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SCRAPER BOTTOM DUMP MECHANISM

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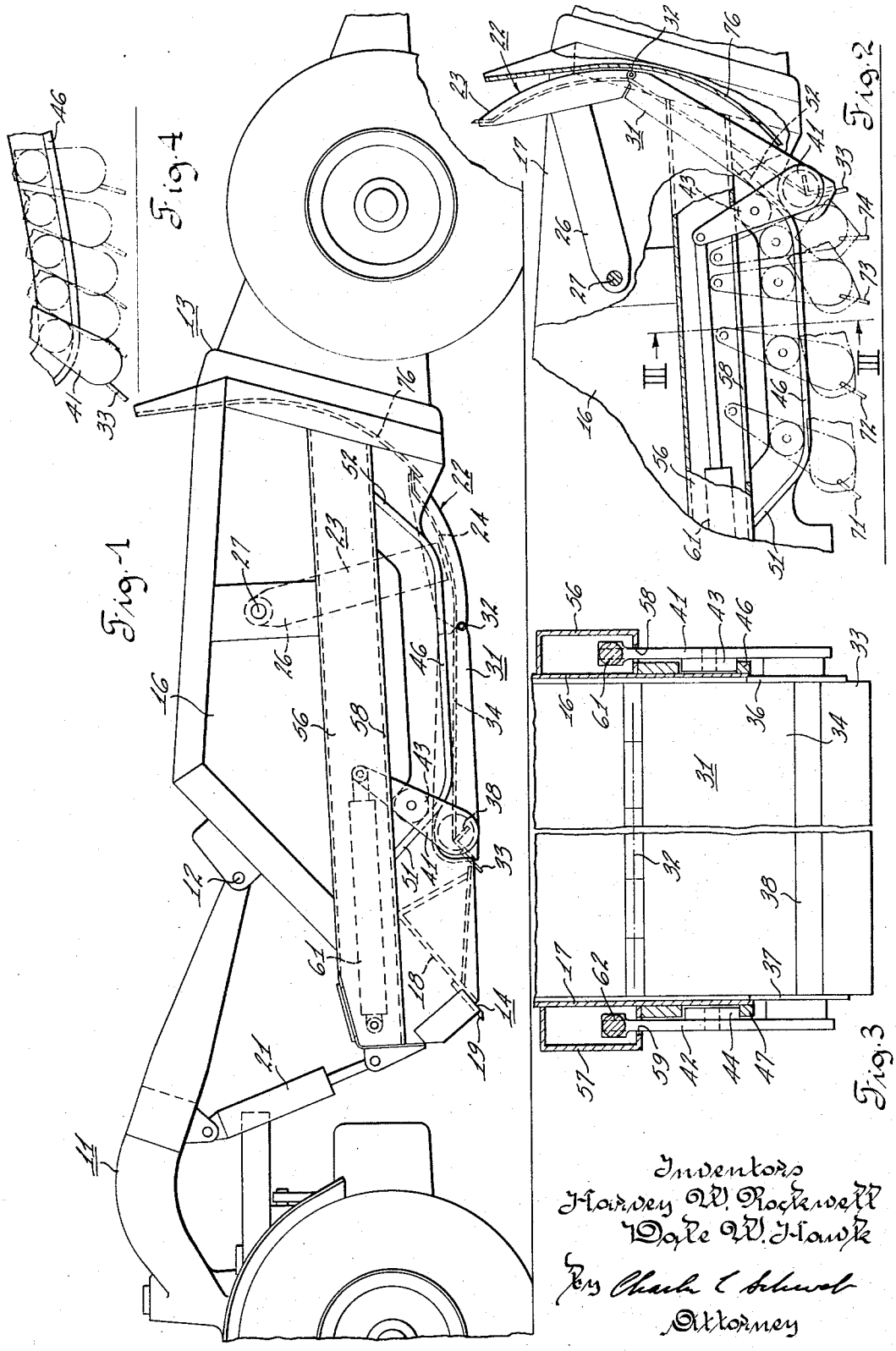


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Inventors
Harvey W. Rockwell
Doyle W. Hawk
By Charles C. Schmidt
Attorney

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SCRAPER BOTTOM DUMP MECHANISM

Harvey W. Rockwell, Cedar Rapids, and Dale W. Hawk, Marion, Iowa, assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

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This invention relates to a bowl type earthmover having a bottom opening type ejection mechanism.

