United States Patent [19]

Meyer

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[54] **LOADER BUCKET WITH EJECTOR**

[75] Inventor: **Gustave Meyer**, Northglenn, Colo.

[73] Assignees: **Irvin L. Stumpf**, Wheat Ridge; **Raymond R. Primozich**, Westminster, both of Colo.; part interest to each

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[52] U.S. Cl. ..... **214/767**, 214/146 E, 214/82

[51] **Int. Cl.** **E02f 3/70**

[58] **Field of Search** ..... 214/146 E, 767, 510, 82

[56] **References Cited**

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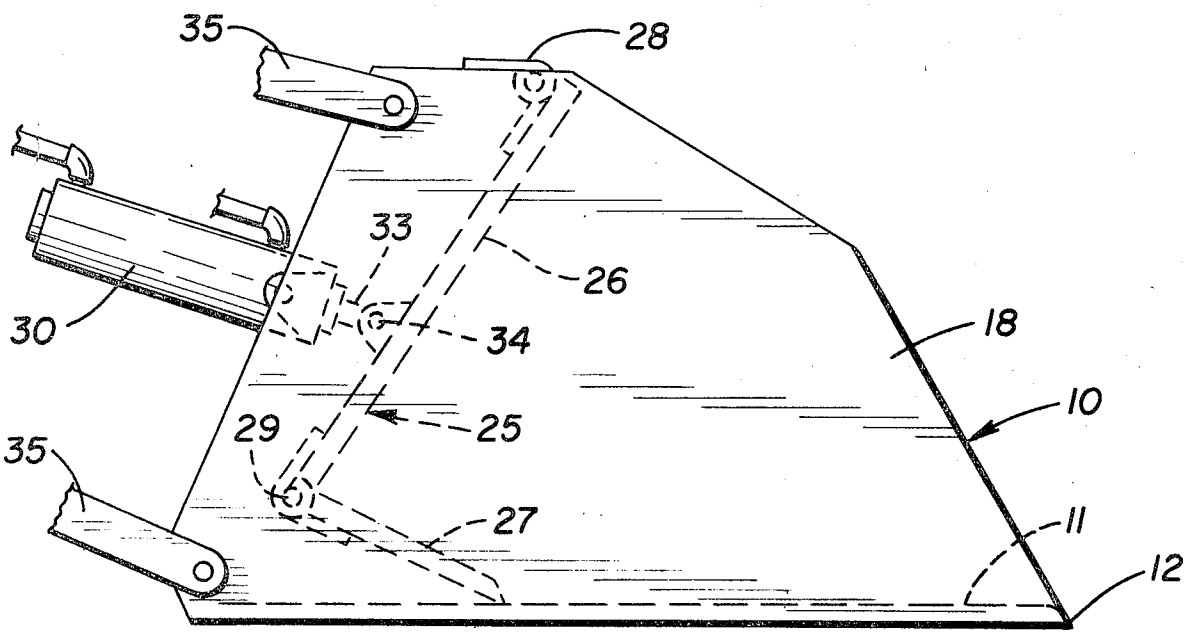
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Primary Examiner—Robert J. Spar
Assistant Examiner—John Mannix
Attorney, Agent, or Firm—Bertha L. MacGregor

[57] **ABSTRACT**

An ejector bucket for mounting on a front end loader or backhoe loader vehicle, provided with an ejector actuated by mechanism carried on the bucket. The ejector comprises two flat plates hingedly connected together, the upper plate being hinged to the forward edge of the top wall of the bucket. In their rearward retracted position, the ejector plates form an acute angle within the rearward portion of the bucket and close openings in the stationary frame-like rear wall and bottom of the bucket, whereby the structure as a whole is lightened. In their forward discharging position the hinged ejector plates are in a substantially single plane. The ejector actuating mechanism includes an hydraulic cylinder pivotally mounted on supports extending across the rear wall opening, and a piston pivotally connected to the upper ejector plate, whereby a short power stroke actuates the ejector for complete discharge of the contents without tilting the bucket, thus permitting operation within restricted areas.

