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HEAVY DUTY SCRAPER

Original Filed Feb. 11, 1939

2 Sheets-Sheet 1

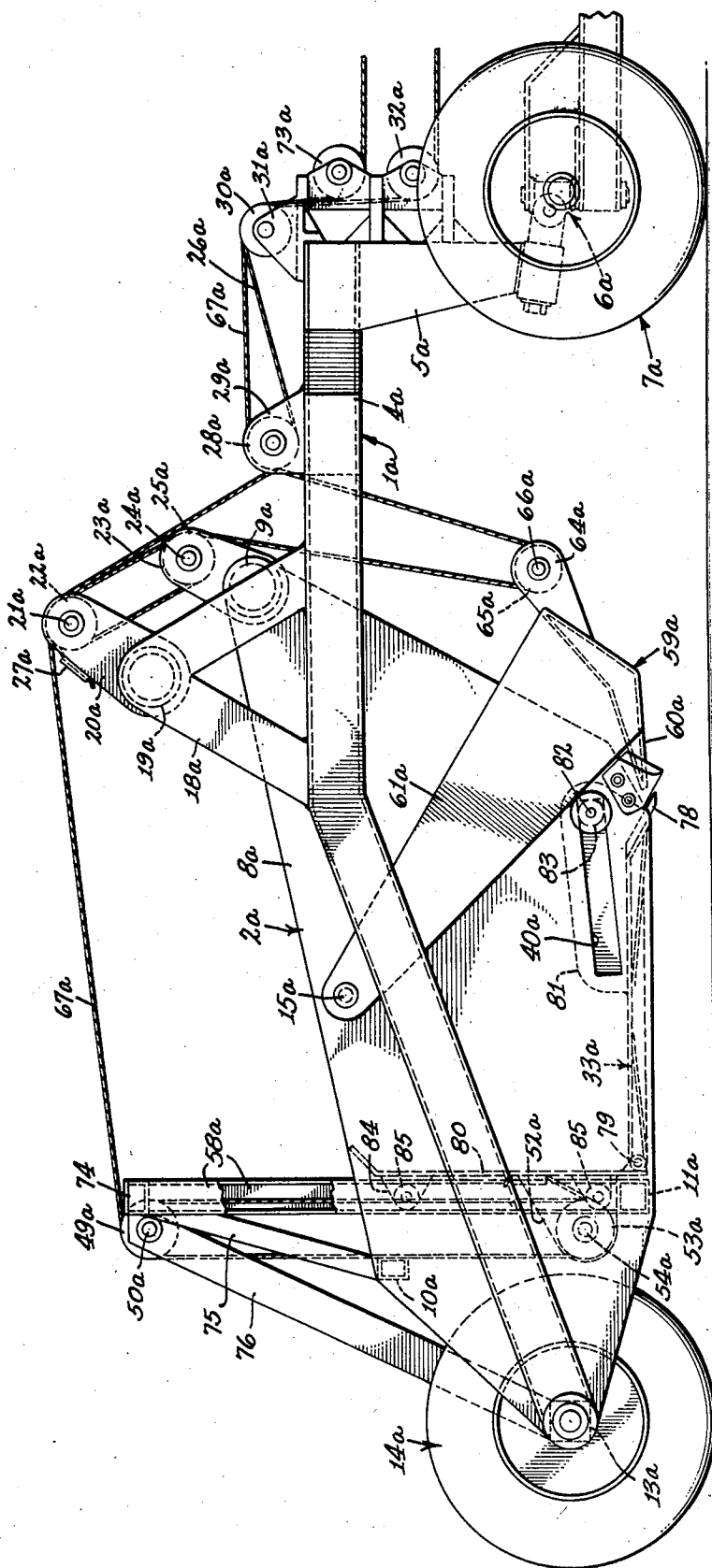


Fig. 1.

