Jan. 28, 1947. G. E. DANIELS 2,414,933

DIRT SCRAPER

Filed June 2, 1944 3 Sheets-Sheet 1

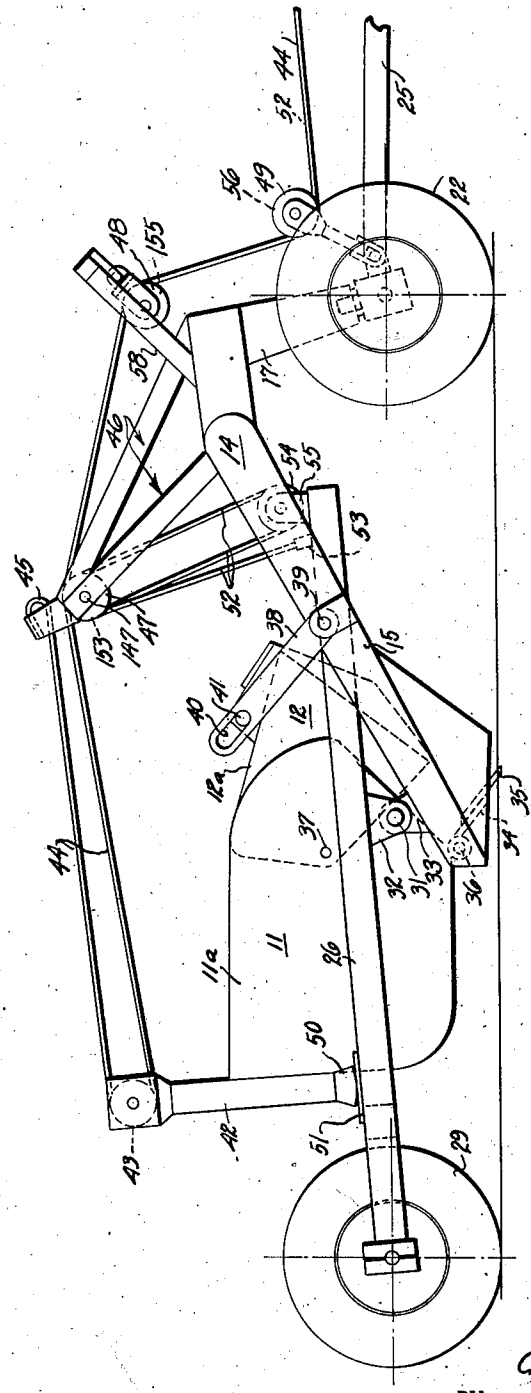


Fig. 1

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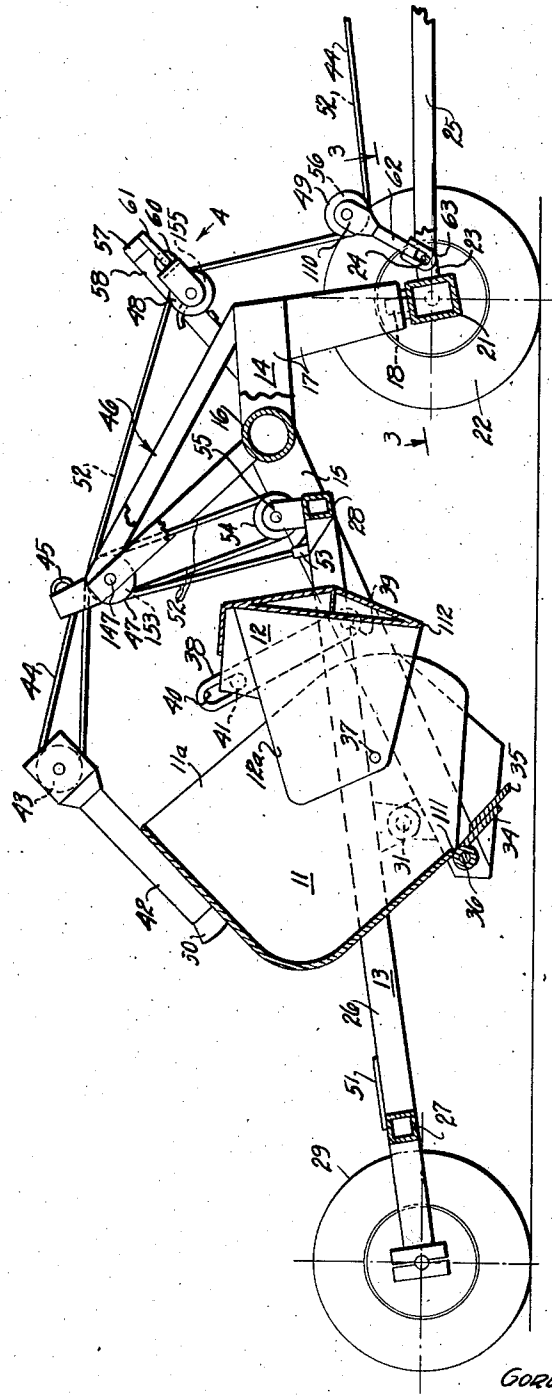


Fig. 2.

