Oct. 14, 1958 D. B. WEAVER 2,856,223

BOTTOM DISCHARGE BUCKET

Filed March 30, 1955

FIG_1_

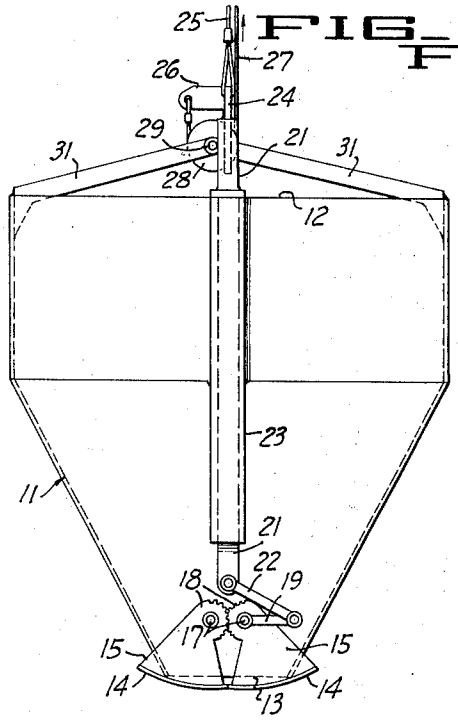


FIG_2_

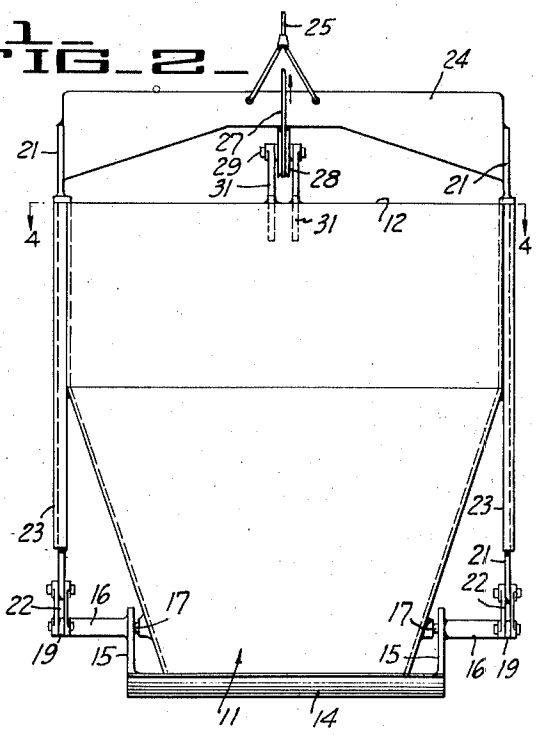


FIG_3_

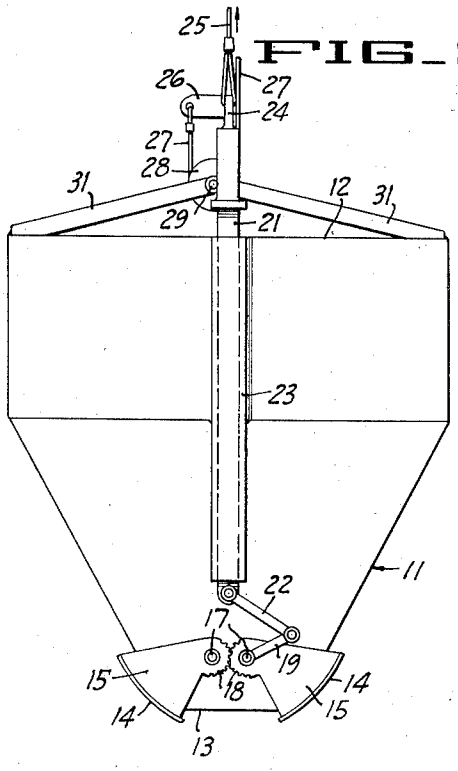
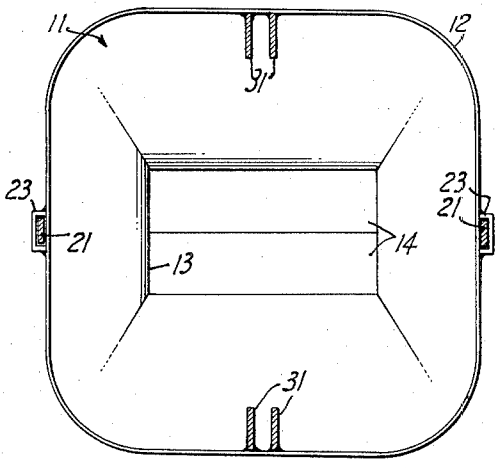


