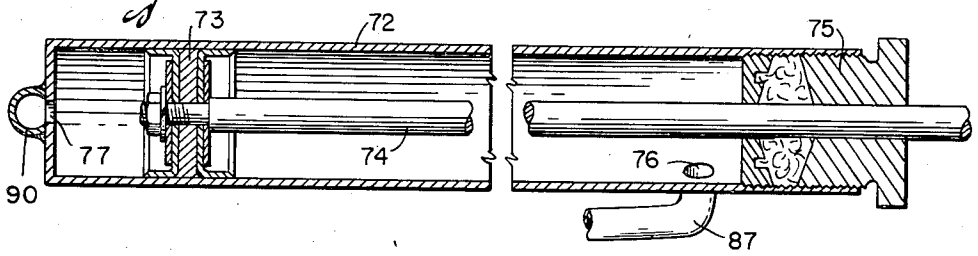
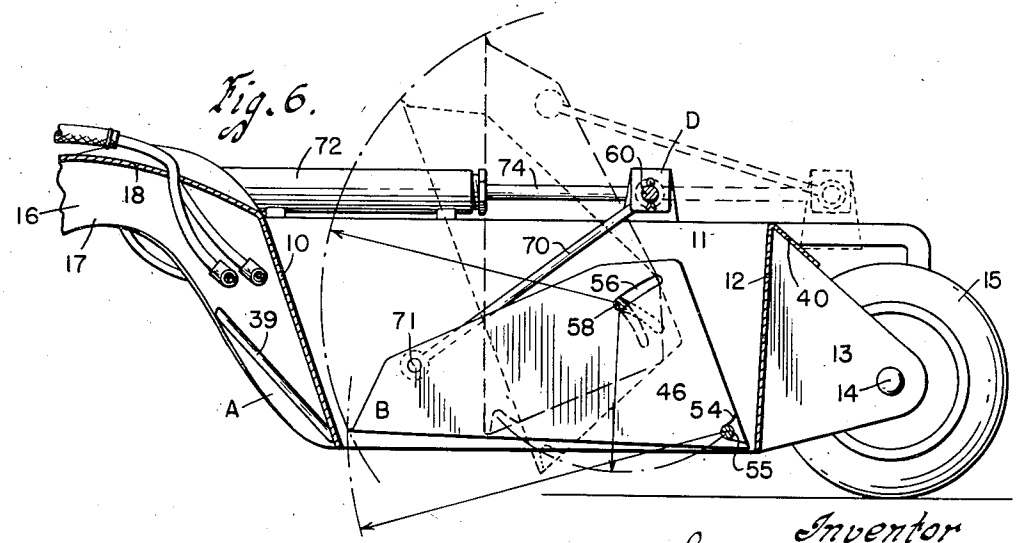


Fig. 6.



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2,089,539

SCRAPER

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Application November 3, 1936, Serial No. 108,961

6 Claims. (Cl. 37—126)

My invention relates to a scraper for earth handling mechanism, of the wheel or scoop type.

The object of my invention is to provide a scraper of the type in which there is a central bowl with a bottom and side walls, which central bowl is arranged to cooperate with relatively fixed front and rear walls supported on a frame and preferably mounted on a carriage.

It is also an important part of my present invention to provide in such a structure as that just described a peculiar means for mounting the bowl for movement and for imparting movement thereto.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my scraper, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a top or plan view of the scraper embodying my invention.

Figure 2 is a side elevation of the same.

Figure 3 is a detail, sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a detail, sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a horizontal, detail sectional view taken on the line 5—5 of Figure 1; and

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

I provide what might be generally called a carriage A in which is mounted the movable bowl B. The carriage A has a part forming what might be described as a box, having a front wall 10 inclined downwardly and rearwardly from its upper edge, spaced side walls 11 and a rear wall 12. The side walls 11 have triangular portions 11' projecting rearwardly beyond the rear wall 12 as indicated for instance in Figure 2, to provide a means for mounting the rear wheels.

Extending rearwardly from the rear wall 12 and spaced inwardly from the respective portions 11' of the side walls 11 are laterally spaced supports 13, having the same general shape as the portions 11'.

At the right and left-hand sides of the machine at the rear thereof, axles 14 are journaled in the side wall portions 11' and the supports 13, as shown for instance in Figures 1, 2 and 6.

On the axles 14 are wheels, preferably the dual wheels 15.