3 Claims, 5 Drawing Figures



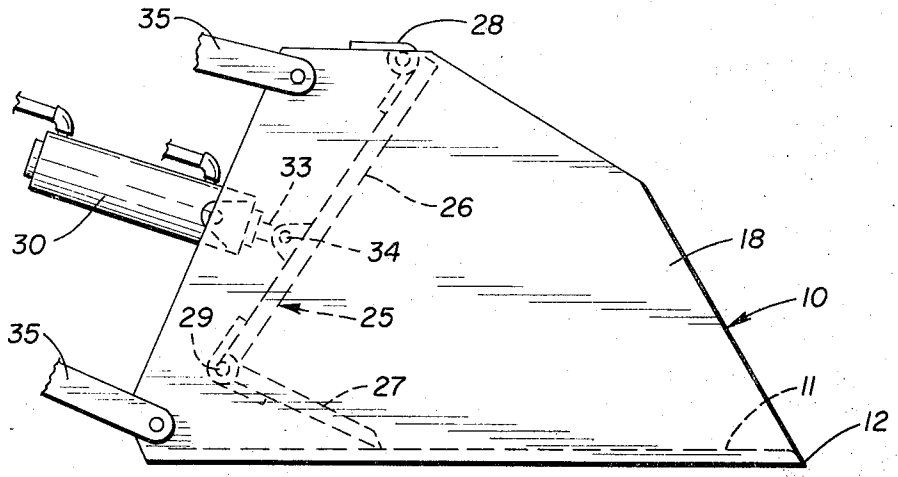

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Fig. 1

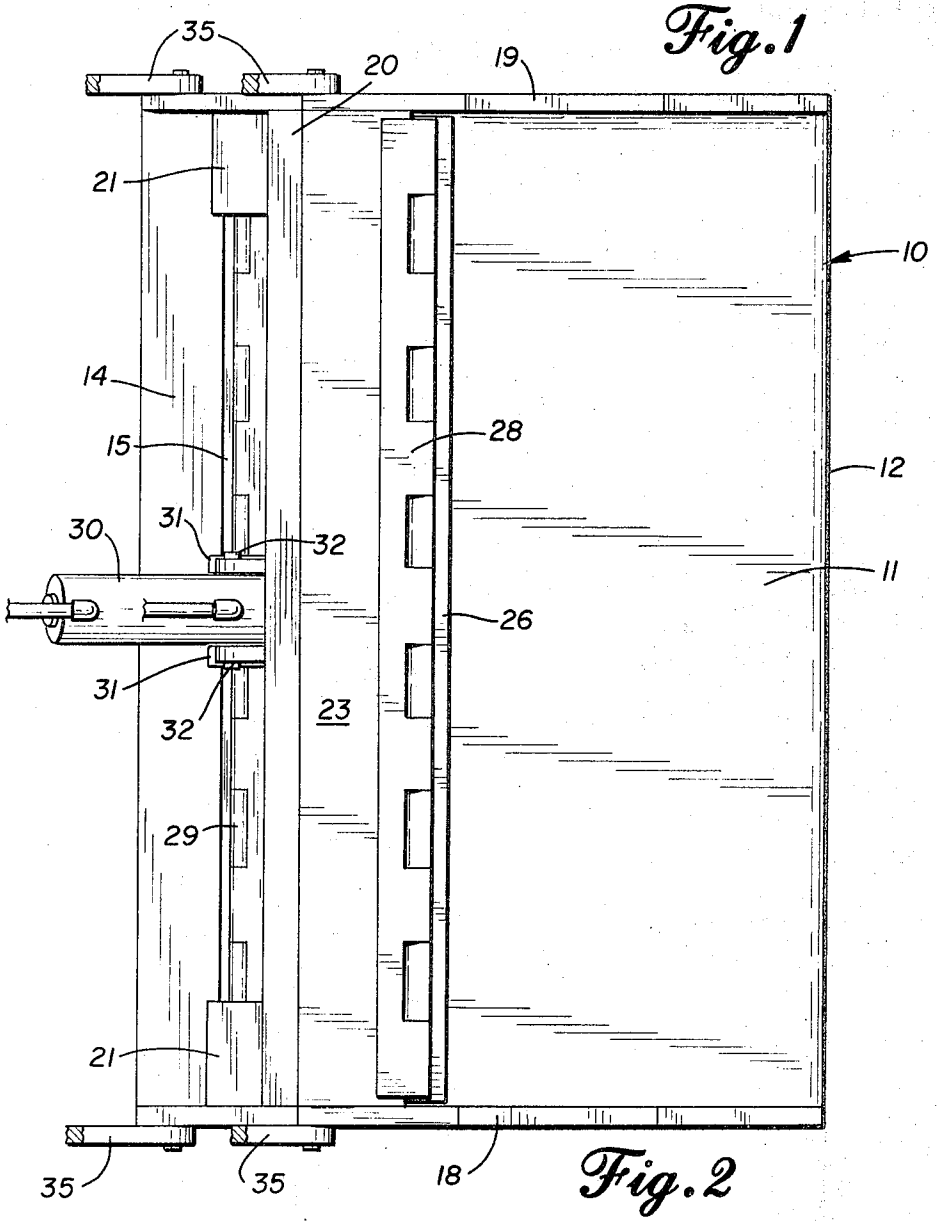

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Fig. 2

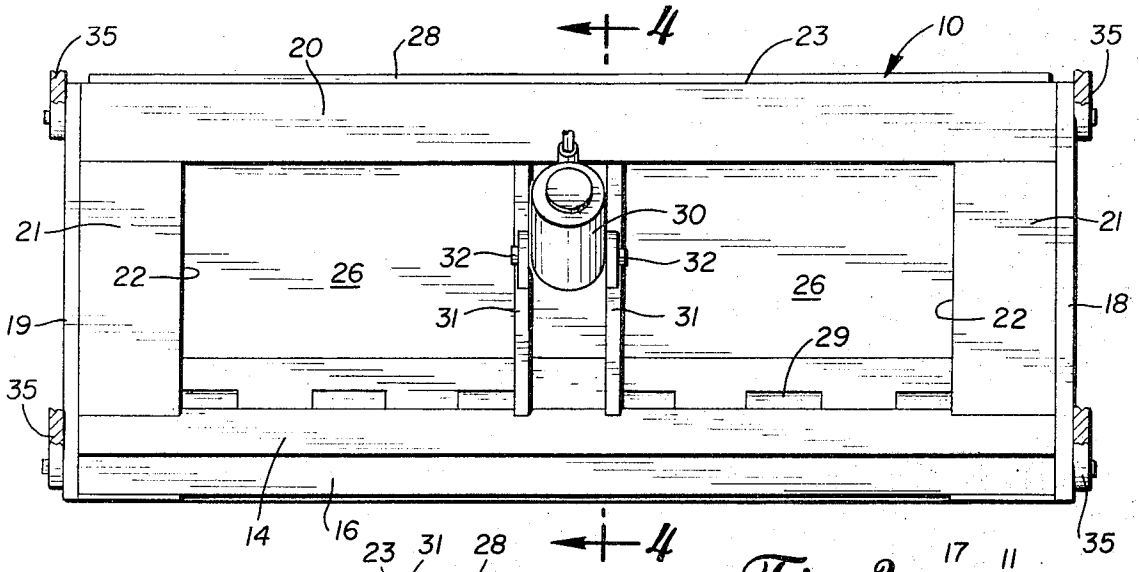


Fig. 3

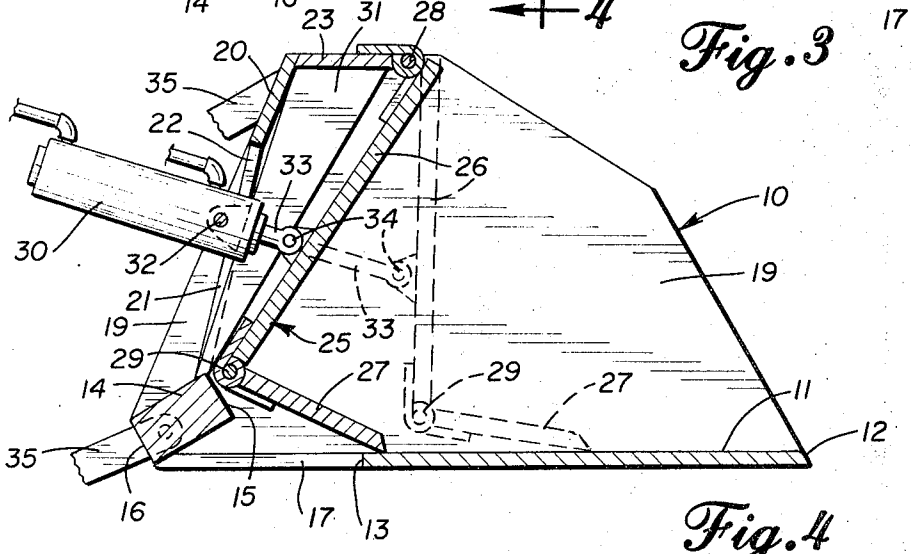


Fig. 4

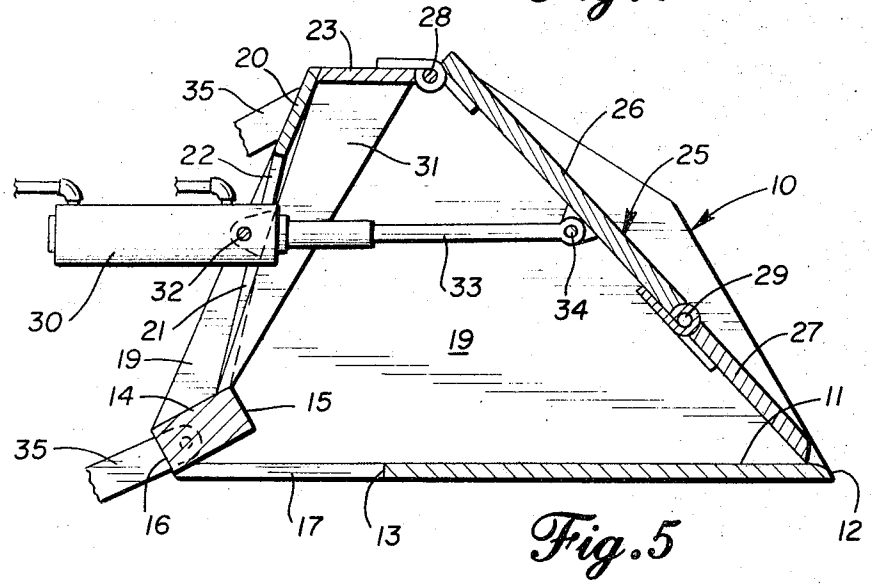


Fig. 5

LOADER BUCKET WITH EJECTOR

This invention relates to an ejector bucket adapted for mounting on a front end loader or a backhoe loader vehicle. The bucket is provided with an ejector actuated by mechanism carried by the bucket.

The object of the invention is to provide an exceptionally compact ejector bucket in which the ejector, in its retracted loading position, serves as an auxiliary rear wall and bottom for the bucket to close openings in the stationary rear wall and bottom of the bucket. Thus the bucket structure as a whole is lightened without detracting from its efficiency for its intended purposes.

Another object of the invention is to provide ejector actuating mechanism carried by the bucket which includes an hydraulic cylinder mounted pivotally on the rear wall of the bucket and a piston directly connected to the upper of two ejector plates hingedly connected together. The upper ejector plate is hingedly connected to the forward edge of the top