In the copending patent application of Harvey W. Rockwell on an earthmover, a two section bottom dump mechanism is illustrated wherein a strikeoff structure is pivotally secured to the front section and the rear section to which the front section is pivoted, is pivoted to the side walls of the bowl. Also, the beforementioned bottom dump mechanism is actuated by a pair of hydraulic jacks disposed on the inside of the bowl walls. Hydraulic jacks so located reduce the volume of the bowl, are subject to packing on the underside by excavated material, and operate in a very dirty environment which may tend to accelerate wear.

It is an object of the present invention to provide a bowl type earthmover having a bottom dump mechanism including a rear section pivoted on a transverse axis to the side walls of the bowl and a front section pivoted to the rear section at its rear end and carrying the strikeoff edge rigidly at its forward end.

It is a further object of this invention to provide an improved bottom retracting type ejection mechanism of the hinged section type wherein guide means are provided for the front end of the froward section which follow a curved path during retraction from a closed position to a dumping position.

It is a further object of this invention to provide a bottom dumping mechanism including a pair of hydraulic jacks disposed within hollow frame portions of the side walls.

It is a further object of this invention to provide a two section hinged type bottom dumping mechanism carrying a strikeoff edge on the forward end of the front section of the bottom wherein guide means for the forward end of the front bottom section includes inclined ramp portions whereby, in the closed position of the bowl bottom mechanism, the strike off edge is elevated sufficiently to not interfere with excavation achieved with the excavating blade and wherein the initial opening movement of the bottom mechanism drops the strikeoff edge downwardly to a position below the excavating blade.

It is a further object of this invention to provide a bottom dump mechanism of the hereinbefore outlined character and having means for raising the strikeoff edge during the final retraction movement of the bottom dump mechanism.

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

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

FIG. 2 is a partial side view of the earthmover shown in FIG. 1 with the bottom dump mechanism in a retracted or dumping position;

FIG. 3 is a section view taken along the line III—III in FIG. 2; and

FIG. 4 is a side view of a modified track.

Referring to FIG. 1, the earthmover includes a wheeled draft frame **11** pivotally connected on a transverse axis **12** to a wheeled bowl **13**. An excavating blade structure **14** is rigidly secured, as by welding, to the forward lower portions of the side walls **16, 17**. The blade structure inculdes an upwardly inclined ramp **18** and a replaceable blade element **19**. The ramp **18** is of the type usually employed with an elevating type scraper using an endless conveyer such as is shown in the copending patent application of Harvey W. Rockwell, Earthmover. The blade structure **14** is in a nonexcavting or transport position in FIG. 1, and may be lowered to an excavating position by vertical swinging movement of the bowl **13** about axis **12** by expansion of double acting hydraulic jacks **21**, only one of which is shown, interconnected between the bowl and draft frame **11**.

A bottom dumping mechanism **22** of novel construction is provided for the open bottom bowl **13**. The bottom dumping mechanism **22** includes a rear bottom section **23** having a bottom wall **24** and a pair of upstanding legs **26**, only one of which is illustrated, which are connected by pins to the side walls **16, 17**, respectively, for vertical swinging movement about transverse axis **27**. The bottom mechanism also includes a forward bottom section **31** pivotally connected at its rear end by a piano hinge joint to the forward end of the rear bottom section **23** for relative movement about a transverse axis **32**. A strikeoff edge **33** is rigidly secured to the forward end of the front section **31**. Referring also to FIG. 3, the front section **31** includes a flat bottom wall **34** secured as by welding to reinforcing side panels **36, 37** and to a transversely extending angle **38** to which a replaceable strikeoff edge **33** is attached. A pair of arms **41, 42** are rigidly secured to the reinforcing panels **36, 37** and pivotally carry rollers **43, 44** guided in tracks **46, 47** secured as by welding to the side walls **16, 17**, respectively.

The tracks **46, 47** each have an upwardly and forwardly inclined ramp portion at their forward end, as shown in FIGS. 1 and 2. The forward ramp portion for track **46** is designated **51**. Both of the tracks **46, 47** are curved in a vertical direction in such a manner as to provide a substantially straight line movement of the strikeoff edge **33** through a substantial portion of its movement between the closed position illustrated in FIG. 1 and the open position, illustrated in FIG. 2. An upwardly and rearwardly inclined portion is provided for each of the tracks **46, 47** at their rear ends to facilitate full ejection of any material having stubborn unloading characteristics. The final upward movement of the strikeoff edge **33** permits it to clear large boulders being dumper from the bowl. The upwardly and rearwardly inclined ramp portion of track **46** is designated **52**.