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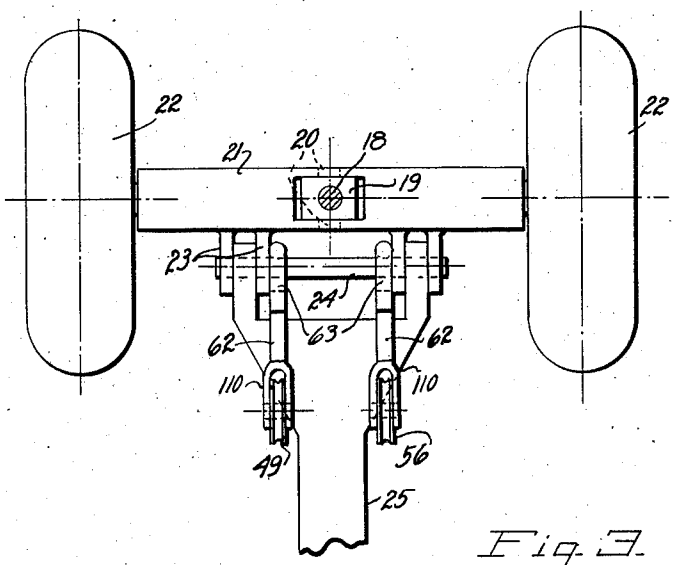


Fig. 3.

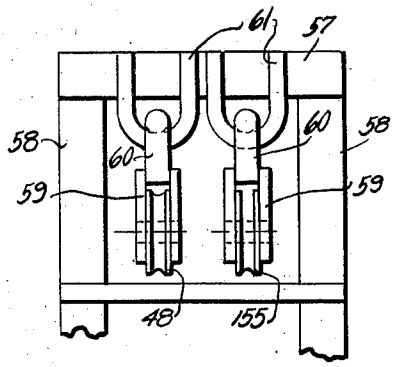


Fig. 4.

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2,414,933

DIRT SCRAPER

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Application June 2, 1944, Serial No. 538,486

6 Claims. (Cl. 37—126)

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This invention relates to dirt scrapers and particularly to scrapers of the carry-all type in which a scraper body having a scraping edge associated therewith is pulled along the ground to accumulate dirt scraped by the edge within the body.

One object of the present invention is to simplify the controls necessary to manipulate a scraper of the above type.

Another object is to provide common means for operating both the front and rear bowls or receptacles of a scraper of the above type in proper coordination.

Another object is to reduce wear on the cable and sheaves of a cable system for a dirt scraper or the like.

Another object is to provide a simple and compact dirt scraper which is easy and economical to manufacture.

The manner in which the above and other objects of the invention are accomplished will be readily understood on reference to the following specification when read in conjunction with the accompanying drawings wherein:

Fig. 1 is a side elevational view of a dirt scraper embodying the present invention, illustrating the same in digging position.

Fig. 2 is a sectional elevational view of the scraper, illustrating the same in discharging position.

Fig. 3 is a sectional plan view taken substantially along the lines 3—3 of Fig. 2.

Fig. 4 is a front view of the upper sheave assembly and is taken in the direction of the arrow 4 of Fig. 2.

The scraper comprises a rear bowl or receptacle 11 and a forward apron, bowl or receptacle 12 mounted on a frame including a rear section 13 and a forward section 14. The bowl 11 and apron 12 have overlapping sides 11*a* and 12*a*, respectively, to laterally retain scraped material accumulated therein. The forward frame section includes a pair of rearwardly extended arms 15 integrally connected through a tubular cross member 16 to a post 17 having a socket at the lower end thereof in which is fitted a bearing pin 18 extending from a bearing block 19 (Fig. 3). The latter is located in a well formed in a front axle 21 and has trunnion pins 20 mounted in bearings formed in the axle 21 to permit front wheels 22 which are attached to the axle in any suitable manner to follow any uneven ground surface. Brackets 23 extending from the axle 21 support a pivot rod 24 on which are pivoted the ends of a bifurcated draft bar 25. The draft

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bar is adapted to be attached to a tractor or other suitable prime mover.

