

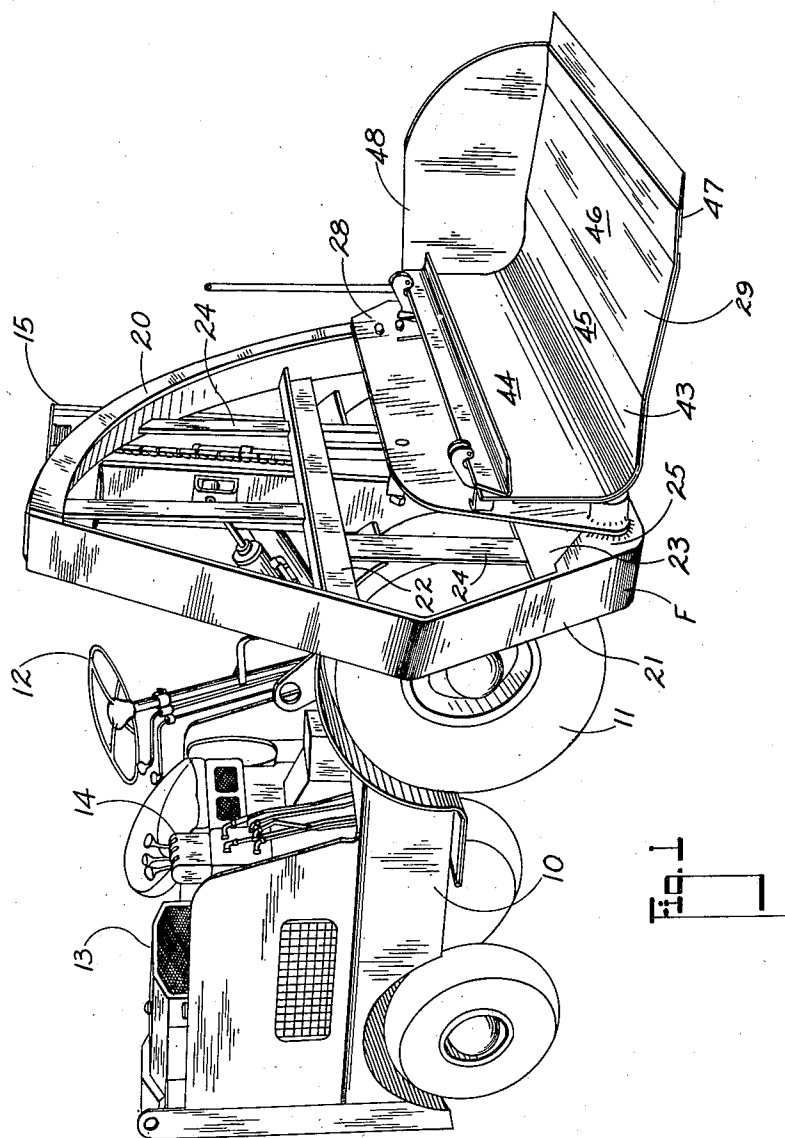
Feb. 12, 1952

L. C. DANIELS
SIDE-DUMPING SCOOP

2,585,095

Filed Feb. 19, 1948

4 Sheets-Sheet 1



INVENTOR.
LEE C. DANIELS

