

May 18, 1965

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3,183,609

EARTH WORKING SCRAPER HAVING POWER MEANS DISPOSED
BETWEEN FRONT AND REAR LOAD CARRYING BOWLS

Original Filed Sept. 25, 1961

3 Sheets-Sheet 1

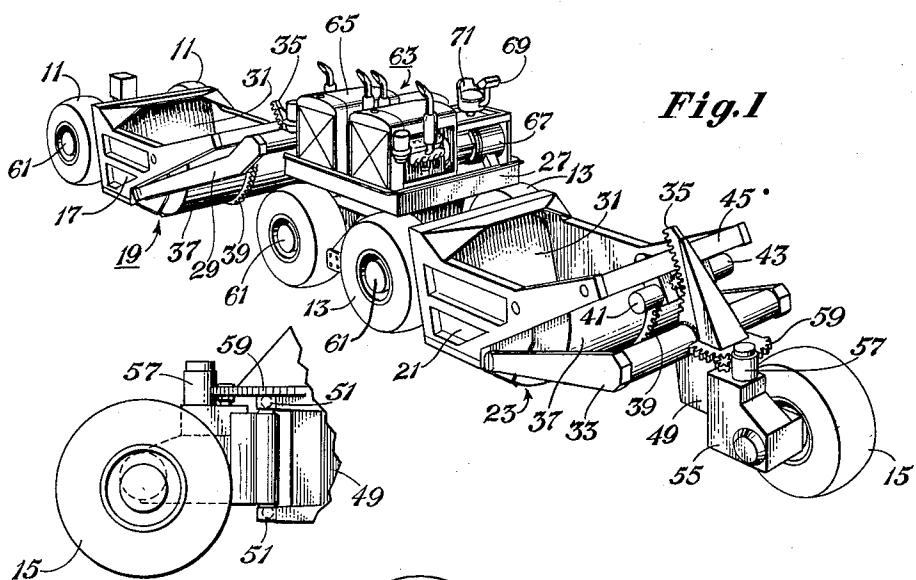


Fig. 1

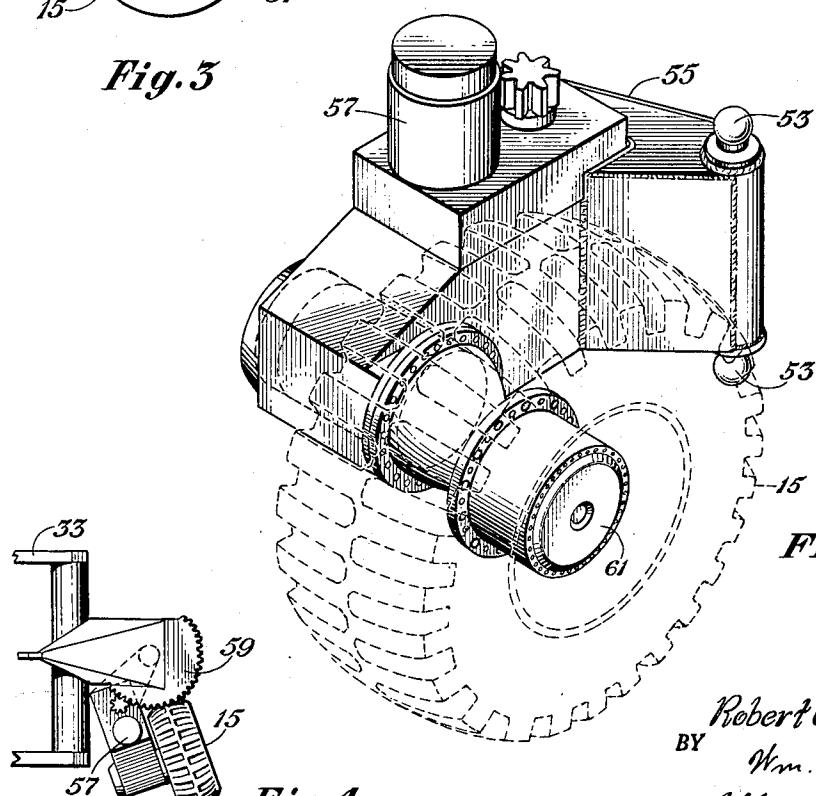


Fig. 2

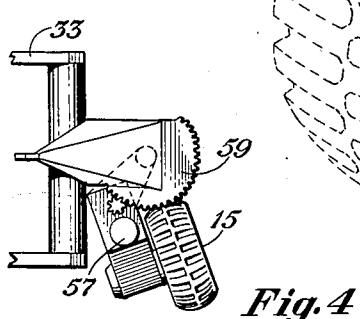


Fig. 4

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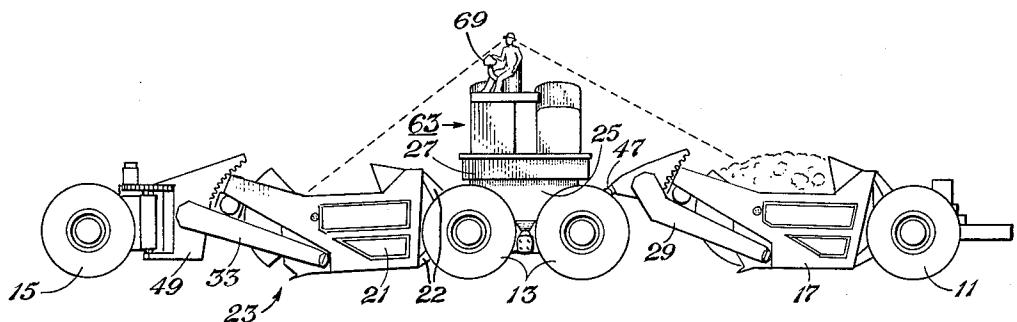


