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2,885,103

POWER LOADERS AND LOADING BUCKETS THEREFOR

Original Filed Jan. 4, 1957

2 Sheets-Sheet 1

Fig. 1

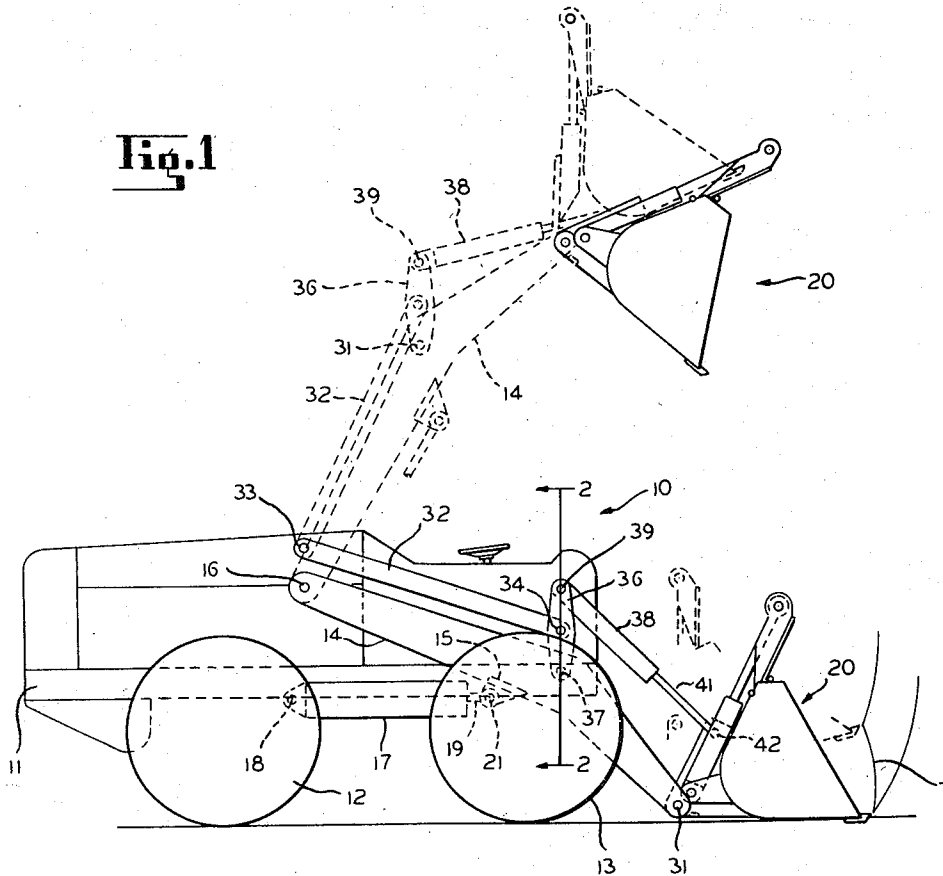
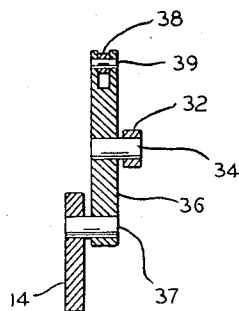


