Feb. 14, 1967 H. W. ROCKWELL 3,303,587

EARTHMOVER

Filed March 6, 1964 2 Sheets-Sheet 1

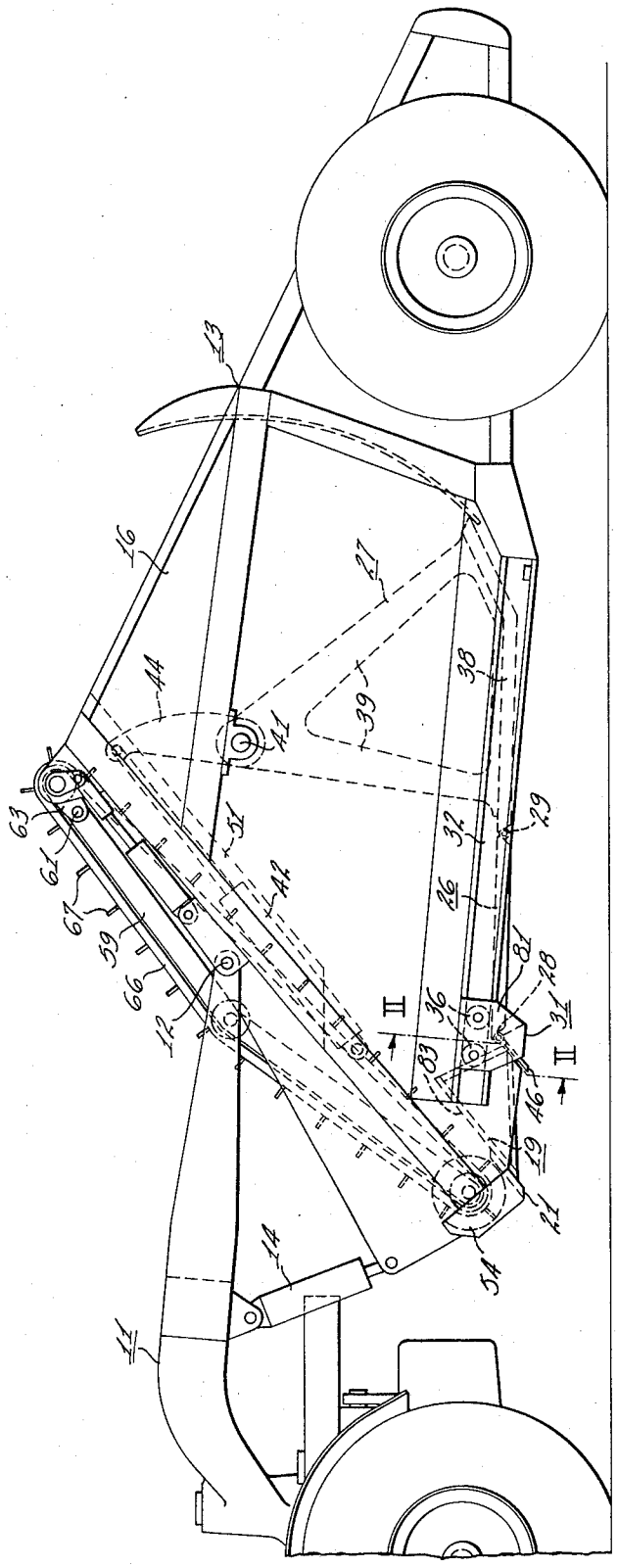


Fig. 1

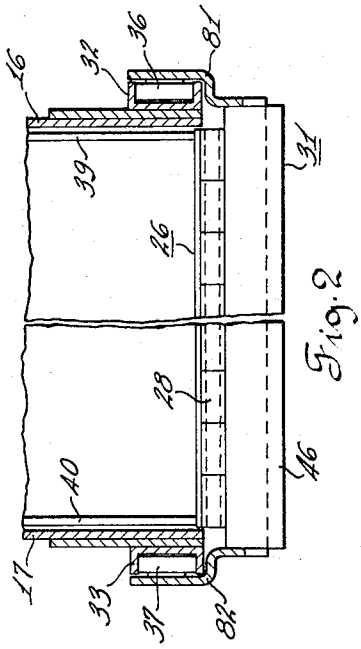


Fig. 2

Inventor
Harvey W. Rockwell
By Charles L. Schwab
Attorney

Feb. 14, 1967 H. W. ROCKWELL 3,303,587

EARTHMOVER

Filed March 6, 1964 2 Sheets-Sheet 2

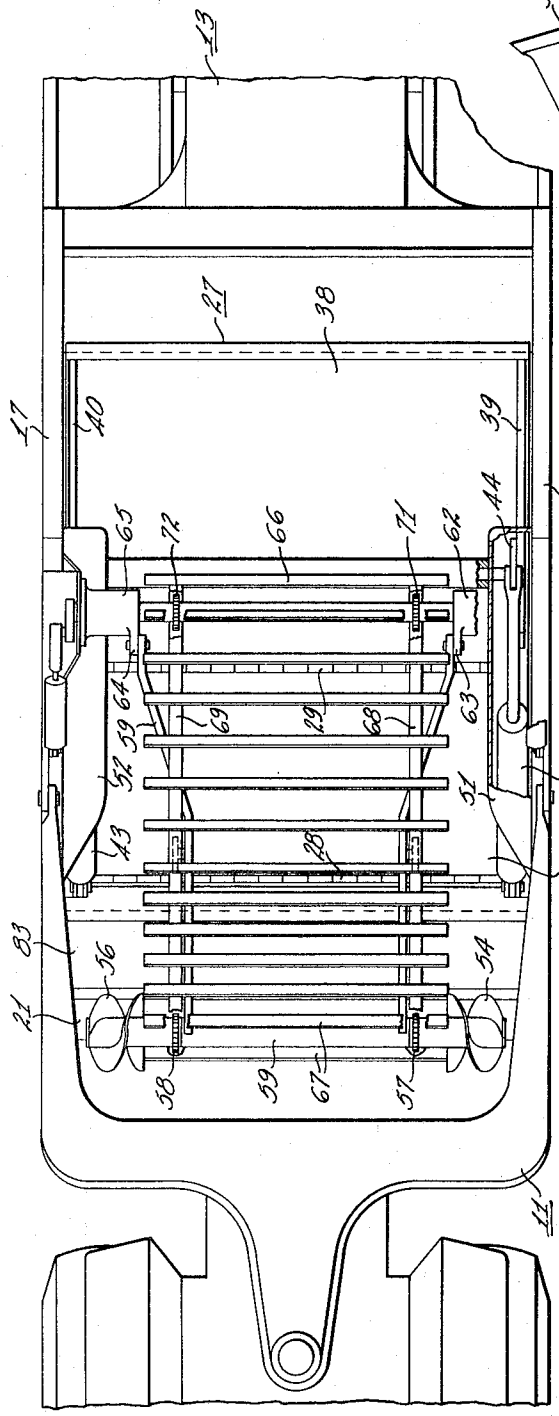


Fig. 3

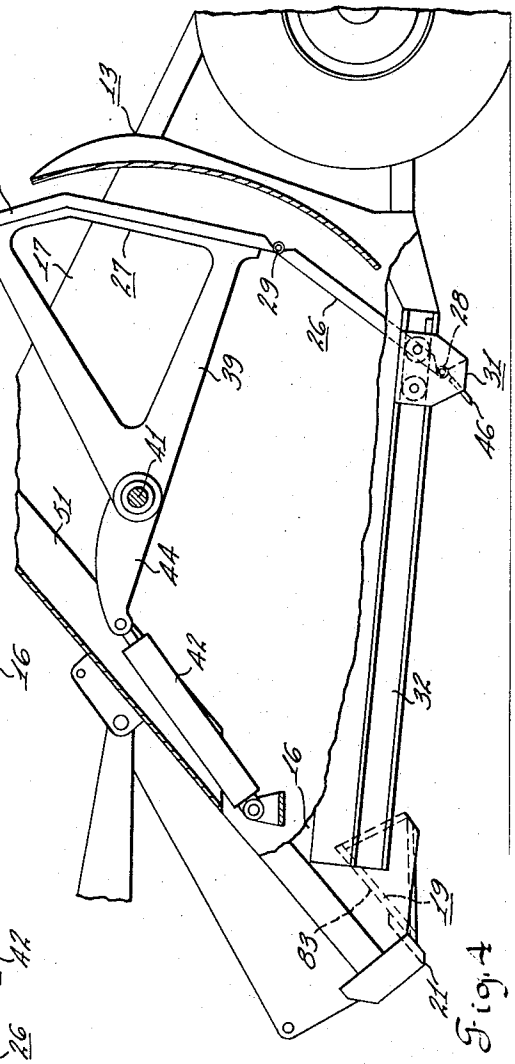


Fig. 4

Inventor
Harvey W. Rockwell
By Charles L. Schwab
Attorney

United States Patent Office 3,303,587 Patented Feb. 14, 1967

3,303,587

EARTHMOVER

Harvey W. Rockwell, Cedar Rapids, Iowa, assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Mar. 6, 1964, Ser. No. 349,962
9 Claims. (Cl. 37—8)

This invention relates to an improved ejection mechanism for an earthmover and particularly to an ejection mechanism in the form of a retractable bottom. This invention also relates to the elevating, self-loading type scraper.