BY

Ridley & Watts
ATTORNEYS

Feb. 12, 1952

L. C. DANIELS
SIDE-DUMPING SCOOP

2,585,095

Filed Feb. 19, 1948

4 Sheets-Sheet 2

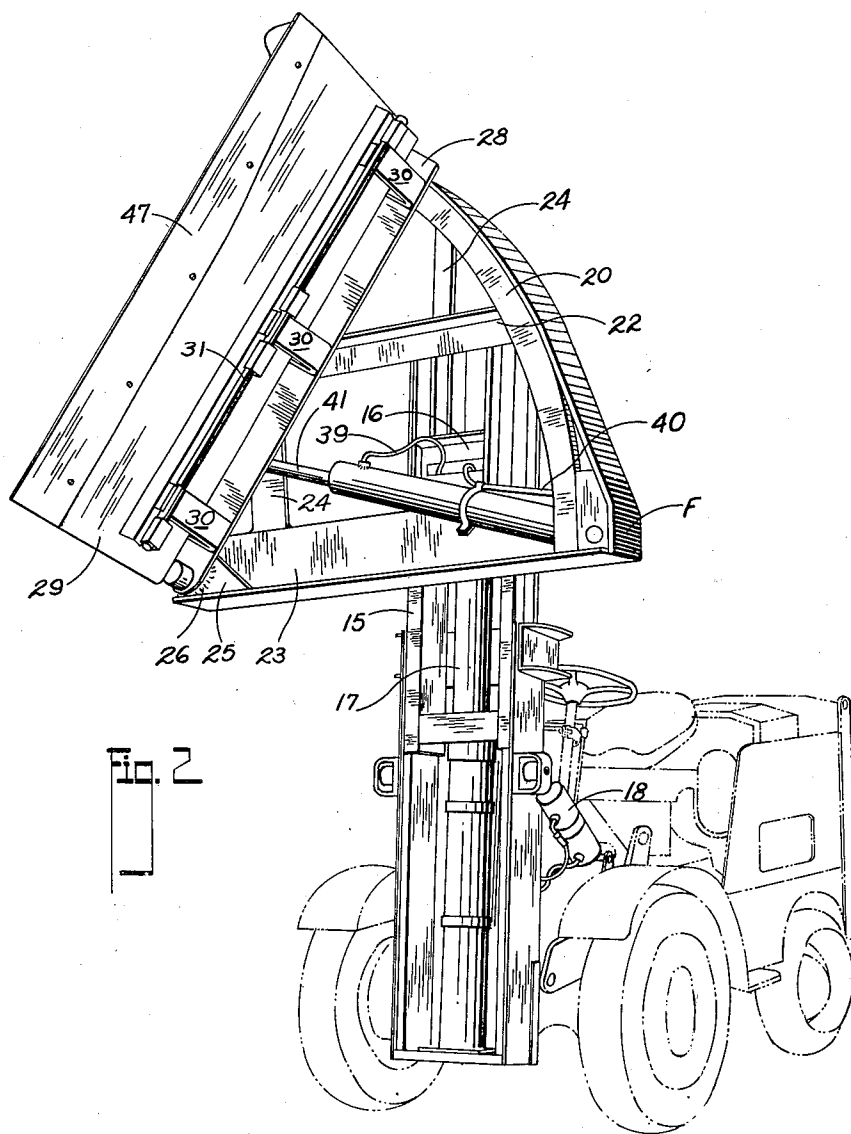