Fig. 5

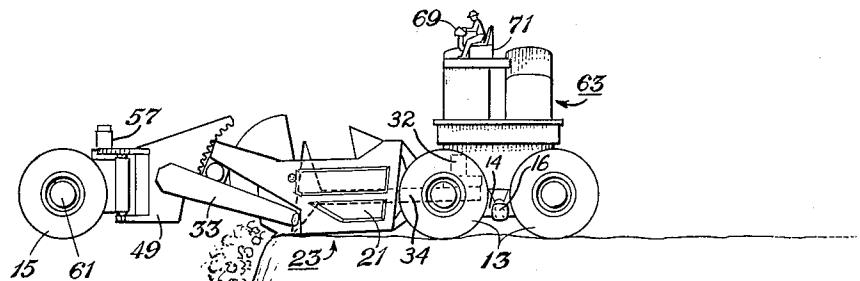


Fig. 6

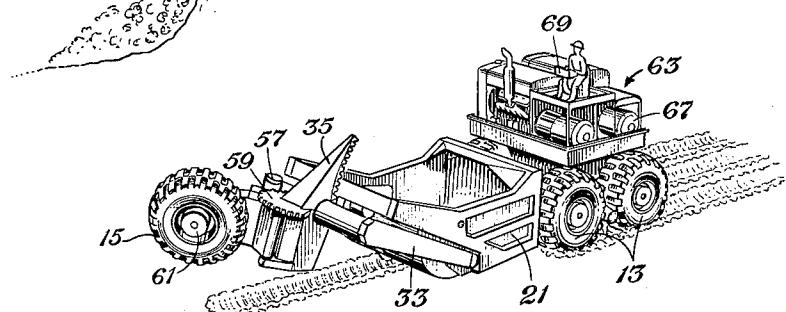


Fig. 7

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3 Sheets-Sheet 3

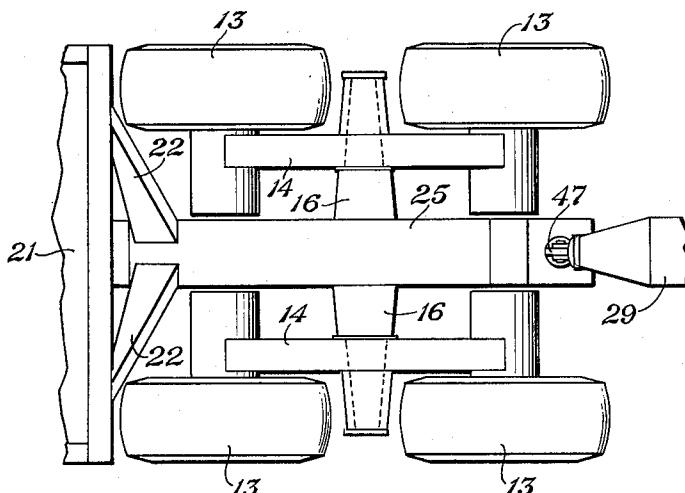


Fig. 8

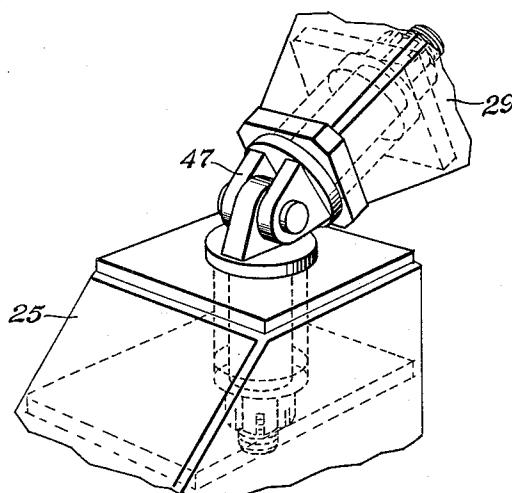


Fig. 9

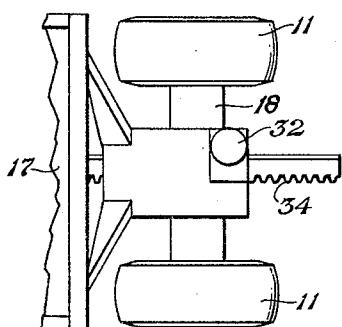


Fig. 10

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EARTH WORKING SCRAPER HAVING POWER MEANS DISPOSED BETWEEN FRONT AND REAR LOAD CARRYING BOWLS

Robert G. LeTourneau, P.O. Box 2307, Longview, Tex.
Continuation of application Ser. No. 140,555, Sept. 25,
1961. This application Mar. 6, 1964, Ser. No.
351,273

2 Claims. (Cl. 37—127)

My invention relates to earth working machinery, and more particularly to self-propelled, self-loading, and self-unloading earth moving machines. Such machines are commonly known to the trade as earth working scrapers. This application is a continuation of my application Serial No. 140,555, filed September 25, 1961, and now abandoned.

The general object of my invention is to provide earth working scrapers which incorporate certain advantageous features and improvements not found in prior art machines. One such feature is the ability to unload over a soft area or a bank or other steep depression. Another such feature is the ability to work out of a deep rut or boggy spot without outside help. Another feature is an improved steering arrangement. A further feature is an improved machine organization and operator station arrangement.

Further objects and advantages of my invention will be apparent from the following description of a preferred embodiment, taken together with the accompanying drawings in which:

FIG. 1 is a schematic perspective view showing an earth working machine in accordance with a preferred embodiment of my invention;

FIG. 2 is a schematic perspective view, partially in phantom, showing the front wheel mounting and steering mechanism;

FIG. 3 is a fragmentary side elevational view of the front wheel portion of the machine of FIG. 1;

FIG. 4 is a fragmentary plan view of the front end of the machine of FIG. 1;

FIG. 5 is a side elevational view of the machine of FIG. 1, illustrating the operator's advantageous view of the machine;

FIG. 6 is a side elevational view of the machine of FIG. 1 with the rear load carrying unit removed, and illustrating the unloading over a bank;

FIG. 7 is a schematic perspective view of the machine of FIG. 6, illustrating the way the machine is able to work itself out of ruts;

FIG. 8 is a schematic plan view showing the intermediate axle and walking beam arrangement for the machine of FIG. 1;

FIG. 9 is a schematic perspective view showing the device for coupling the rear scraper unit to the intermediate axle; and

FIG. 10 is a schematic plan view showing the axle arrangement for the rear scraper unit.