At the front of the carriage A is a goose-neck supporting member 16, having the spaced side flanges 17 and the top member 18. Extending down from the upper front portion of the goose-neck support 16 is a supporting sleeve 19. An upright post 20 is journaled in the sleeve 19 to rotate on a vertical axis, and projects above the upper end of the goose-neck support 16 as indicated in Figure 2.

A cotter pin 21 may be extended through the projecting upper end of the post 20. A long bushing 22 receives the post 20 and is received by the sleeve 19. On the lower end of the post 20 is fixed a horizontal, cylindrical member 23.

The front wheels 24 have the axle 25 to which is fixed an upwardly opening channel 26. The cylindrical member 23 is pivoted lengthwise of its axis between the front and rear walls of the channel 26 as indicated at 27. Laterally spaced pairs of ears 28 extend forwardly from the front wall of the channel 26.

A short tongue C comprises the downwardly opening channel 29 at its forward part and the laterally spreading rearward portion 30, which has the ears 31 journaled between the ears of the respective pairs. The side walls of the front end of the tongue are connected by an end member 32. Rearwardly from the end member 32, the side walls of the portion 29 of the tongue C are connected by a short cross bar or partition 33. An eye-bolt 34 has its shank 35 extended rearwardly through the front wall 32 and the cross bar 33 and has on its rear end a nut 36.

A coil spring 37 is received on the shank 35 between the cross bar 33 and the nut 36. The eye-bolt 34 may be hitched to a tractor, truck or otherwise.

This frame structure may vary quite widely without departing in any way from the important features of my invention. For instance, it may have the braces 38 shown in Figure 2 and the braces 39 such as that shown in Figure 6. Likewise the rear wall 12 may be provided at its upper end with the apron 40, which is secured to the wall portions 11' and members 13 to brace them.

I provide on the outside of the side walls 11 at the top thereof and preferably welded thereto, the inwardly opening channel-shaped bracing members 41. This channel and brace member 41 preferably extend rearwardly beyond the wall member 12 as shown in Figures 1 and 2, and has a portion bent downwardly at its rear end as at 42, joining with a corresponding channel for bracing the lower edge of the wall 11 and its extension 11'.

A similar channel member 44 may be used to brace the upper edge of the wall portions 11' as illustrated in Figure 2. The walls 10 and 12 form the front and rear of the dirt carrying compartment.

Bowl and operating mechanism

I will now describe the movable bowl and the mechanism for operating it. The bowl B has a bottom member 45 of any suitable material, preferably sheet iron, and side members 46.

Assuming that the bottom is substantially level as shown in Figure 6, the rear edges of the side walls 46 are inclined from their lower ends upwardly and forwardly and the side walls 46 taper irregularly toward their forward ends as shown in Figure 6.

At the front part of the bowl, there rests on the bottom 45 the inclined cross plate 47, extending upwardly and rearwardly. At the rear upper end of the plate 47 is a downwardly and rearwardly inclined plate 48, the lower edge of which rests on the bottom 45. The plate 47 is covered by a wear plate 49 preferably of steel, having a sharpened lower edge as at 50. The front edge of the bottom 45 is beveled as at 51 to snugly fit the plate 49 and the lower forward edge of the plate 47 is beveled to fit against the bottom 45. The bottom 45 rearwardly of the plate 48 is covered by a relatively thick bracing cross plank 52 and above the plank 52 slightly below the level of the uppermost edge of the plate 49 is a false bottom plate 53, preferably of sheet metal.

In the rear edges of the side walls 46 at their lower parts and in the rearward plank member 52 are notches 54, which during part of the movement of the bowl B receive and cooperate with pins 55 extending inwardly from the walls 11 at their rearward lower parts (see Figures 1, 2 and 6).

In the side walls 46 at their upper rear parts are slots 56, elongated on the arcs of circles, having their centers at the centers of the pins 55.

The side walls 46 of the bowl are spaced inwardly from the side walls 11 of the box-like portion of the carriage A enough to allow free movement of the bowl.

On the inner surfaces of the side walls 11 are the washers 57. Extending inwardly from the side walls 11 through the washers 57 are pins 58, which project through the elongated slots 56, as shown in Figures 1, 2 and 6 and have on their inner ends the flattened heads 59.

I shall now describe the mechanism for operating the bowl B. Above the walls 11 of the box-like portion of the carriage A is a transverse shaft 60. The ends of the shaft 60 are journaled in brackets D.