Fig. 2



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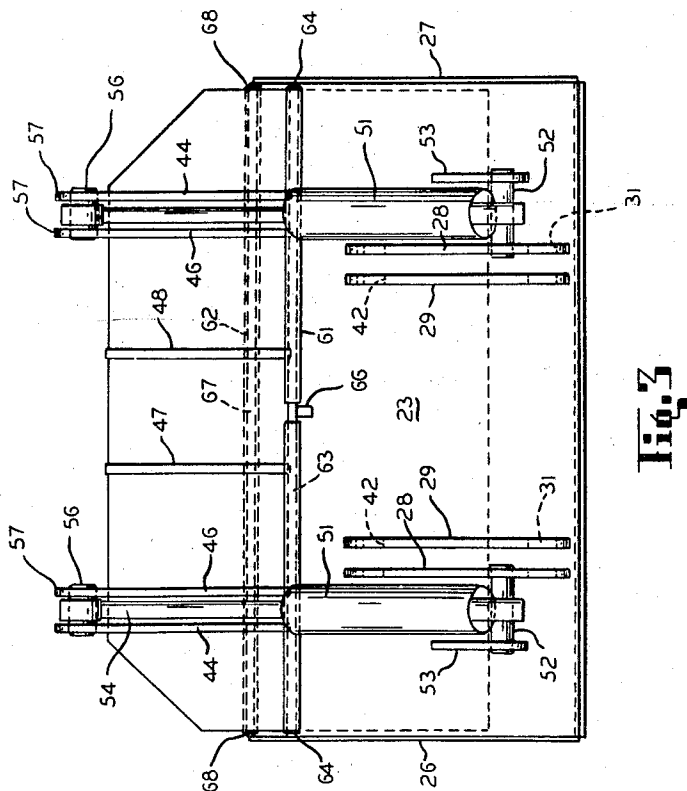
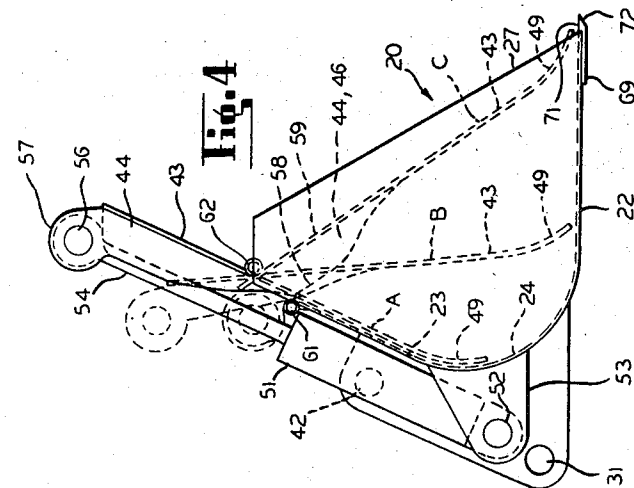
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POWER LOADERS AND LOADING BUCKETS THEREFOR

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Application November 21, 1957, Serial No. 697,815

8 Claims. (Cl. 214—510)

This invention relates generally to improvements in power loaders and particularly to improvements in buckets therefor whereby the contents thereof may readily be facilitated.

This application is a division of my copending application Serial No. 632,459, filed January 4, 1957.

An object of this invention is to provide an improved construction for a loader bucket whereby the load may be readily ejected therefrom, the structure for effecting the ejection enabling the use of a bucket of conventional configuration and not having a bottom formed on a circular arc, thereby making it possible greatly to increase the capacity thereof.

Other objects and important features of the invention will be apparent from a study of the specification following taken with the drawings which together describe and illustrate a preferred embodiment of the invention and what is now considered to be the best mode of practicing the principles thereof. Other embodiments may be suggested to those having the benefit of the teachings herein, and such other embodiments are intended to be reserved especially as they fall within the scope and spirit of the subjoined claims.

In the drawings:

Fig. 1 is a side view of a power loader having the improvements according to the present invention embodied therein;

Fig. 2 is a sectional view to an enlarged scale taken along the line 2—2 looking in the direction of the arrows, showing details of a yoke connection between the boom and link of such loader;

Fig. 3 is a back elevational view to an enlarged scale of the bucket of the loader seen in Fig. 1, showing details of the construction thereof; and

Fig. 4 is an end view thereof.

Referring now particularly to Fig. 1 of the drawings, the invention is embodied in a power loader indicated generally by the reference numeral 10. Said loader includes a frame 11 mounted for movement upon tractive wheels 12 and 13. The precise details of the prime mover for the loader 10, and the tractive mechanism therefor forms no part of the present invention and accordingly is not described in further detail.

The loader 10 includes a pair of laterally spaced booms 14 which are pivotally connected at 16 to the frame 11. A power cylinder 17 for raising and lowering each boom 14 is pivotally connected at 18 to each side of the frame 11, and has a piston 19 therein pivotally connected at 21 to a bracket 15 at the underside of the boom 14. As seen in Fig. 1, the boom 14 extends forward of the loader 10 and downward to the ground surface when the piston rod 19 is retracted within the cylinder 17.

A loader bucket indicated generally by the reference numeral 20 has a bottom 22 and a back wall 23 which are joined together by a curved portion 24. Laterally spaced end walls 26 and 27 are welded to the back wall 23, the curved portion 24 and the bottom 22. Spaced pairs of gusset plates 28 and 29 extend from the outside

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of the back wall 23 and the curved portion 24, and provide a pivotal connection at 31 thereon for the forward end of the boom 16.

A link 32 extending in parallel relationship to the boom 14 is pivotally connected at 33 to the frame 11 at a point above the pivotal connection 16 for the boom 14. The other end of link 32 is pivotally connected at 34 substantially midway of a yoke 36, see also Fig. 2, in turn pivotally connected at 37 to the boom 14.

Power means including a cylinder 38 pivotally connected at its upper end 39 to the upper end of the yoke 36 has a piston rod 41 movable therein pivotally connected at 42 to the spaced gusset plates 28 and 29 at a point spaced from the pivotal connection 31 for the boom 14 thereto. As seen in Fig. 2, the boom 14 and the link 32 are disposed in different planes, so that the boom 14 and the link 32 can clear each other as seen in the dotted line position of the loader 10 shown in connection with Fig. 1.