Referring now to the drawings, there is shown a self-propelled, self-loading, and self-unloading earth working machine in accordance with a preferred embodiment of my invention. This machine as shown by FIGS. 1 and 5 is a three axle, seven wheel machine with tandem load carrying units, while in FIGS. 6 and 7, the machine is shown as a two axle, five wheel machine with a single load carrying unit. The five wheel machine as shown is identical with the seven wheel machine, except that the second load carrying unit has been removed. The details shown by FIGS. 2, 3 and 4 apply to both the seven wheel and the five wheel arrangement.

The machine of FIGS. 1 and 5 has a pair of rear wheels

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11, four intermediate wheels 13, and a single front wheel 15. The rear wheels 11 are mounted to a fixed axle 18 which supports the bowl 17 of the rear unit 19. The intermediate wheels 13 are arranged in tandem pairs, 5 with each pair mounted on a walking beam 14 which in turn is pivoted to an intermediate axle 16. The intermediate axle supports the bowl 21 of the front unit 23 and a frame structure 25 which in turn supports a platform 27, and the yoke 29 of the rear unit 19. The front unit bowl 21 is supported on the intermediate axle 16 by means of a frame structure 22 which is fixed to and extends rearwardly from the rear of the front bowl 21 and terminates on the intermediate axle 16. Both front and rear scraper units 23, 19 are provided with the usual working parts, including a power controlled tail gate 31, a yoke 29, 33 pivoted to the respective bowl, bowl elevation control mechanism 35, apron 37, and apron control mechanism 39. In the embodiment shown, each tail gate 31 is powered by an electric motor driven gear reduction 32 driving a rack 34 which is fixed to and extends rearwardly of the tail gate. Also, in the embodiment shown, each apron 37 is controlled by an electric motor driven gear reduction 41 fixed to the yoke structure and driving a sector gear on the apron front. Also, in the embodiment shown, the bowl elevation is controlled in each case by an electric motor driven gear reduction 43 fixed to the bowl cross-bar 45 and driving on a sector gear fixed to the yoke structure 29, 33.

The yoke 29 of the rear unit is supported on the intermediate axle frame 25, being removably fixed thereto by a coupling device 47 which allows universal pivoting motion. The yoke 33 of the front unit 23 is fixed to a frame 49 provided with a pair of vertically aligned ball sockets 51 adapted for receiving vertically aligned balls 53 mounted on a front steering frame 55. The front steering frame 55 provides a fixed axle for the single front wheel 15 and also mounts an electric motor driven gear reduction 57 having an output pinion engaging a sector gear 59 which is fixed to the yoke frame 49. Each of the 20 wheels 11, 13, 15 of both the front and rear units 23, 19 is powered by the respective electric motor driven gear reduction 61. Also, each machine control function such as tail gate, bowl elevation, apron, and steering is powered by an electric motor driven gear reduction. Electric power is supplied by a power plant 63 including one or more internal combustion engines 65 driving an electric generator or generators 67. The power plant 63 is mounted on the platform 27 above the intermediate wheels 13. All machine functions are electrically controlled from an operator's station, which is also mounted on the platform. The operator's station includes the control panel 69 and seat 71, which are both rotatable through a full 360° to enable the operator to look in any direction without disturbing his position relative to the 25 control panel.