Each bracket D has an inner vertical member 61 through which the shaft 60 extends. At the upper part of the member 61 is a horizontal, outwardly extending member 62 from which the member 63 extends downwardly. The member 63 receives the shaft 60.

At the lower end of the part 63 of the bracket D is an outwardly extending, horizontal part 64 resting on top of one of the channel-shaped braces 41 and terminating in a downwardly extending part 65 at the lower end of which is an inwardly extending part 66. The parts 64, 65 and 66 embrace the channel-shaped member 41 and slide thereon.

On the ends of the shaft 60 which project outwardly from the portions 63 of the brackets D are journaled collars 67 held against removal by any suitable means, as for instance the cotter pins 68.

On the shaft 60 between the members 61 and 63 of each of the brackets D is a collar 69. From the respective collars 69 are rods 70, which when the bowl B is in its position shown for instance in Figure 6, extend downwardly and forwardly and are pivoted as at 71 to the inner forward parts of the walls 46. Thus by sliding the shaft 60 backward and forwardly on the channels 41, as guides, the bowl B may be moved to its different operative positions.

For accomplishing this sliding movement of the shaft and for thus actuating the bowl, any suitable means might be employed.

Mounted on the upper edges of the walls 11 at the forward parts thereof and projecting forwardly therefrom are hydraulic cylinders 72 in which are the pistons 73 from which the piston rods 74 extend rearwardly through the packing structures 75 at the rear ends of the cylinders 72 to the collars 69 to which these piston rods are fixed. Oil for example is supplied to the cylinders 72 for actuating the pistons 73.

Near the rear end of each cylinder 72 is a port 76 and at the forward end of each cylinder 72 is a port 77. Suitably located at any particular point as on a tractor or truck is a pump 78, preferably of the rotary type. An oil reservoir 79 is connected with the intake of the pump 78 by a pipe 80. A pipe 81 connects the outlet from the pump 79 with a valve 82.

The valve 82 which is shown somewhat diagrammatically in Figure 1 has passages 83 and 84. One port 85 of the valve 82 is connected by a pipe 86 with branch pipes 87 leading to the ports 76. Another port 88 of the valve 82 is connected by a pipe 89 with branch pipes 90 leading to the ports 77 of the cylinders 72. Still another port 91 of the valve 82 is connected to the top of the reservoir 79 by a pipe 92. The pipe 80 leads from the bottom of the reservoir 79. It will, of course, be understood that the pump 78 may be operated from any suitable source of power.

Operation

I will now describe the practical operation of my machine. Let us assume that the bowl B is substantially in the position shown in Figure 6, which is its load carrying position. In Figure 2, I have shown what is the loading position of the bowl. As a matter of fact for scraping and loading, the front end is lowered a little below its position shown in Figure 2. In order to move the bowl from the full line position of Figure 1 to the position of Figure 2, the operator adjusts the valve 82 from a previous neutral position to the position where the passages 83 and 84 are arranged as shown in Figure 1 in full lines and starts the pump.

Oil is then forced from the reservoir into the rear ends of the cylinders 72 for forcing the piston 73 forwardly and sliding the brackets D forwardly.

The oil in the front ends of the cylinders is simultaneously allowed to flow back to the reservoir 79.

The forward movement of the brackets D and the shaft 60 actuates the rods 70 for moving the bowl from its full line position illustrated in Figure 6 to its position shown in Figure 2.

It will be observed that the parts are so arranged that when the bowl is in load carrying position as illustrated in full lines in Figure 6,

the pins 55 are received in the notches 54 and the rods serve to hold the bowl in position.

It will also be noted that in this position of the bowl, the pins 58 are at the forward ends of the slots 56. When the front end of the bowl is lowered toward loading position, the bowl pivots on the pins 55 and slides on the pins 58.

The parts are also so arranged that the pins 58 will limit the downward tilting movement of the front end of the bowl and thus during the loading operation when the bowl is tilted as far forwardly as possible will cooperate with the rods 70 in taking the strain of the loading operation.

When the bowl is loaded, the operator adjusts the valve 82 from the full line positions of the passages 83—84 illustrated in Figure 1 to the dotted line positions there illustrated, whereupon oil will be pumped from the reservoir 79 through the passage 84 in the pipes 89 and 90 to the forward ends of the cylinders 72 for thereby forcing the pistons 73 rearwardly.

If it is desired to carry the load to some distant point, the operator moves the valve to neutral, when the bowl has reached its load carrying position o Figure 6.

Then the load may be carried to any place desired.