The elevating, self-loading motor scraper has been used successfully in moving sand, loose earth or other fine materials. Although materials of this type are easily ejected from the scraper bowl, an ejection problem exists for this type of machine because of the elevating mechanism being positioned in the front of the scraper thereby precluding front ejection. Previous designs have used a partial bottom opening in combination with a pushout type ejector. Such designs are obviously limited to free flowing materials of small particle size. To provide an ejection system capable of handling a wider range of materials, I have devised a retractable bottom and strikeoff mechanism which provides full bottom opening.

It is an object of this invention to provide an ejection mechanism for an earthmover bowl which provides full bottom opening.

It is a further object of this invention to provide a combined strikeoff edge and retractable bottom mechanism.

It is a further object of this invention to provide an improved ejection mechanism for an elevating, self-loading scraper which permits relatively long bowl construction with full bottom opening during ejection.

In designing my full bottom opening type ejection mechanism for an elevating type scraper, of the type having an endless conveyer at its forward end, I found it desirable to position a pair of hydraulic jacks for actuating the ejection mechanism, adjacent the inner sides of the bowl side walls. In order to prevent material from packing on the underside of these jacks I provide means at each side of the elevating mechanism to move the material passing into the bowl toward the center of the bowl.

Accordingly, it is a further object of this invention to provide means on the elevating mechanism of the motor scraper for urging the excavated material being loaded toward the longitudinal center of the scraper bowl.

These and other objects and advantages of my invention will be apparent from the following description when read in conjunction with the drawings in which:

FIG. 1 is a side view of an earthmover incorporating my invention;

FIG. 2 is an enlarged section view taken along the lines II—II of FIG. 1;

FIG. 3 is a top view of the earthmover shown in FIG. 1; and

FIG. 4 is a side view partially in section showing the bottom and strikeoff mechanism in an open or ejecting position.

Referring to FIG. 1, a front wheeled draft frame **11** is pivotally connected on a transverse axis **12** to a rear wheeled bowl frame **13** for relative vertical swinging movement under the control of power means in the form of a pair of double acting hydraulic jacks **14**, only one of which is illustrated.

Referring also to FIG. 3, the bowl or bowl frame **13** includes a pair of laterally spaced side walls **16, 17** and

a transversely extending excavating blade structure **19** rigidly secured at its opposite lateral ends to the side walls **16, 17**. A cutting edge **21** is replaceably secured to the exacavating blade structure **19**.

In order to provide a full bottom opening, I provide a bottom mechanism which includes a front section **26** and a rear section **27**. The forward section **26** is carried by front and rear hinges **28, 29**, the latter of which pivotally interconnects the rear end of the front section **26** to the forward end of the rear section on a transverse pivot axis. The hinge **28** pivotally interconnects a transverse strikeoff structure **31** on a transverse pivot axis. Carriages **81, 82** are secured as by welding to opposite ends of the strikeoff structure **31**. The carriages **81, 82** rotatably carry rollers **36, 37**, respectively, which in turn are carried by tracks **32, 33** rigidly secured to the side walls **16, 17**.

The rear bottom section **27** includes a bottom wall **38** and a pair of upstanding legs **39, 40**. The legs are pivotally connected to the side walls **16, 17** on a transverse pivot axis **41** and the rear bottom section **27** is actuated between closed and open positions by a pair of hydraulic jacks **42, 43**. The rod end of jack **42** is pivotally connected to an arm **44** which forms an extension of leg **39**. Jack **43** is similarly connected to leg **40**. When the jacks **42, 43** are contracted, the bottom and strikeoff structure will move to the full open position shown in FIG. 4 wherein all the material within the bowl will easily be dumped. This position may also be referred to as an ejection or dumping position. As the jacks **42, 43** are contracted, the strikeoff blade **46** will move rearwardly in a straight line and serve to evenly spread the material being dumped. If the bowl is adjusted by jacks **14** to place the tracks **32, 33** parallel to the ground, the material being dumped will be spread on the ground at a uniform thickness.