Fig. 2

INVENTOR.
LEE C. DANIELS

BY

Reich & Watts
ATTORNEYS

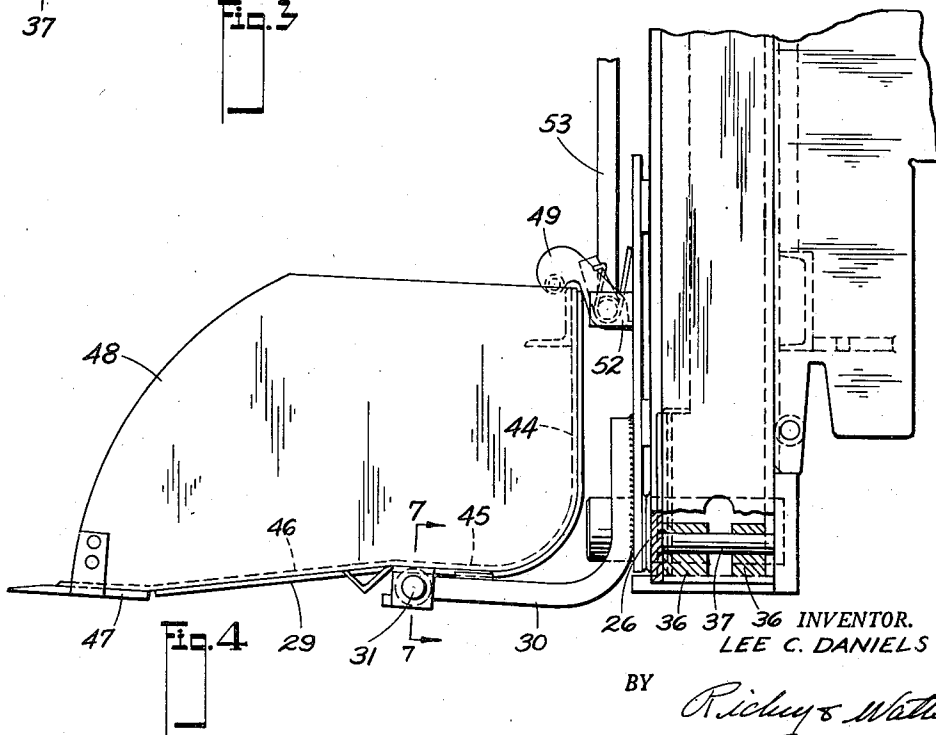
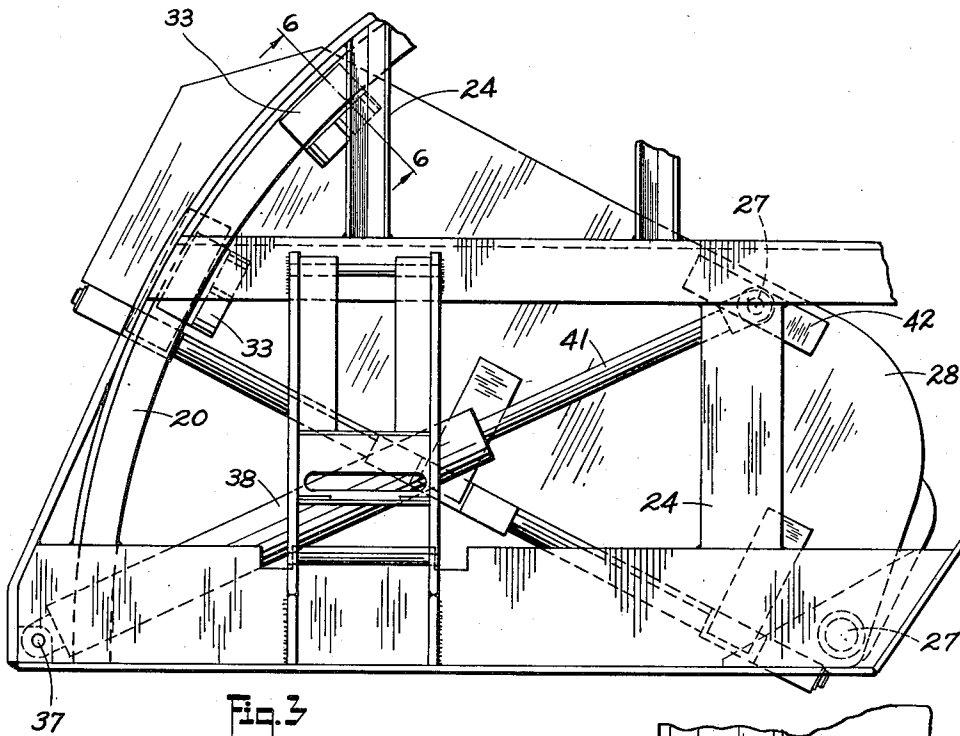
Feb. 12, 1952