The rear frame section 13 comprises spaced longitudinally extending beams 26 fixed to cross beams 27 and 28 (Fig. 2). These beams are secured at their rear ends to the axles of rear wheels 29. Pivot pins 31 pivotally connect brackets 32 and 33 formed integrally with beams 26 and arms 15, respectively, thereby pivotally connecting the front and rear sections of the scraper frame whereby the scraper may be raised and lowered in the manner to be described hereinafter.

Secured between the rearwardly extending arms 15 of the front frame section is a mold board 34 on which is securely mounted in any suitable manner a scraping blade 35 adapted to be inserted in the ground as shown in Fig. 1 to scrape the ground and guide such scraped material upwardly into the body of the scraper as formed by the receptacles 11 and 12. A pivot rod 36 is fastened between the arms 15 directly adjacent the mold board 34 and forms a pivotal support for the rear receptacle 11, enabling the same to be moved between its positions illustrated in Figs. 1 and 2.

Pivot pins 37 attached to the sides of the receptacle 11 pivotally support the front apron 12 at its sides and adjacent its rear end. The forward end of the front apron 12 is supported from the front frame section 14 by a pair of links 38 pivoted at 39 to the arms 15 and provided with elongated slots 40 at the upper ends thereof which embrace pins 41 extending from the sides 12*a* of the apron 12.

Means are provided for moving the receptacle 11 and apron 12 from their digging positions shown in Fig. 1 to their discharging positions shown in Fig. 2. Attached to the rear receptacle 11 are posts 42 terminating in a support for a sheave 43 around which is wrapped a cable 44 suitably anchored at 45 to a truss 46 extending upwardly from the front frame section 14. The cable 44 passes over a sheave 47, rotatably mounted on a shaft 147 carried at the upper end of truss 46, and thence passes over a second sheave 48 and under a third sheave 49. The free end of the cable is suitably connected to a winch mounted on and driven by said tractor. Since such tractor operated winches are well known in the art it is deemed not necessary to illustrate the same.

As the cable 44 is drawn forward by the tractor winch the receptacle 11 rocks about the pivot rod 36, forcing the pivot pins 37 to move the front apron 12 forwardly. The latter rises somewhat

into the position shown in Fig. 2 by virtue of the rocking of links 38 so that both bowl 11 and apron 12 assume a discharging position in which their adjacent edges 111 and 112, respectively, are separated and the planes of their floors or bottom surfaces assume angular positions favorable to the discharge of scraped material contained therein. Upon releasing the cable 44 the receptacle and apron move toward their loading position shown in Fig. 1 by virtue of their weight until lugs 50 adjacent the lower end of the posts 42 strike bottoming plates 51 suitably fastened to the beams 26 thereby limiting counterclockwise rocking of the receptacle 11.

Means are provided for raising and lowering the frame whereby to move the scraper blade 35 into different positions relative to the ground and also to locate the receptacle 11 and apron 12 in digging and transporting positions. A second cable 52 is anchored at 53 to the front cross-beam 28 of the rear frame section 13 and passes around two sets of sheaves 153 and 54, the former being rotatably mounted on shaft 147 while the latter set of sheaves is mounted on brackets 55 fastened to the cross-beam 28. The cable 52 then passes over a sheave 155, coaxial with sheave 48, and under a sheave 56 substantially coaxially with sheave 49. The free end of the cable 52 is attached to a second winch carried by the tractor.

As the cable 52 is drawn forwardly, the rear frame section 13 is rocked counterclockwise about the pivot pins 31 relative to the front frame section, thus raising the receptacle 11, apron 12 and scraper blade 35 from the position shown in Fig. 1. It will be noted that this action will cause the pivot rod 36 to rise a greater amount than the lugs 50 which are guided by the beams 26, thereby (due to rocking of arms 15 about pivots 31) causing rearward movement of receptacle 11 along beams 26 causing receptacle 12 to rock links 38 counterclockwise. This causes a relative clockwise rocking of the receptacle 12 about pivot 37 bringing the edge 112 (Fig. 2) toward the edge 111 of receptacle 11 so as to close the opening between the receptacle and the apron.

When it is desired to move the scraper into a digging or loading position, the cable 52 is released allowing the weight of the frame sections 13 and 14 to move the scraping blade 35 into the ground so that subsequent forward movement of the scraper will accumulate scraped material into the receptacle 11 and apron 12.

The slots 41 in links 38 permit the apron 12 to freely rise or ride over any large boulders or mounds of earth as the scraper is pulled forwardly during a digging operation.