The side walls **16, 17** include hollow structural side frame portions **56, 57** having slots **58, 59** on their bottom sides through which arms **41, 42** extend. A pair of double acting hydraulic jacks **61, 62** are disposed within the hollow box section frame portions **56, 57** and are pivotally connected at the rod ends to the portions of the arms **41, 42** which extend upwardly through the slots **58, 59**. The cylinder portion of the double acting hydraulic jacks **61, 62** are pivotally connected to the box section portions **56, 57**. The hollow frame portions **56, 57** serve the double function of major structural beams and protective housings for the double acting hydraulic jacks **61, 62**. This location of the jacks **61, 62** does not increase the overall width of the scraper appreciably.

As illustrated in FIG. 2, the straight portions of the tracks maintain the strikeoff edge **33** in substantially straight line position during the major portion of the retraction movement of the bottom mechanism thereby permitting the operator to evenly spread the material being dumped. The phantom positions **71, 72, 73, 74** show the strikeoff edge **33** during dumping movement. As the roller **43** moves down the ramp **46** the strikeoff edge **33** is initially lowered to a position below the elevation of the cutting blade **19**. As the strikeoff edge **33** moves through the positions **71, 72, 73, 74**, the rear edge

of the bottom wall **24** maintains a close relationship with the curved portion of rear wall **76** of the scraper bowl **13**. When large rocks or the like are in the bowl, the operator may move the ejection mechanism to its fully retracted position, illustrated in FIG. 2, wherein the roller **43** has moved up the rear ramp **52**.

From the foregoing description, it is apparent that we have provided a novel bottom dumping mechanism for a scraper bowl. The provision of a strikeoff structure on the front end of the front section **31** provides a rugged construction which is relatively inexpensive compared to other designs. The tracks **46**, **47** effect a relatively straight line action of the strikeoff edge. However, if fine topping work is to be done with the scraper, the central portion of the tracks **46**, **47** may be bowed upwardly an appropriate extent to achieve a true straight line action of the strikeoff edge during retraction of the dumping mechanism. Such a track curvature is shown in FIG. 4.

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

1. An earthmover comprising:

a wheeled draft frame,

a wheeled scraper bowl pivotally connected to said draft frame for vertical swinging movement about a transverse pivot axis including

a pair of transversely spaced side walls,

a transversely extending excavating blade structure rigidly secured at its opposite ends to the lower forward portions of said side walls, respectively,

transversely extending means rigidly interconnecting the rear portions of said side walls and

a pair of longitudinally extending tracks on said side walls, respectively,

a bottom dump mechanism for said bowl including

a rear bottom section pivotally secured to said bowl on a transverse axis spaced forwardly of said transversely extending means and above the bottom of said side walls,

a front bottom section having a rear portion pivotally secured to the forward portion of said rear section on a transverse pivot axis and having a strikeoff edge rigidly secured to its forward portion,

support means connecting said forward portion of said front bottom section to said tracks for movement therealong and vertical load support thereby, and

power means for moving said bottom dump mechanism between closed and open positions.

2. The structure set forth in claim **1** wherein said support means includes a pair of rollers secured to opposite lateral ends, respectively, of said forward portion of said front bottom section and in rolling load carrying engagement with said tracks, respectively.

3. The structure set forth in claim **2** wherein said power means includes a pair of longitudinally disposed hydraulic jacks adjacent the outer sides of said side walls, respectively, interconnecting said front bottom section and said bowl.

4. The structure set forth in claim **3** wherein each of said side walls has a longitudinally extending hollow frame section and wherein said jacks are disposed within said hollow frame sections, respectively.

5. The structure set forth in claim **4** wherein said front bottom section includes a pair of upstanding arms adjacent the outer side of said side walls, respectively, carrying said rollers, respectively, and pivotally connected to said jacks, respectively.

6. The structure set forth in claim **5** wherein each of said hollow frame sections has a longitudinally extending slot at the bottom thereof and wherein said arms extend upwardly through said slots, respectively.

7. The structure set forth in claim **2** wherein said tracks have upwardly and forwardly inclined ramps at their forward ends, respectively, in guiding and load carrying relation to said rollers, respectively, said rollers being supported on said ramps in said closed position of said bottom dump mechanism.

8. The structure set forth in claim **7** wherein said tracks have upwardly and rearwardly inclined ramps at their rear ends, respectively, in guiding and load carrying relation to said rollers, said rollers being supported on said upwardly and rearwardly inclined ramps in the open position of said bottom dump mechanism.

References Cited by the Examiner

UNITED STATES PATENTS

2,220,472	11/1940	Brodersen	37—126
3,057,090	10/1962	Mazzarins	37—126
3,108,388	10/1963	Johnson	37—8

ANTONIO F. GUIDA, *Acting Primary Examiner.*

WILLIAM A. SMITH III, *Examiner.*