April 29, 1958 G. G. MORIN 2,832,631

CONCRETE POURING BUCKET.

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Fig. 1.

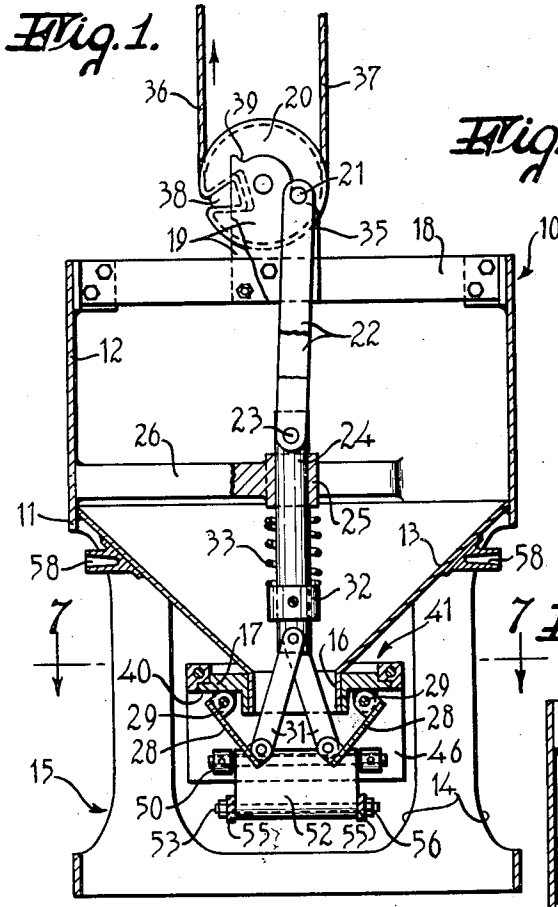


Fig. 3.

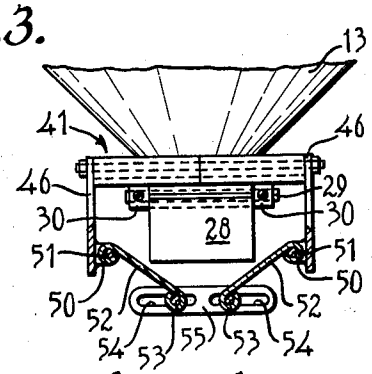


Fig. 4.

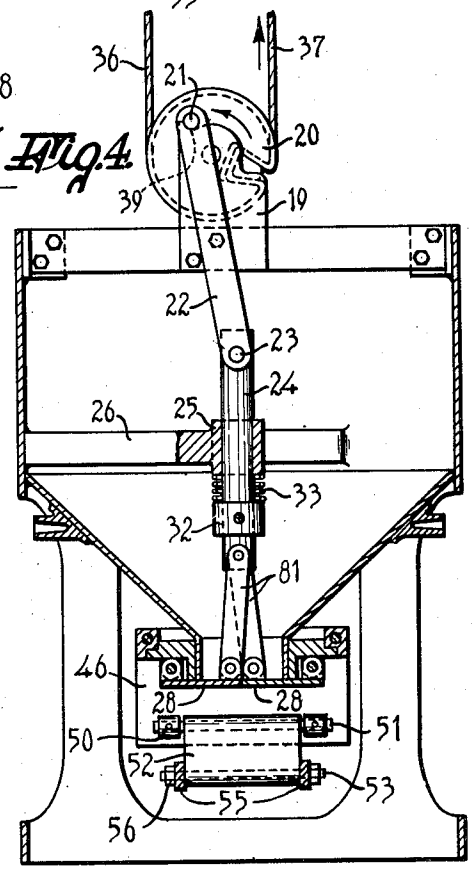
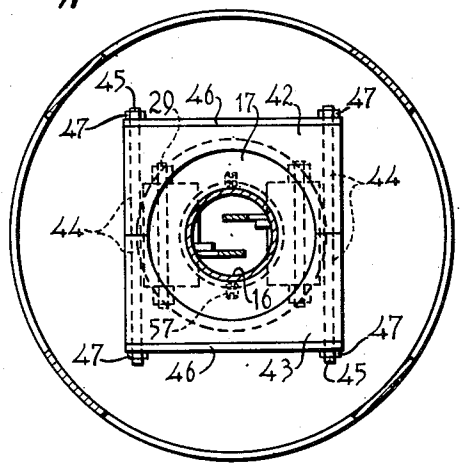


Fig. 2.



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Fig. 5.

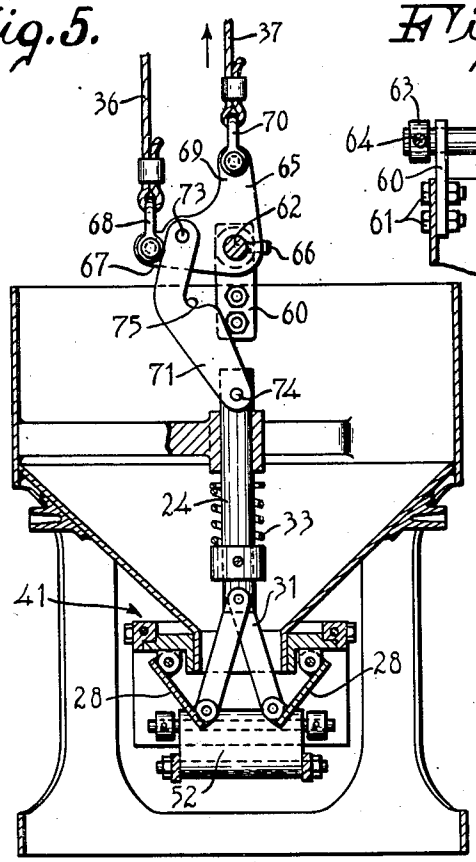


Fig. 6.