L. C. DANIELS
SIDE-DUMPING SCOOP

2,585,095

Filed Feb. 19, 1948

4 Sheets-Sheet 3



INVENTOR.
LEE C. DANIELS

BY

Richy & Watts
ATTORNEYS

Feb. 12, 1952

L. C. DANIELS
SIDE-DUMPING SCOOP

2,585,095

Filed Feb. 19, 1948

4 Sheets-Sheet 4

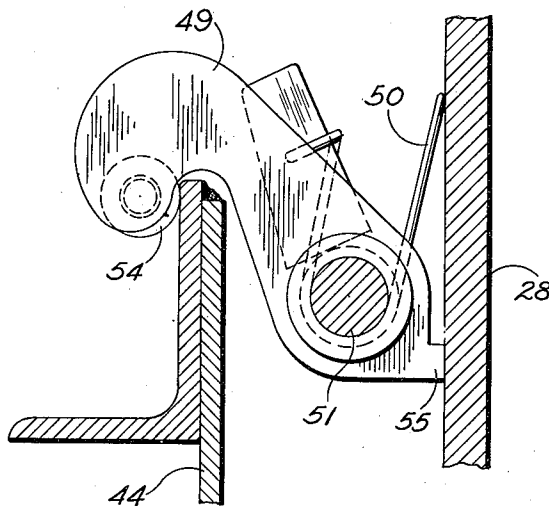


Fig. 5

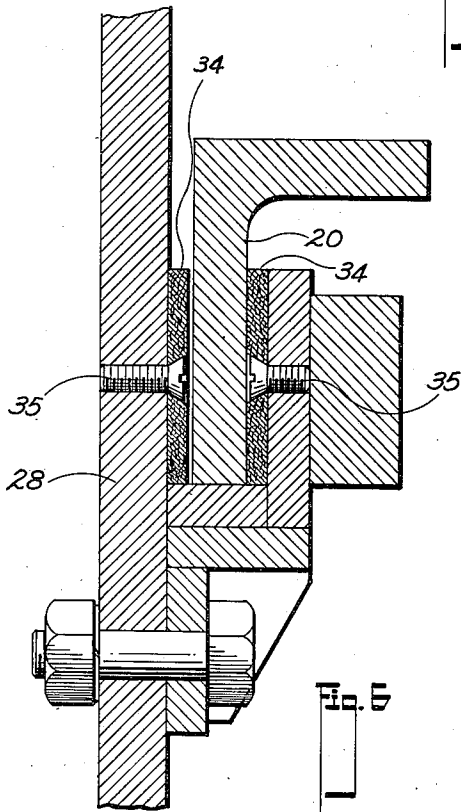


Fig. 6

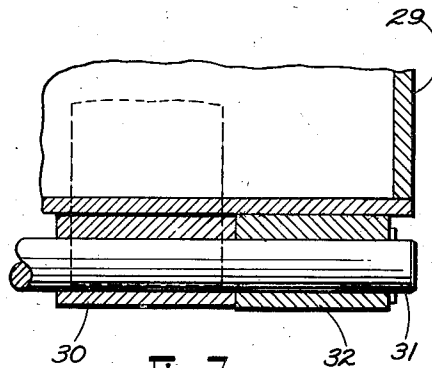


Fig. 7

INVENTOR.
LEE C. DANIELS
BY *Richy & Watts.*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,585,095

SIDE-DUMPING SCOOP

Lee C. Daniels, Cleveland, Ohio, assignor to Towmotor Corporation, Cleveland, Ohio, a corporation of Ohio

Application February 19, 1948, Serial No. 9,388

10 Claims. (Cl. 214—121)

1

This invention relates broadly to material-handling machines, and, more specifically, to self-propelled vehicular scoops for the removal of comminuted material from the corners of excavations, storage bins, and similar enclosures.

Illustrative of one of the environs within which the improved machine may be used is a collier which has been partially unloaded by a clam shell or similar grab-bucket, but still contains deposits in the corner edges of the hold. Heretofore it has been the practice to employ manual labor to shovel such deposits from the sides of the hold to the center thereof or to areas within the operative range of the grab-bucket. Obviously such method of operation was slow, costly, and laborious, and in some instances hazardous. The present invention contemplates a self-propelled vehicle of a size that will accommodate the passage thereof through the hatch of a ship and of a weight that may be readily handled by a crane of the type normally used in or about the ship or wharf. The invention further contemplates a scoop which is designed for the removal of material lodged between a vertical wall and the floor of a chamber, a scoop which may be loaded by the forward translation of the vehicle, a dumping mechanism which is designed to facilitate the discharge of the material at one side of the vehicle, and a scoop-elevating mechanism which may be inclined rearwardly to maintain the load when the vehicle is in motion or inclined forwardly to facilitate the entry of the material into the scoop.