FIG_4_



INVENTOR.
Donald B. Weaver
BY Fishburn & Swain
ATTORNEYS

United States Patent Office

2,856,223

Patented Oct. 14, 1958

2,856,223

BOTTOM DISCHARGE BUCKET

Donald B. Weaver, Berkeley, Calif., assignor to Ben C. Gerwick, Inc. and Peter Kiewit Sons' Co., San Francisco, Calif., a joint venture comprising Ben C. Gerwick, Inc., a corporation of California, and Peter Kiewit Sons' Co., a corporation of Nebraska

Application March 30, 1955, Serial No. 497,968

2 Claims. (Cl. 294—71)

This invention relates generally to buckets such as are used for handling wet concrete mixes.

Conventional concrete buckets such as are used for transporting and discharging batches of concrete, employ gates movable for a dumping or discharging operation. Manually operated means for moving the gates is generally unsatisfactory because it requires the presence of an attendant near the bucket, and because of the manual effort required. Remote control operators, such as pneumatic or hydraulic pistons, have been used with some success to avoid manual operation, but they have required the use of objectionable fluid connections to the point of control, and in many instances have not permitted proper control over the discharge operation.

In general, it is an object of the present invention to provide a concrete bucket having an improved discharge means which avoids objectionable features of conventional buckets.

Another object of the invention is to provide a concrete bucket having novel means for operating the dumping gates which permits remote control without objectionable hydraulic or pneumatic connections.

Another object of the invention is to provide a concrete bucket which is operated entirely by means of hoist lines.

Further objects and features of the invention will appear from the following description in which the preferred embodiment of the invention has been described in detail in conjunction with the accompanying drawing.

Referring to the drawing:

Figure 1 is a side elevational view of a concrete bucket embodying the present invention, with the gates shown in closed position.

Figure 2 is a front elevational view of the concrete bucket shown in Figure 1.

Figure 3 is a side elevational view similar to the side elevational view of Figure 1 but showing the gates in open position.

Figure 4 is a cross-sectional view taken along line 4—4 of Figure 2.

The device illustrated in the drawing consists of a bucket **11** having an upper open end **12** to receive material from batching equipment, and a lower open end **13** for the discharge of the material. The lower end is provided with a pair of gates **14**, which are mounted for movements in opposite directions between open and closed positions. Preferably, each gate is formed with a curvature corresponding generally to a segment of a cylinder, or, in other words, the gates are clam shell-shaped.

Arms **15** are attached to the ends of the gates, and these arms in turn are fixed to the hollow shafts **16**. The shafts **16** are journaled upon fixed stud shafts **17** which are suitably mounted upon the sides of the bucket. Gear segments **18** are formed on the arms and engage between the centers of the shafts **16**, as shown in Figures 1 and 3, whereby the gates are caused to move in unison between closed and open positions.

At each side of the bucket, an operating arm **19** is attached to one of the shafts **16**. These arms are operatively attached to the lower ends of the reciprocating pull bars **21**, by the links **22**. The pull bars are slidably housed within guideways **23** that are attached to the sides of the bucket.