It will be seen that the action of the cylinder 17 is to lift the boom 14 together with the bucket 20, while the cylinder 38 and its piston rod 41 move the bucket 20 relative to the boom 14 for loading and unloading of the bucket.

Means are provided for ejecting the load from the bucket 20, and to this end the bucket 20 is provided with an ejector blade 43 spanning substantially the distance between the spaced end walls 26 and 27. The ejector blade 43 is stiffened by spaced pairs of ribs 44 and 46 on the back side thereof and by additional stiffener ribs 47 and 48 disposed between the spaced pairs of stiffener ribs 44 and 46. The ejector blade 43 has a contour 49 at the bottom thereof corresponding to the contour of the curved portion 24, and the ejector blade 43 is moved from the position A in close proximity to the rear wall 23 through a position B to a position C where the contents of the bucket 20 are discharged.

Means are provided for moving the ejector blade 43 through the several positions between the position A and the discharge position C, and to this end there is provided a cylinder 51 pivotally connected to a pin 52 having one end thereof mounted in the gusset plate 28 and its other end in a bracket 53 extending from the rear of the curved portion 24 as seen in Fig. 4. The cylinder 51 has a piston rod 54 movable therein which is pivotally connected by a pin 56 at an eye 57 formed in the top of the spaced stiffening ribs 44 and 46, see also Fig. 3.

Each of the stiffener ribs 44, 46, 47 and 48 has a cam profile 58 as seen in Fig. 4 which together with the front surface 59 of the ejector blade 49 cooperate respectively with spaced rollers 61 and 62 as the blade 43 moved between positions A and C. Roller 61 is arranged to turn on a dead shaft 63 welded at its ends 64 to the spaced end walls 26 and 27 and behind the rear wall 23. The center of the shaft 63 is also welded to a lug 66 in turn welded behind the rear wall 23. The other roller 62 is mounted freely upon a dead shaft 67 which is welded at its ends 68 to the respective end walls 26 and 27, and at the top thereof as seen in Fig. 4.

The two rollers 61 and 62 operate to constrain the movement of the ejector blade 43 so that the lower end of the ejector blade will follow the curved portion 24 and the bottom 22 of the bucket 20 in moving from position A seen in Fig. 4 through position B to position C. During such movement the piston rod 54 telescopes within the cylinder 51, and vice versa, the stiffening ribs 44, 46, 47 and 48 having their surfaces 58 and 59 in engagement with the rollers 61 and 62 during such movement.

In position C of the ejector blade 43 the bucket 20 can effectively operate as a dozer attachment for the power loader 10.

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The bottom 22 of the bucket 20 is provided with a forward cutting edge 69 which has an upper surface 71 substantially in the plane of the bottom 22, with a bevel surface 72 as seen in Fig. 4. The configuration of the cutting edge 69 is effective at all times during the crowding movement of the loader 10 in a generally horizontal direction so that there will be a component or thrust to provide a small amount of lifting thrust against the bucket 20, at least effective to prevent any tendency of the bucket to dig in a direction from the horizontal line of thrust. The thrust against the surface 72 of the cutting edge 69 also reduces the frictional drag of the bottom 22.

While the invention has been described in terms of a preferred embodiment thereof its scope is intended to be limited only by the claims here appended.

I claim as my invention:

1. In a power loader, a frame, a boom pivotally mounted to said frame, a link pivotally mounted to said frame, a bucket pivotally connected to said boom adjacent the end thereof remote from its pivotal connection to said frame, said bucket having a bottom and a back wall with a curved portion connecting said bottom and back wall, and a pair of end walls, power means interposed between said link and said bucket for pivoting said bucket relative to said boom, an ejector blade spanning substantially the distance between said end walls for discharging the contents of said bucket, and means for moving said ejector blade from a position adjacent said back wall to a position where the contents of said bucket are discharged while following the contours of said curved portion and said bottom comprising a pair of camming surfaces on said ejector blade, a pair of rollers on said bucket having said camming surfaces therebetween for constraining the movement of said ejector blade to a prescribed path, and a fluid operator mounted on said back wall of said bucket for moving said ejector blade consisting of a cylinder and piston movable to positions relative to each other in accordance with the position of said ejector blade.