In addition to the foregoing objects and advantages, the invention further comprehends an improved power-operated material-handling mechanism which is efficient of operation, sturdy of structure, economic of manufacture, and operable with a minimum expenditure of effort on the part of the machine operator.

Other objects and advantages more or less ancillary to the foregoing, and the manner in which all the various objects are realized, will appear in the following description, which, considered in connection with the accompanying drawings, sets forth the preferred embodiment of the invention.

Referring to the drawings:

Fig. 1 is a view in perspective of an industrial truck embodying the improved scoop and dumping mechanism therefor;

Fig. 2 is a similar view in perspective illustrating the scoop in an actuated position;

Fig. 3 is a rear elevational view of the scoop and associated parts;

2

Fig. 4 is a side elevational view thereof;

Fig. 5 is an enlarged side elevational view of the latch with the parts associated therewith shown in section;

Fig. 6 is a transverse sectional view through the scoop guide rail, the section being taken on a plane indicated by the line 6—6 in Fig. 3; and

Fig. 7 is a vertical sectional view of the scoop hinge, the section being taken on a plane indicated by the line 7—7 in Fig. 4.

Referring first to Fig. 1, the lift truck chosen herein for purpose of illustration comprises generally a combined frame and body 10 mounted on wheels 11, a steering gear 12 therefor, and an engine 13 which is operatively connected, in the customary manner, with the drive wheels and a hydraulic pump (not shown). The pump is coupled with a fluid circulatory system having a valve unit 14 therein which controls the motive fluid delivered to the cylinders that implement the lift carriage and certain other elements of the machine. The forward end of the truck is provided with a mast 15 having a slide or carriage 16 (Fig. 2) thereon which is reciprocated by a piston cylinder assembly 17. The mast is pivoted adjacent its lower end to the frame of the vehicle and is adapted for forward and rearward inclination by hydraulic jacks 18.

The carriage 16 supports a frame F embodying an arcuate track 20, an angular side member 21, cross rails 22 and 23, and spaced vertical struts 24. The lower inner corner of the frame is reinforced with a gusset plate 25 having a bearing boss 26 thereon which is bored for the reception of a pin 27 constituting the fulcrum for a plate 28 that forms the supporting element for the scoop 29. The outer face of the plate 28 is provided with a pair of forwardly disposed arms 30 having the free ends thereof drilled to receive a hinge pin 31 which is journaled in bearing blocks 32 mounted on the lower face of the scoop.

As illustrated in Fig. 3, the rearward face of the plate 28 is provided with a pair of guide shoes 33 constructed from an organization of plates welded to form channels disposed to encompass the depending flange of the angle iron track 20. The inner faces of the channels are provided with wear plates 34 preferably retained by machine screws 35 to facilitate the ready renewal thereof. The lower outer corner of the frame F is formed with a pair of opposed bosses 36 having a cross pin 37 therein for the pivotal support of a cylinder 38 operatively connected

3

to the hydraulic system by conduits 39 and 40. The cylinder supports a piston 41 which is swiveled in a bracket 42 mounted on the plate 28 to effect the rotative movement thereof about its fulcrum 27 during operation of the piston. The conduits 39 and 40 are in fluid communication with the valve unit 14 so that operation of the side-dumping cylinder 38 may be controlled from the driver's seat.

The scoop is constructed from a plate 43 bent throughout its length to form a vertical rear wall 44, a substantially horizontal base 45, and a forwardly inclined intermediate section 46. The leading edge of the scoop is preferably provided with a removable wear plate 47 having a beveled surface in the forward upper face thereof. The portion of the scoop adjacent the track 20 is formed with an end wall 48 substantially equal in length to the rear wall 44 and of complementary configuration to the upper face of the base 45. The plate 28 is provided with a pair of latch arms 49 normally engaged with the upper edge of the rear wall 44 of the scoop by a contractile spring 50. The arms are keyed upon a shaft 51 journaled in brackets 52 on the plate 28 and may be released by actuation of a lever 53 affixed to the outer end of the shaft 51. The free end of the latch arms are preferably provided with rollers 54 to relieve the frictional resistance initiated during the retractive movement thereof and may be formed with lugs 55 disposed for abutting engagement with the plate 28 to delimit the movement of the upper ends thereof.