At the upper end of the bucket the bars **21** are interconnected by a yoke-like member or beam **24**, which is adapted for connection with the hoist line **25**. A dead-end member **26** is mounted on the yoke member **24** (Figure 1), and is adapted to be connected to the main hoist line **27**. The direction of pull of the main hoist line **27** is reversed by a pulley **28**. This pulley is carried by the main part of the bucket and is shown journaled upon a shaft **29**, which in turn is carried by the structural steel members **31** that are attached at their outer ends to the side walls of the bucket.

Operation of the device may now be briefly described as follows: Let it be assumed that hoist lines **25** and **27** are connected to a suitable derrick or crane in which each of the hoist lines are wound upon separate drums which can be independently operated.

When gates **14** are in closed position, as shown in Figure 1, the weight of the concrete bucket **11** is carried by main hoist line **27**, and the bucket can be filled with concrete mix and hoisted and moved to any position desired merely by continuing to carry the weight of the bucket **11** on hoist line **27**.

When it is desired to dump or empty the concrete mix from bucket **11**, gates **14** are opened by shifting the weight of bucket **11** from line **27** to line **25** as by operating the hoist drum for line **25** until the weight of the bucket is carried by line **25**.

Shifting the weight of bucket **11** to line **25** causes upward movement of yoke-like member **24** and pull bars **22**. Upward movement of pull bars **21** opens gates **14** by movement of operating arms **19** to the position shown in Figure 3.

When it is desired to close gates **14**, it is merely necessary to shift the weight of the bucket to line **27** which causes downward movement of yoke-like member **24** to bring the operating arms **19** to the position shown in Figure 1. Pulley **28** reverses the direction of pull of line **27** and causes downward movement of yoke-like member **24** even though the concrete bucket **11** is being lifted by line **27**.

It is apparent from the foregoing that I have provided a new and improved bucket for transporting and discharging batches of concrete mix in that simplified control means have been provided for opening and closing the gates on the bucket. By using two hoist lines to operate the concrete bucket, the entire bucket operation can be controlled by one operator on the crane, derrick, or other hoisting and transport means employed. No air hose fittings or the like need be attached to the bucket for operation of the gates. The bucket is particularly adapted for use underwater where air controls and hoses would be difficult to maintain.

I claim:

1. In a bucket apparatus, a bucket having an opening for receiving material and a lower discharge opening, gate means mounted on the lower portion of said bucket and movable between open and closed positions with respect to the discharge opening, gate operating means mounted on said bucket and connected to the gate means whereby upon movement of said gate operating means in an upward direction said gate means is moved towards an open position and upon movement of gate operating means in a downward direction said gate means is moved towards a closed position, first and second hoist lines connected to said gate operating means, and means mounted on said bucket for reversing the direction of pull of said second

hoist line on said gate operating means whereby when the weight of the bucket is shifted between said hoist lines, said gate means is positively moved between open and closed positions.

2. In a bucket apparatus, a bucket having an opening for receiving material and a lower discharge opening, gate means pivotally mounted on the lower portion of the bucket and movable between open and closed positions with respect to the discharge opening, a beam extending across the upper end of the bucket, pull bars slidably mounted on opposite sides of said bucket and having their upper ends connected to said beam, lever means connecting the lower end of said pull bars to said gate means whereby upon downward movement of said beam and the pull bars connected thereto said gate means is positively moved towards a closed position and upon upward movement of the beam and the pull bars attached thereto the gate means is positively moved towards an open position,

first and second hoist lines secured to said beam for carrying said bucket, a pulley mounted on the upper end of said bucket below said beam, said second hoist line being reeved about said pulley to reverse the direction of pull of said second hoist line on said beam from the direction of pull by the first hoist line upon said beam whereby as the weight of the bucket is shifted between the first and second hoist lines, said gate means is positively moved between open and closed positions.

References Cited in the file of this patent

UNITED STATES PATENTS

424,989	Ludlow et al.	Apr. 18, 1890
512,827	Hunt	Jan. 16, 1894
812,897	Niedermier	May 7, 1907
992,724	Lockwood	May 16, 1911
2,713,507	Garlinghouse	July 19, 1955