Referring in particular to Figs. 2 and 4 the sheaves 48 and 155 are suspended for universal movement from a cross-piece 57 mounted on posts 58 attached to the front post 17. For this purpose the sheave block 59 of each sheave is fixed to a U-shaped bar 60 interlocked with a second U-shaped bar 61 secured as by welding to the cross-piece 57. This construction enables each sheave and its block to automatically align itself into any position universally (within certain limits) according to the components of any reactive forces occurring in the cable system.

The lower sheaves 49 and 56 (see also Fig. 3) are similarly mounted for universal movement. In this case, the sheave block 110 for each sheave is integrally mounted on a rod 62 terminating in a U-shaped bar 63 embracing the pivot bar 24 for the draft bar 25. The universal connection thus formed enables the sheaves 49 and 56 to align themselves in such a position so as to minimize any side thrust by the cables which might otherwise develop, particularly when the scraper is to be turned.

It will be seen from the above that the combined universal supports for the two sets of sheaves 48—155 and 49—56 provides a simple sheave construction which eliminates any side thrust or other undesirable conditions in the cable system.

In lieu of the type of universal suspension illustrated in the present drawings, a flexible cable device as illustrated at 39 (Fig. 2) in my copending application Serial No. 520,167, filed January 29, 1944, may be used. For example the rod 62 may be substituted by a cable or other similar flexible element of similar length.

The present invention forms a continuation-in-part of said application Serial No. 520,167.

Having thus described the invention what I claim as new and desire to secure by Letters Patent is:

1. A dirt scraper comprising a frame, a rear receptacle pivotally supported by said frame, a front receptacle pivotally connected to said rear receptacle, a link pivotally connected adjacent the lower end thereof to said frame and adjacent the upper end thereof to said front receptacle for supporting the latter, and means for rocking said rear receptacle whereby to rock both said receptacles.

2. A dirt scraper comprising a frame, a rear receptacle pivotally supported by said frame, a front receptacle pivotally connected to said rear receptacle, a link pivotally connected adjacent one end thereof to said frame and pivotally connected adjacent the other end thereof to said front receptacle for supporting said front receptacle, one of said last two mentioned pivotal connections comprising a pin and slot connection for permitting limited relative movement between said front receptacle and said frame along a line passing through said two last mentioned pivotal connections, and means for rocking one of said receptacles whereby to rock both said receptacles.

3. A dirt scraper comprising a frame, a scraper blade carried by said frame, a rear receptacle pivotally supported by said frame for movement about an axis adjacent said blade, a front receptacle pivotally connected to said rear receptacle adjacent the rear end of said front receptacle, a link pivotally connected between said frame and said front receptacle adjacent the front thereof for supporting said front receptacle and means for rocking said rear receptacle whereby to rock both said receptacles.

4. A dirt scraper comprising a first frame, a second frame pivotally connected thereto, a first receptacle, means on said first frame pivotally supporting said first receptacle adjacent one end thereof, means on said second frame pivotally supporting said first receptacle adjacent the opposite end thereof, a second receptacle pivotally connected at one end thereof to said first receptacle adjacent said opposite end of said first receptacle, means on said second frame pivotally supporting said second receptacle adjacent the opposite end thereof, and means for rocking one of said frames relative to the other.

5. A dirt scraper comprising a rear wheel supported frame, a front wheel supported frame pivotally connected to said rear frame and including a portion extending rearwardly of said pivotal connection; a rear receptacle pivotally supported by said front frame at said extending portion

thereof, a front receptacle pivotally connected to said rear receptacle, a link pivotally connected adjacent the lower end thereof to said front frame and adjacent the upper end thereof to said front receptacle for supporting the latter, means for rocking said rear receptacle whereby to rock both said receptacles, and means for raising the pivotally connected portions of said frames whereby to raise said receptacles.

6. A dirt scraper comprising a rear wheel supported frame, a front wheel supported frame pivotally connected to said rear frame and including a portion extending rearwardly of said pivotal connection; a rear receptacle pivotally supported by said front frame at said extending portion thereof, a front receptacle pivotally connected to said rear receptacle, a link pivotally connected adjacent the lower end thereof to said front frame and adjacent the upper end thereof to said front receptacle for supporting the latter, said last mentioned pivotal connection being located in front of said first mentioned pivotal connection for said rear receptacle, means for rocking said rear receptacle whereby to rock both said receptacles, and means for raising the pivotally connected portions of said frames whereby to raise said receptacles and to cause said front receptacle to rock toward said rear receptacle.

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