2. In a power loader, a frame, a boom pivotally mounted to said frame, a link pivotally mounted to said frame, a bucket pivotally connected to said boom adjacent the end thereof remote from its pivotal connection to said frame, said bucket having a bottom and a back wall with a curved portion connecting said bottom and back wall, a pair of end walls, power means interposed between said link and said bucket for pivoting said bucket relative to said boom, an ejector blade spanning substantially the distance between said end walls for discharging the contents of said bucket, and means for moving said ejector blade from a position adjacent said back wall to a position where the contents of said bucket are discharged while following the contours of said curved portion and said bottom comprising a pair of camming surfaces on said ejector blade, a pair of guides on said bucket and cooperating with said camming surfaces for constraining the movement of said ejector blade to a prescribed path, and power means mounted on the back wall of said bucket for moving said ejector blade while being constrained between said guides.

3. In a power loader, a frame, a boom pivotally mounted to said frame, a link pivotally mounted to said frame, a bucket pivotally connected to said boom adjacent the end thereof remote from its pivotal connection to said frame, said bucket having a bottom and a back wall with a curved portion connecting said bottom and back wall, a pair of end walls, power means interposed between said link and said bucket for pivoting said bucket relative to said boom, an ejector blade spanning substantially the distance between said end walls for discharging the contents of said bucket, and means for moving said ejector blade from a position adjacent said back wall to a position where the contents of said bucket are discharged while following the contours of said curved portion and said bottom comprising a pair of camming surfaces on said

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ejector blade, means on said bucket and cooperating with said camming surfaces for constraining the movement of said ejector blade to a prescribed path, and power means mounted on said bucket for moving said ejector blade.

4. In a power loader, a frame, a boom pivotally mounted to said frame, a link pivotally mounted to said frame, a bucket pivotally connected to said boom adjacent the end thereof remote from its pivotal connection to said frame, said bucket having a bottom and a back wall with a curved portion connecting said bottom and back wall, a pair of end walls, power means interposed between said link and said bucket for pivoting said bucket relative to said boom, an ejector blade spanning substantially the distance between said end walls for discharging the contents of said bucket, and means for moving said ejector blade from a position adjacent said back wall to a position where the contents of said bucket are discharged while following the contours of said curved portion and said bottom comprising a cam fixed to said ejector blade, means on said bucket and cooperating with said cam for constraining the movement of said ejector blade to a prescribed path, and power means mounted on said bucket for moving said ejector blade.

5. An ejector bucket for a power loader comprising a bottom and a back wall with a curved portion connecting said bottom and back wall, a pair of spaced end walls, an ejector blade spanning substantially the distance between said end walls for discharging the contents of said bucket, and means for moving said ejector blade from a position adjacent said back wall to a position where the contents of said bucket are discharged while following the contours of said curved portion and said bottom comprising a pair of spaced camming surfaces on said ejector blade, means on said bucket comprising a pair of spaced guides having said spaced camming surfaces therebetween for constraining the movement of said ejector blade to the aforesaid path, and a fluid operator mounted on the back wall of said bucket for moving said ejector blade, said fluid operator consisting of a cylinder and piston connected between said bucket and said ejector blade and movable to positions relative to each other in accordance with the position of said ejector blade.

6. An ejector bucket for a power loader comprising a bottom and a back wall with a curved portion connecting said bottom and back wall, a pair of spaced end walls, an ejector blade spanning substantially the distance between said end walls for discharging the contents of said bucket, and means for moving said ejector blade from a position adjacent said back wall to a position where the contents of said bucket are discharged while following the contours of said curved portion and said bottom comprising a pair of camming surfaces on said ejector blade, a pair of spaced guides on said bucket and cooperating with said camming surfaces for constraining the movement of said ejector blade to the aforesaid path, and power means mounted on said bucket for moving said ejector blade.

7. An ejector bucket for a power loader comprising a bottom and a back wall with a curved portion connecting said bottom and back wall, a pair of spaced end walls, an ejector blade spanning substantially the distance between said end walls for discharging the contents of said bucket, and means for moving said ejector blade from a position adjacent said back wall to a position where the contents of said bucket are discharged while following the contours of said curved portion and said bottom comprising a pair of camming surfaces on said ejector blade, means on said bucket and cooperating with said camming surfaces for constraining the movement of said ejector blade to the aforesaid path, and power means mounted on said bucket for moving said ejector blade.

8. An ejector bucket for a power loader comprising a bottom and a back wall with a curved portion connecting said bottom and back wall, a pair of spaced end walls, an ejector blade spanning substantially the distance between

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said end walls for discharging the contents of said bucket, and means for moving said ejector blade from a position adjacent said back wall to a position where the contents of said bucket are discharged while following the contours of said curved portion and said bottom comprising a pair of camming surfaces on said ejector blade, means on said

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bucket and cooperating with said camming surfaces for constraining the movement of said ejector blade to the aforesaid path, and power means mounted on said bucket for moving said ejector blade.

No references cited.