One of the features of the earth working machine as shown by FIGS. 1 and 5 resides in the arrangement of the operator's station; it being located on the platform between the front and rear load carrying units. This 30 location affords the operator a commanding view of the entire machine, and particularly allows him a clear view of the bowls, aprons, and tail gates of both units, for effective loading and unloading operations. Since the operator's seat and control panel can be rotated through 35 360°, the operator can easily always face in the most convenient direction. Also, since the machine has three axles, steering is identical in both directions of machine travel. Thus, the machine can travel as well in one direction as the other, and without any confusion of the 40 operator on steering.

As hereinbefore mentioned, the machine as shown by

FIGS. 6 and 7 is the same as that of FIGS. 1 and 5 except that the rear load carrying unit has been removed. As thus constituted, the machine has a four wheel bogie supporting most of the load, and a single wheel out front for steering. This machine is capable of dumping either on soft fill or over a bank, as illustrated by FIG. 6. This is so because the four wheel bogie can stay on firm ground and push the bowl front to the edge of the bank, unload, and then pull back. The rear end of the machine is sufficiently heavy and stable so that the front wheel and yoke assembly can be suspended in midair when necessary. It should be noticed that the front wheel will be located far enough forward so as to support no more than a one wheel share of the total load. Also, since the single front wheel is a considerable distance from the four wheel bogie, it will have sufficient leverage to steer the machine easily in spite of its relatively light load.

Another feature of the earth working machine as shown by FIGS. 6 and 7 is its unique ability to work itself out of deep ruts or bog without outside aid. This operation is partially illustrated by FIG. 7, which shows that the bowl has been lowered to the ground, and the front wheel has been raised clear of the ground and swung to the right by the steering mechanism. Next, the front wheel is lowered to the ground, the bowl is raised off the ground, and the bowl is then swung to the right by action of the steering mechanism. This action can be repeated to rotate the entire machine as far to the right as necessary, forcing the four wheel bogie out of the ruts and onto firmer footing. The same operation could of course be performed to rotate the machine to the left. In actual practice, such maneuvers have proved effective in most cases to extricate the machine without any assistance from other machines.

It should be pointed out that the tandem load carrying unit arrangement as shown by FIGS. 1 and 5 can also be used to dump on soft fill or over a soft bank if desired. Such machine can also work itself out of ruts or bog in the same manner as above described.

It should also be apparent that a five wheel three axle machine or a three wheel two axle machine could also be utilized in the same general manner as the ones herein shown and described, even though in some cases they would not be as effective.

The foregoing disclosure and the showings made in the drawings are merely illustrative of the principles of this invention, and are not to be interpreted in a limiting sense.

I claim:

1. A self-propelled, self-loading and self-unloading earth working machine comprising a front axle, an intermediate axle, and a rear axle, a single electric motor driven wheel mounted on said front axle, powered means for steering said front axle, four electric motor driven wheels in tandem pairs on walking beams supported by said intermediate axle, two electric motor driven wheels mounted on said rear axle, a first load carrying scraper bowl unit between and supported by said front axle and said intermediate axle, a second load carrying scraper bowl unit between and supported by said intermediate axle and said rear axle, and a power plant for generating electric power supported on said intermediate axle.

2. A self-propelled, self-loading, and self-unloading earth working machine comprising a front axle and a rear axle, a single electric motor driven wheel mounted on said front axle, a plurality of electric motor driven wheels mounted on said rear axle, a power plant for generating the electric power for said wheels supported on said rear axle, a load carrying scraper bowl unit supported at its rear end on said rear axle, a yoke structure supported at its front end on said front axle and pivoted at its rear end about a horizontal axis to the front end of said bowl, power means for controlling the pivoting action of said bowl on said yoke, and a powered articular joint between the forward end of said yoke and said front axle with said joint having a vertical pivot axis disposed rearwardly of said front wheel, said front axle being located a sufficient distance from said rear axle that said single wheel does not exceed its proportionate share of the total load.

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BENJAMIN HERSH, Primary Examiner.