of the bucket in such relationship that the ejector as a whole, when retracted, forms an acute angle and is located entirely within the rearward portion of the bucket beneath the top wall thereof. Therefore only a short power stroke of the piston is required to actuate the ejector and move the ejector plates into a single plane for completely discharging the bucket contents without tilting the bucket.

The construction is such that the ejector bucket can be loaded and its contents discharged within restricted areas, and the bucket as a whole may be passed through windows or other openings only slightly larger than the bucket per se. The shape of the bucket assures visibility of its contents to the operator of the loader vehicle at all times.

In the drawings:

FIG. 1 is an elevational side view of an ejector bucket embodying my invention, in loading position.

FIG. 2 is a top plan view of the same.

FIG. 3 is an elevational rear view of the bucket.

FIG. 4 is a transverse vertical sectional view in the plane of the line 4--4 of FIG. 3, showing in solid lines the ejector in retracted loading position, and in broken lines the ejector in a position intermediate its loading and full ejecting positions.

FIG. 5 is a transverse vertical sectional view similar to FIG. 4, showing the ejector in its full ejecting position.

In the embodiment of the invention shown in the drawings, the bucket 10 comprises a flat bottom 11 which extends across the bucket from side to side and from the forward edge 12 to a rearward edge 13, spaced from a rearward longitudinally extending bar 14, inclined downwardly from its inner surface 15 to its outer surface 16. The rearward portion of the bottom 11 is open as indicated by the space 17 in FIGS. 4 and 5. The bucket 10 also comprises side walls, 18 and 19, respectively, having a horizontal lower edge portion fastened to the bucket bottom 11 and to the end surfaces of the inclined bar 14. The bucket rear wall consists of an upper panel 20 connected to the rear upper portion of the side walls 18 and 19, and connected to the bar 14 by spaced side members 21, 21, providing a space 22 between the upper panel 20 and the lower inclined bar 14. The horizontal top wall 23 is connected to the side walls 18 and 19 and extends longitudinally of the bucket, parallel to the bottom 11, and is

relatively narrow transversely of the bucket as shown in FIGS. 2, 4 and 5, with the rear upper panel 20 extending at an obtuse angle thereto. The narrow top wall 23 assures good visibility to the operator of the vehicle of the interior of the bucket during the loading operation, and also provides efficient mounting means for the ejector 25 pivotally connected to said top wall.