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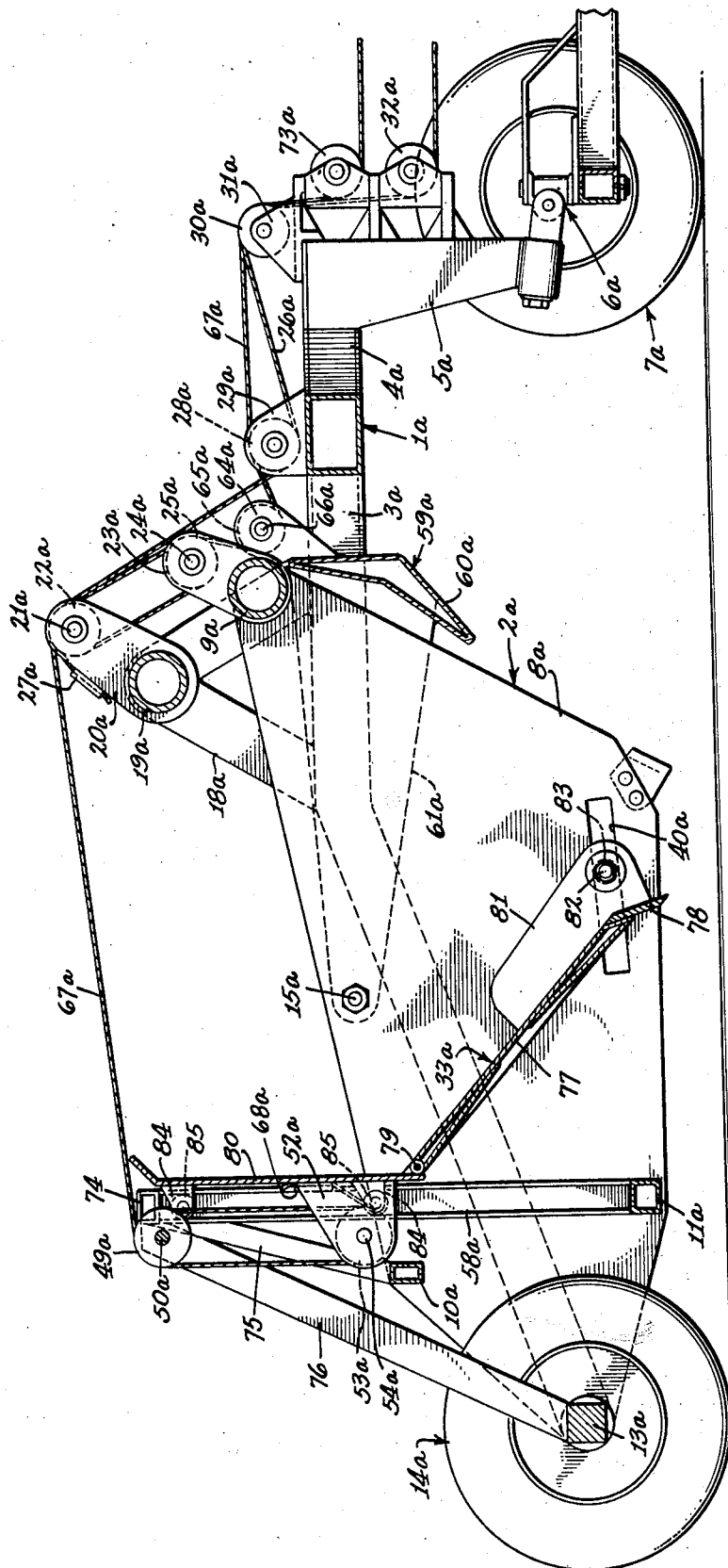


Fig. 2.

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HEAVY DUTY SCRAPER

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Original application February 11, 1939, Serial No.
255,885. Divided and this application February
16, 1940, Serial No. 319,316

6 Claims. (Cl. 37-126)

This invention relates to improvements in heavy duty earth handling, or scraper apparatus of the type shown in my application for Letters Patent filed February 11, 1939, Serial No. 255,885, and the present application being a division of said earlier application.

The main object of my invention is to provide a hauling scraper in which the bowl includes a pair of spaced apart side members which are a part of the frame structure, and a bottom and a back hinged together forming a separate unit interposed between the side members. The forward edge of the bottom member is supported on the side members by means of longitudinally movable pivots and the back is arranged for vertical movement effected by cable power means: so that for dumping the load the back of the bowl is raised vertically thereby moving the front edge of the bottom rearwardly, and consequently tilting said bottom which causes the earth to slide off.