The walls 10 and 12 serve to retain the dirt in the bowl B. When the scraper is hauled to the place where the load is to be discharged, the operator moves the valve 82 from its neutral position to its last-described operating position, whereupon the pistons 73 will be driven farther rearwardly, so that the shaft 60 slides rearwardly and the front end of the bowl is tilted upwardly.

The parts are so arranged that when the front end of the bowl is thus tilted upwardly, the bowl pivots around the pins 58 and entirely leaves the pins 55 as illustrated by the dotted line showings in Figure 6.

It will have been noted that the pins 55 are so arranged that the bowl when in load carrying position cooperates with the wall 12 for holding and carrying the dirt.

When this upward movement of the front end of the bowl from position shown in full lines in Figure 6 occurs, the bowl is moved to unloading position where its lower rear part moves away from the wall 12 to allow the dirt to slide out freely and easily.

There is an advantage in locating the pins 58 forwardly from the wall 12 so that this unloading swinging movement of the bowl is around the pins 58 in their location as shown. With the arrangement here disclosed, there is less danger of any of the dirt sticking in the bowl, than there would be if the bowl were pivoted around an axis closer to the wall 12 than are the pins 58.

It is obvious that many changes could be made in the construction and arrangement of the various parts of my improved scraper and it is my intention to cover by my claims any such changes or modifications as may reasonably be included within the scope of the claims and of the invention.

I claim as my invention:

1. In a scraper structure, a wheeled carriage having parts adapted to serve as the front and back walls of a dirt holding compartment, a bowl having a bottom and side walls, said bowl being mounted to swing to loading, load carrying, and unloading positions, and means for operating said bowl, said means including a shaft at the upper part of the carriage mounted to slide fore-and-aft on the carriage, laterally spaced hydraulic cylinders supported at the sides of the carriage and toward the front thereof, having pistons and having piston rods operatively connected with said shaft, means for actuating said pistons, and means for connecting the shaft with the bowl.

2. In a scraper structure, a wheeled carriage having parts to serve as front and back walls of a dirt holding compartment, a bowl mounted to swing to loading, load carrying and unloading positions, and means for operating said bowl, said means including a transverse shaft, brackets for slidably mounting the ends of said shaft on said carriage, rods pivoted to said shaft adjacent the ends thereof and to the front portion of said bowl, and means for sliding the shaft forwardly and rearwardly.

3. In a scraper structure, a wheeled carriage having parts adapted to serve as front and rear walls of a dirt holding compartment, a bowl, having a bottom and side walls, the side walls having elongated slots at their upper rear parts, pins supported on the carriage spaced forwardly from the upper part of such back wall and projected through said slots, pins projecting from said carriage near the lower part of said back wall, and means for swinging the front end of the bowl, whereby when the bowl is swung from load carrying position to loading position it pivots on said last-named pivots and when it is swung from load carrying position to unloading position it pivots on the first-named pins.

4. In a scraper structure, a wheeled carriage having side walls and parts adapted to serve as front and back walls of a dirt holding compartment, channel-shaped bracing and guide members secured horizontally to the upper parts of said side walls, a transverse shaft, brackets slidably mounted on said channels for fore-and-aft sliding movement, brackets serving as journaling means for the ends of the shaft, means for sliding the shaft rearwardly and forwardly, a bowl, rods pivoted to the shaft and to the front part of the bowl, means for pivoting the rear part of the bowl for movement between load carrying and loading position, pivots for the upper rear part of the bowl spaced forwardly from such rear wall, said bowl having portions slidable on said last-named pivots.

5. In a scraper, a frame, having walls to serve as front and back of a dirt holding compartment, a bowl for cooperating with such walls, and adapted to be swung to loading, load carrying and load discharging position, means for transversely pivoting the bowl at its lower rear part during its movement between loading and load carrying positions, and means for transversely pivoting the bowl on an axis spaced forwardly from its upper rear part, during movement between load carrying and load discharging position.

6. In a scraper structure, a wheeled carriage having parts adapted to serve as the front and back walls of a dirt holding compartment, and having side walls, a bowl having a bottom and side walls, said bowl being mounted to swing to loading, load carrying, and unloading positions, said bowl having notches in the lower rear parts of its side walls, pins projecting inwardly from the side walls of the carriage to cooperate with such notches, the bowl having elongated slots in its side walls curved on arcs of circles around such notches, and pins projecting from the sides of the carriage frame into said slots

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