A pair of guards **51, 52** are provided above the jacks **42, 43** to protect them from excavated material. Augers **54, 56** which are secured to idler sprockets **57, 58** move the excavated material inwardly toward the longitudinal center of the bowl thereby preventing packing beneath the jacks **42, 43**. The conveyer mechanism frame **59** is pivoted at its upper end on a transverse axis **61** to brackets **63, 64** extending forwardly from conveyer supports **62, 65**, which in turn are rigidly secured to the side walls **16, 17** of the bowl. The underside of the conveyer **66** moves upwardly during operation whereby the slats **67** move the material up the ramp portion **83** of the excavating blade structure **19**. The slats **67** are secured to a pair of link type chains **68, 69** carried on driving sprockets **71, 82** and idler wheels in the form of sprockets **57, 58**.

From the foregoing description it is apparent that I have provided a novel bottom opening mechanism and strikeoff structure which achieves a full bottom opening and complete material ejection. This dumping mechanism is particularly adapted to use in relatively long scraper bowls and particularly lends itself to use in an elevating, self-loading type scraper.

The embodiments of the invention for which an exclusive property or privilege is claimed are defined as follows:

1. An earthmover comprising:
an open bottom bowl including
a pair of laterally spaced vertical side walls,
a transversely extending excavating blade structure secured at its laterally opposite ends to the lower forward portions of said side walls, respectively, and
a transversely extending rear wall interconnecting the rear ends of said side walls,

a rear bottom section having
a bottom wall extending transversely between the lower portion of said side walls and
a pair of upstanding legs secured to said bottom wall and disposed adjacent the inner side of said side walls
means pivotally connecting said legs to said side walls on a first transverse pivot axis spaced from said bottom wall,
power means between said bowl and said rear bottom section for pivoting the latter between bottom closed and bottom open positions,
a front bottom section extending transversely between said lower portions of said side walls,
means pivotally connecting the rear end of said front bottom section to the forward end of said bottom wall on a second transverse pivot axis,
a longitudinally extending supporting track adjacent the bottom of each of said side walls, said tracks being parallel to one another and extending between said excavating blade structure and said rear wall,
a transversely extending strikeoff structure at the rear of said excavating blade structure and carried by said tracks for longitudinal reciprocating movement, and
means pivotally connecting the forward end of said front section to said strikeoff structure on a third transverse axis, said axes being parallel to one another.

2. The structure set forth in claim 1 and further comprising a pair of rollers pivotally mounted on each of the laterally opposite ends of said strikeoff structure in rolling vertical load carrying contact with said tracks, respectively.

3. The structure set forth in claim 1 wherein said power means comprise a pair of hydraulic jacks operatively interconnecting said walls and said legs, respectively.

4. The structure set forth in claim 3 and further comprising a conveyer mechanism comprising
an inclined frame pivotally secured at its upper rear to said bowl on a transverse axis,
a pair of laterally spaced rotary supporting wheels on the lower forward end of said frame,
a slat type endless conveyer carried on said wheels,
an auger secured for rotation in unison with each of said wheels and extending axially outwardly therefrom laterally beyond said conveyer and
means for driving said conveyer.

5. The structure set forth in claim 4 wherein said wheels are sprockets and said conveyer includes a pair of link type chains meshing with said sprockets.

6. An earthmover comprising:
a wheeled draft frame,
a wheeled bowl frame connected to said draft frame for vertical swinging movement having
a pair of laterally spaced vertical side walls and
a transversely extending excavating blade structure rigidly secured at its opposite ends to the lower forward portions of said side walls, respectively, and
a bottom closure and dumping structure including
a rear bottom section pivotally secured to said side walls on a first transverse axis spaced above the bottom of said walls,
power means for pivoting said rear bottom secsecion about said first axis between closed and dumping positions,
a front bottom section having its rear end pivotally connected to the forward end of said rear bottom section on a second transverse axis,
longitudinally extending track means on said side walls, and
a transverse strikeoff structure at the rear of said excavating blade structure pivotally connected to the forward end of said front bottom section on a third transverse axis and reciprocally carried at its transversely opposite ends in said track means.

7. The structure set forth in claim 6 wherein said strikeoff structure includes a pair of rollers at each of its opposite ends in vertical load carrying relation to said track means, respectively.

8. The structure set forth in claim 7 wherein said track means are channel members secured to the outer sides of said side walls, respectively.

9. The structure set forth in claim 8 wherein said bowl frame includes an upstanding rear wall and said power means includes a pair of hydraulic jacks connected to said side walls, respectively, and to said rear bottom section.

References Cited by the Examiner

UNITED STATES PATENTS

2,988,832	6/1961	Hancock et al.	37—129
3,030,080	4/1962	Hise et al.	37—8 X
3,057,090	10/1962	Mazzarins	37—126
3,108,388	10/1963	Johnson	37—8 X

ABRAHAM G. STONE, *Primary Examiner.*

WILLIAM A. SMITH III, *Examiner.*