The ejector 25 comprises two flat plates, 26 and 27, respectively, which extend longitudinally across the bucket between the side walls 18 and 19. The upper plate 26 is relatively wide as compared to the lower plate 27. The upper plate 26 is hingedly connected to the forward edge of the top 23 by a hinge member 28, and the lower ejector plate 27 is hingedly connected to the upper plate by hinge member 29. The ejector plate 26 covers the space 22 between the upper rear panel 20 and the lower inclined bar 14 of the rear of the bucket, and thus functions as a substantial part of the rear wall of the bucket when the ejector 25 is in the loading position shown in FIG. 1 and the sectional view FIG. 4. In that position of the ejector, the lower plate 27 also covers the bottom space 17 and thus functions as part of the bottom of the bucket. This arrangement lightens the bucket structure without detracting from its efficiency. In its fully retracted loading position, the ejector plate 26 extends downwardly and rearwardly from the hinge 28, and forms an acute angle with the ejector plate 27, as shown in FIG. 4, occupying only limited space within the bucket beneath the top wall 23 and slightly rearwardly thereof.

The ejector 25 is actuated by a double acting hydraulic mechanism 30 mounted by pivotal means 32 between a pair of parallel supports 31 extending from the inclined bar 14 to the rear upper panel 20 across the opening 22. The hydraulic piston 33 is pivotally connected at 34 to the upper ejector plate 26 as shown in FIGS. 4 and 5. The hydraulic mechanism may be connected by any flexible means (not shown) to the engine of the vehicle.

The bucket 10 as a whole may be mounted on and connected to the loader vehicle by pivotally mounted links 35, or other means.

The form of the bucket, per se, and the location of the ejector in the bucket, as well as the form of the ejector, all cooperate to provide an ejector bucket which can be loaded and can discharge its load within a limited space. For example, the bucket may be utilized to load earth from one area and deliver it through a window or other restricted space only slightly larger than the dimensions of the bucket. The usual tilting of the bucket to discharge its contents is made unnecessary by the ejector, and the construction of the ejector is such that its entire contents are discharged when the two flat plates are actuated into their single plane positions, as shown in FIG. 5. The pivotal mounting of the hydraulic cylinder directly on the bucket, whereby the piston 33 travels within the confines of the bucket, through the rear wall opening 22, results in a very compact ejector bucket construction. The short stroke of the piston between the pivotal cylinder mounting on the bucket and the piston connection to the ejector produces a power stroke with minimum friction and lost motion.

It is to be understood that the ejector bucket of my invention may be embodied in any material handling equipment and is not limited to loader or backhoe loader vehicles. Further, the ejector actuating mecha-

nism includes an hydraulic cylinder or other mechanical linkage or power, connected by any flexible means to the vehicle engine or other power source.

The form of the ejector is such that the bucket is completely emptied in each operation and thus is self-cleaning.

I claim:

1. An ejector bucket which is portable and self-contained, including as a unit ejector plates and actuating means mountable as a unit on a loader vehicle, comprising

a. an open front bucket having a frame-like rear wall with substantial sized openings therein, a bottom wall which has an open area adjacent its rear, and a narrow top wall extending across the bucket adjacent and forwardly of the rear wall between opposite side walls,

b. an ejector comprising a pair of flat upper and lower plates hingedly connected together, the upper of the plates being hingedly connected to the forward edge of the top wall, said plates when in retracted position covering the openings in the rear wall and bottom, and the lower plate in said retracted position being in load carrying position, said plates being movable into a single plane load pushing position wherein the lower ejector plate bears on the bottom of the bucket, and material collected between said ejector plates and bucket walls passes out through the openings in said rear and bottom walls, and

c. a single piston ejector-actuating mechanism which is engine activated and includes an ejector actuating cylinder having its front portion pivotally connected to the frame-like rear wall of the bucket, extending through the open area of the rear wall and pivotally connected to the said upper ejector plate on its rear surface for moving said ejector plates into a single plane self-cleaning load discharge position wherein the forward face of the ejector plates is free of load engaging projections,

d. said ejector-bucket unit being mountable on a loader and readily demountable by means independent of the single piston ejector-actuating mechanism.

2. The ejector bucket defined by claim **1,** in which the rear wall has a central opening and includes a pair of spaced supports extending across said central opening on which the ejector actuating cylinder is pivotally mounted.

3. The ejector bucket defined by claim **1,** in which the ejector actuating cylinder and its piston are in a substantially horizontal plane parallel to the bottom of the bucket when the ejector plates have been moved to a single plane position between the forward edge of the top wall and the front edge of the bucket bottom.

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