When the vehicular scoop is used in the hold of a ship, a pit, or similar environs, it may be lowered therein by a crane, then driven forwardly with the scoop lowered and the end wall 48 thereof in contiguous relation to a vertical side wall of the chamber. When the scoop is filled the operator may manipulate the hydraulic control valve 14 to admit motive fluid into the cylinder 38 and thus effect the distention of the piston 41 and the consequent rotative dumping movement of the scoop about its fulcrum 27. Following this routine the operator may traverse the boundaries of the chamber, moving the material gathered by the scoop from the corners between the wall and the floor to areas operatively available to a clam shell bucket or similar excavating machine. If the operation warrants, the scoop may be elevated before dumping, in which case the operator may actuate the requisite arm in the control valve unit 14 to lift the carriage upon which the scoop is mounted, then manipulate the valve for the cylinder 38 as in the former case. When necessary or desirable, the load may be transported from one portion of the chamber to another in which case the mast 15 may be inclined rearwardly to assure the retention of the load within the scoop. In this operation the valve in the control unit 14 for the hydraulic jack 18 may be adjusted to retract the piston and thus effect sufficient inclination of the mast to prevent the material in the scoop from spilling from the forward end thereof. In addition to the foregoing, the material in the scoop may be deposited in an open container such as a dump truck body, bucket, or like apparatus, by first moving the truck to fill the scoop, elevating the carriage to the requisite height to accommodate the dumping operation, then rotating the scoop to the discharge of the material from the side thereof as illustrated in Fig. 2, or operating the lever 53 to effect the release of the latch arms

4

43 and the consequent discharge of the material through the forward end of the scoop.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. A dump scoop for an industrial lift truck embodying a mast having a reciprocative carriage thereon, mechanism for dumping said scoop comprising a frame mounted on said carriage, a scoop pivoted at one end thereof for side-dumping and pivoted parallel the plane of the carriage for front-dumping, a latch for the retention of the scoop in its operative position, and a hydraulic jack intermediate the frame and scoop for actuating the scoop in side-dumping positions.

2. A machine for moving material from the corners defined by a side wall and the floor of a chamber, comprising a small self-propelled vehicle of a character that may be readily lifted and lowered into the chamber, a hydraulic pump on said vehicle, a mast on the vehicle, a reciprocative carriage thereon, a hydraulic jack for the carriage coupled with said pump, a scoop having an open end therein pivoted to the carriage adjacent its open end, an arcuate track on said carriage, guides on the carriage engaged with the track, a hydraulic jack intermediate the scoop and the carriage for lifting the free end of the scoop, fluid connections between said pump and the last-named jack, and valve means for the control of said jacks.

3. A vehicular scoop comprising a plate bent along its major axis at right angles, a wall in one end thereof, a frame for the support of the scoop upon a vehicle, a pivot pin in the vertical wall of the scoop opposite the side having the end wall therein, a hinge on the bottom wall of the scoop coupled with said frame, a latch therefor, means for releasing the latch for front-dumping, and a hydraulic jack intermediate the scoop and the frame for side-dumping operation of the scoop.

4. In combination, a self-propelled dirigible vehicle with an axis of forward and rearward movement, a carriage at one end of the vehicle, means for raising and lowering the carriage, means on the carriage defining a pivot generally parallel to the vehicle axis, a frame mounted on and rotatable about the pivot, power means coupled between the carriage and frame for effecting the said rotation, and a scoop open at the front and one side mounted on the frame for rotation about a pivot generally perpendicular to the first-named pivot, so that the frame may be rotated about the first-named pivot for side dumping from the scoop, and the scoop may be rotated about the second-named pivot for front dumping.