The movable pivots are placed in a position near the forward edge of the bowl bottom which permits tilting the bottom from the carrying to the dumping position and vice versa with a minimum variation in the height of the forward edge with respect to the ground surface. This makes it possible to control the spreading of the load and leveling of the earth to a finer degree than in other types of hauling scrapers where the bowl is swung about a pivot as a unit.

In the scrapers as heretofore used, the variation of the height of the forward edge of the bowl bottom between the carrying and dumping positions is so considerable that during the spreading and leveling operations, in addition to controlling the tilting of the bowl, it must be raised or lowered as the occasion demands and since the tilting of the bowl and its raising and lowering is effected by separate controls, the operator must be an expert to manipulate both controls in proper timing simultaneously or in succession in order to obtain a fair result. With my scraper, the operator raises the bowl to the desired height for spreading the load, then controls the tilting of the bowl bottom to discharge the load as needed. Thus by having only one control to manipulate, the operator can more readily observe the operation performed and accordingly control the implement with greater flexibility and accuracy, and thereby do the work with higher degree of perfection.

I have also mounted and arranged the apron, which acts as a load retaining closure for the front end of the bowl, so that in the scraping and

loading operation said apron may be partially lowered to act as a shoe for spreading evenly and tamping down the scraped earth as it is accumulated in front of the bowl so that a uniform volume of firmly packed earth enters the bowl. This makes it possible to load a greater amount of earth into the bowl and also eliminates the wasteful traction power surges which result from uneven scraping and loading.

With these and other objects in view, the invention consists in the combination, correlation, and construction of parts, members, and features which will be described in the specification and will be finally pointed out in the claims.

Referring to the drawings:

Figure 1 is a side view of the scraper embodying my invention.

Figure 2 is a sectional elevation of the scraper in the dumping position.

The invention exemplified in the accompanying drawings includes a frame structure comprising a forward section 1a and a rear section 2a. The forward frame section 1a consists of a pair of spaced apart side arms 3a rigidly connected at the forward ends to a cross member 4a which in turn has centrally interposed between the ends thereof, a forwardly extending and downwardly depending leg 5a swivelably supported, as at 6a, on a wheeled carriage 7a which is adapted for connection to the draw bar of a tractor. The rear ends of the side arms 3a are inclined downwardly and pivotally supported at the ends on the axle 13a of a rear wheeled carriage 14a.

The rear frame section 2a is interposed between the side arms 3a and comprises a pair of spaced apart side plates 8a having a generally pentagrammatic contour. The side plates 8a are rigidly connected at the upper forwardly extending corner to a tubular cross member 9a, and at the upper and lower edges near the rear ends to cross members 10a and 11a respectively. The rear ends of the plates 8a are connected rigidly to the axle 13a of the rear wheel carriage 14a.

Side arms 3a are provided with upwardly extending brackets 18a connected at the upper ends thereof to a tubular cross member 19a which in turn has secured thereto intermediate its ends a set of five spaced apart ears 20a. The ears 20a extend upwardly and are inclined slightly toward the front and carry at the ends thereof a shaft 20a which in turn carries four sheaves 22a journaled thereon in an interposed relation between said ears 20a.

The tubular cross member 9a, between the forward ends of plates 8a, has secured thereto in-

intermediate its ends a set of four spaced apart ears 23a. The ears 23a are inclined upwardly and carry at the ends thereof a shaft 24a, which in turn, carries journaled thereon three sheaves 25a interposed between said ears 23a. The frame 1a is also provided with a pair of sheaves 28a journaled in brackets 29a on the cross member 4a and a pair of sheaves 30a journaled in brackets 31a on the leg 5a.

10 A cable 26a anchored or dead-ended as at 27a, is reaved between three of the sheaves 22a and two of the sheaves 25a and is then passed under one of the sheaves 28a and over one of the sheaves 30a, then passed through swiveled sheave 15 32a and connected to a suitable power controlled device on the tractor. By pulling and releasing the cable 26a a vertical swinging movement is imparted to the rear frame section 2a about the axle 13a of the rear wheeled carriage 14a.

20 An earth carrying bowl 33a is interposed between the side plates 8a with clearance relation thereto and comprises a bottom 77 having at the front edge thereof a scraper blade 78 and a hinge 79 at the rear edge thereof associated with 25 the bottom edge of a back 80. The side edges of the bottom 77 at the front thereof are provided with vertical webs 81 on which are mounted pins 82 having journaled thereon rollers 83 adapted to engage slots 40a in the side plates 8a. The 30 back 80 is provided at each side thereof with a pair of rearwardly extending lugs 84 which are spaced apart so that one is mounted near the bottom and the other near the top thereof. The lugs 84 carry pivotally mounted thereon rollers 35 85 which are adapted to engage vertical channels 58a. The back 80 is also provided with four spaced apart and rearwardly extending lobes 52a carrying interposed therebetween three sheaves 53a journaled on shaft 54a.

40 The vertical channels 58a are secured to inner sides of side plates 8a and their upwardly extending ends are connected to a cross member 74 and are reinforced by means of braces 75 on the cross member 10a. Additional braces 76 are 45 interposed between the cross member 74 and the axle 13a and carry at the upper ends thereof three sheaves 49a journaled on a shaft 50a.

The receiving end of the bowl 33a is provided with an apron or closure 59a. A pair of arms 50 61a are provided at the sides of the apron, which extend rearwardly along the outside of side plates 8a, with clearance relation thereto and are pivotally connected at the ends, as at 15a, to the side plates 8a. The closure 59a comprises 55 a bottom 60a in which about half of the surface is substantially horizontal when viewed in the closed position. See Figure 1. The other half is inclined upwardly toward the front forming a shoe which is used for uniformly spreading and 60 tamping down the accumulated scraped up earth in front of the bowl to facilitate uniform loading of the bowl.

The apron 59a is provided with a pair of spaced apart lugs 64a carrying a shaft 66a on which is 65 journaled a sheave 65a in an interposed relation between said lugs 64a.

A cable 67a anchored, as at 68a, on the back 80 of the bowl 33a is reaved between the sheaves 49a and 53a and passed over a sheave 22a on cross member 19a and sheave 25a on cross member 9a, then passed under sheave 65a on the apron 59a, over a sheave 28a on cross member 4a and sheave 30a on the leg 5a and then passed 75 through the swiveled sheave 73a to be connected

to the drum of a suitable power controlled device on the tractor.

The apron and bowl operate as follows:

Assuming that the implement is in the load carrying position as shown in Figure 1, and it is 5 desired to dump the load, a pulling force is exerted on cable 67a which causes the apron to raise first by virtue of the fact that it is lighter in weight than the bowl and offers less resistance to the pull. After the apron has come to rest against the cross member 9a as shown in 10 Figure 2, further pull on cable 67 raises the back 80 of the bowl 33a vertically by virtue of the guiding rollers 85 in channels 58a, causing the blade end of the bowl to recede rearwardly in a 15 substantially horizontal plane by virtue of the guiding rollers 83 and slots 40a inside plates 8a. This movement causes the bottom 77 to tilt as shown in Figure 2, thereby discharging the load.

Upon releasing cable 67a, the bowl is returned 20 to the digging position by gravity, as shown in Figure 1. After the bowl comes to a stop by virtue of the guiding rollers 85 resting on the cross member 11a further releasing of the cable lowers the apron 59a. 25

In practice for digging and scraping it is preferred to keep the apron in a lowered position so that a narrow gap is maintained between the blade 78 and the lower edge of the apron to permit a restricted amount of earth to enter the 30 bowl. The apron then acts as a shoe to spread evenly and tamp down the scraped up earth accumulated in front of the bowl, thus effecting a uniform loading and eliminating the traction power surges resultant in loading uneven amounts 35 of earth.