5. A dumping scoop mechanism for a lift truck comprising a carriage reciprocable on the mast of a lift truck, a frame on the carriage rotatable about an axis generally parallel to the front-to-rear axis of the truck, a motor for rotating the frame, a track on the carriage for guiding the frame at the side opposite the axis of rotation, and a scoop having a bottom, a rear wall adjacent the frame, and one side wall, and open at the front and the other side, the scoop being mounted on the frame for rotation therewith.

5

6. A dumping scoop mechanism for a lift truck comprising a carriage reciprocable on the mast of a lift truck, a frame on the carriage rotatable about an axis generally parallel to the front-to-rear axis of the truck, a motor for rotating the frame, a scoop having a bottom, a rear wall adjacent the frame, and one side wall, and open at the front and the other side, the scoop being mounted on the frame for rotation therewith, a pivotal connection between the scoop and frame for dumping movement of the scoop about an axis substantially perpendicular to the frame pivot, and means for holding the scoop against front-dumping movement.

7. In combination with an industrial truck embodying a mast having a reciprocating carriage thereon, a scoop on said carriage comprising a bottom, rear, and one side wall, a hinge on the bottom of the scoop normal to the medial axis of the truck to accommodate forward dumping, a pivot pin for said scoop parallel the axis of the truck and adjacent the lower inner corner of the open side thereof to accommodate side dumping, an arcuate track for guiding the free side of the scoop during side dumping operations, the radius of the track being struck from said pivot pin, and a hydraulic jack operatively connected to the scoop above said pivot pin and to the carriage at a point adjacent the lower inner corner of the side wall of the scoop.

8. A machine for moving material from the corners defined by a side wall and the floor of a chamber, comprising a small self-propelled vehicle of a character that may be readily lifted and lowered into the chamber, a hydraulic pump on said vehicle, a mast in the vehicle, a reciprocative carriage thereon, a hydraulic jack for the carriage coupled with said pump, a scoop having an open end and one open side pivoted adjacent its open side to the carriage, and a second hydraulic jack connected to the scoop and mounted on the carriage for rotating the scoop in a plane normal to the medial axis of the vehicle.

9. A machine for moving material from the corners defined by a side wall and the floor of a chamber, comprising a small self-propelled vehicle of a character that may be readily lifted and lowered into the chamber, a hydraulic pump on said vehicle, a mast on the vehicle, a reciprocative

6

carriage thereon, a hydraulic jack for the carriage coupled with said pump, a scoop comprising a side wall, a back wall, and a bottom wall, a plate on the carriage, a hinge thereon connected to the bottom of the scoop for forward dumping, a pivot pin in said plate adjacent the open side of the scoop and in said carriage, and a second jack mounted on the carriage and attached to the plate remote said pivot pin for actuating the scoop into side dumping position.

10. In combination with a self-propelled vehicle having a vertical reciprocative carriage on one end thereof, a plate pivoted on said carriage for rotative movement in a plane normal to the medial axis of the vehicle, a scoop hinged upon said plate for vertical movement of the forward end thereof, said scoop comprising a bottom, back, and side wall, said side wall being disposed in opposition to the pivot on said plate, a latch on said plate for the support of the scoop with the bottom thereof in a horizontal plane, and a hydraulic jack supported by the carriage and operatively connected to said plate superjacent the pivotal connection therefor.

LEE C. DANIELS.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,571,360	Williams	Feb. 2, 1926
2,110,737	Palmer	Mar. 8, 1938
2,148,359	Le Bleu	Feb. 21, 1939
2,212,711	MacIsaac	Aug. 27, 1940
2,319,456	Hazen	May 18, 1943
2,405,893	Leftwich	Aug. 13, 1946
2,411,228	Poulsen	Nov. 19, 1946
2,413,661	Stokes	Dec. 31, 1946
2,427,301	Puim	Sept. 9, 1947
2,437,010	Way	Mar. 2, 1948
2,457,366	Guerin	Dec. 28, 1948
2,516,686	Druschel	July 25, 1950

FOREIGN PATENTS

Number	Country	Date
671,115	France	1929