Having thus described my invention I claim:

1. A power scraper comprising a primary frame structure supported at the front and rear on wheeled carriages, a secondary frame structure 40 supported on the rear wheeled carriages, power means associated with said primary and secondary frames for imparting vertical movement to said secondary frame, a bowl comprising side elements which are a part of the secondary frame, 45 a back associated with said side elements for vertical movement relative thereto, a bottom hinged at the rear to said back, horizontally movable means connecting the front of said bottom to said side elements, and power means associated with said back and said secondary frame for imparting vertical movement to the back thereby causing longitudinal movement of the front edge 50 of said bottom.

2. A power scraper comprising a primary frame 55 structure supported at the front and rear on wheeled carriages, a secondary frame structure including a pair of spaced apart side plates, pivotal means for supporting said secondary frame on said rear wheeled carriage, cable power means 60 associated with the front of the secondary frame and the primary frame for imparting vertical movement to said secondary frame, a bowl comprising a back and a bottom hinged together and interposed between said side plates, said side 65 plates being side closures for the bowl, longitudinally slidable pivot means for supporting the front of said bottom on the side plates, vertically slidable means for connecting the back to said side plates, and cable power means associated 70 with the back and the secondary frame for imparting vertical movement to said back and thereby longitudinal movement to the front edge of said bottom thus tilting the bottom.

3. A power scraper comprising a front frame 75

structure having opposite side members extending rearwardly, a front running gear unit supporting the forward end of said frame structure, a rear running gear unit supporting the ends of said side members, a rear frame section having opposite side plates disposed between the side members with clearance relation thereto and supported on the rear running gear unit, a power means associated with the front and rear frame sections for imparting vertical movement to the rear frame section, a bottom having a scraper blade attached to the front edge and a back pivotally connected to the rear edge thereof, said bottom and back being disposed between said side plates with clearance relation thereto, a closure for the front end of said bowl, means for connecting the front edge of said bottom to the side plates for longitudinal movement relative thereto, means for connecting the back to said side plates for vertical movement relative thereto, and power means for imparting vertical movement to said back and thereby causing longitudinal movement of the front edge of said bottom thus tilting said bottom.

4. A power scraper comprising a front frame structure having opposite side members extending rearwardly, a front running gear unit supporting the forward end of said frame structure, a rear running gear unit supporting the ends of said side members, a rear frame section having opposite side plates disposed between said side members with clearance relation thereto and supported on the rear running gear unit, power means associated with the front and rear frame sections for imparting vertical movement to the rear frame section, a bowl comprising a bottom having hingedly attached thereto a back at the rear and having a scraper blade at the front thereof disposed between said side plates with clearance relation thereto, means connecting the front of said bottom to the side plates for longitudinal movement with respect to said side plates, means for connecting the back to the side plates for vertical movement with respect to said side

plates, and power means for imparting vertical movement to said back causing longitudinal movement of the front of said bottom and thereby tilting said bottom.

5. In a power scraper comprising a frame structure supported at both ends thereof on running gear units and arranged for vertical movement with relation to the ground surface, a scraper bowl comprising spaced apart side elements attached to said frame structure, a bottom provided with a back hingedly connected at the rear thereof and disposed between said side elements with clearance relation thereto, means connecting the front end of said bottom to the side elements for longitudinal movement relative thereto, means for connecting the back to the side elements for vertical movement relative thereto, and power means for imparting vertical movement to said back thereby causing longitudinal movement of the front edge of said bottom.

6. In a dirt moving machine, a primary frame structure supported at the front and rear on wheeled carriages, a secondary frame structure including a pair of spaced apart side plates, pivotal means for supporting the secondary frame structure on the rear carriage, cable means associated with said frame structures for raising and lowering the secondary frame structure, a scraper bowl comprising a bottom and a back hingedly associated together and disposed between said side plates with clearance relation thereto, said side plates being side closures for said bowl, a closure for the front end of said bowl, means for connecting the front end of said bowl bottom to said side plates for longitudinal movement, means connecting the back of said bowl to said side plates for vertical movement, and cable means associated with said bowl closure, said secondary frame and said bowl for actuating said bowl closure and for imparting vertical movement to the back of said bowl thereby causing longitudinal movement of the front edge of the bowl bottom thus tilting said bottom.

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