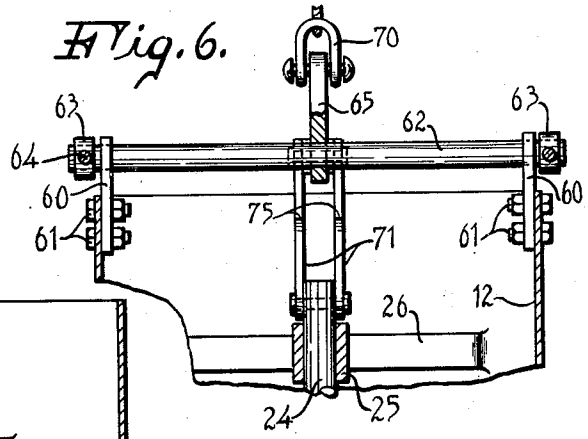


Fig. 8.

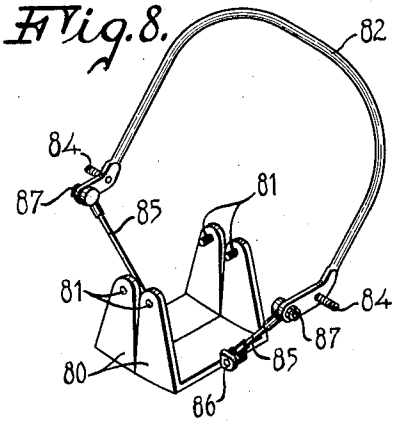


Fig. 7.

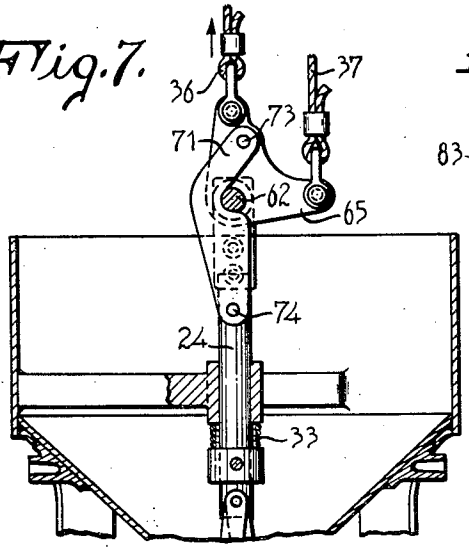
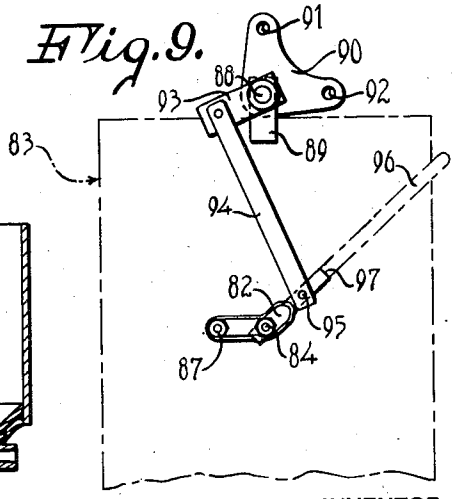


Fig. 9.



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CONCRETE POURING BUCKET

George G. Morin, West Springfield, Mass.

Application September 22, 1954, Serial No. 457,748

6 Claims. (Cl. 294—71)

This invention relates to an improvement in crane carried buckets for pouring concrete into forms.

One object of the invention is to provide a bucket which discharges downwardly, and which is power opened and closed.

A further object is to provide a bucket of the above character in which the parts are so arranged and adjusted that the positioning of the bucket for the discharge of its contents may be controlled by the crane operator without the assistance of workers at the point of discharge or at least with a minimum of such assistance.

This includes the provision of means by which the power for opening and closing the bucket is applied through the hoist lines and the quantity of material discharged from the bucket is completely under the control of the operator of the crane to the hoist lines of which the bucket is attached and also the provision of means which provides for a precise directional and lineally dispersive discharge of the concrete from the bucket.

With the buckets presently in use it is necessary to provide workers at the point of discharge of the bucket to orient the bucket to assure a proper directional discharge of the contents and to maintain its position and orientation during the discharge as well as to control the amount discharged in one location. The necessary presence of these workers requires the erection of staging or platforms adjacent the forms from which they can operate.

Other and further objects residing in the details of construction and operation will be made apparent from the disclosure of the accompanying drawings and the following specification and claims.

In the accompanying drawings,

Fig. 1 is an elevational view, parts being broken away and in section, of a pouring bucket embodying the invention, the parts being shown in bucket discharging position;

Fig. 2 is a sectional view substantially on line 2—2 of Fig. 1;

Fig. 3 is a detail view of the discharge spout of the bucket, looking from the right of Fig. 1, parts being shown in section;

Fig. 4 is a view similar to Fig. 1, but showing the parts in closed position;

Fig. 5 is a view similar to Fig. 1, but showing an alternative construction;

Fig. 6 is a detail view of the means connecting the bucket to the lift lines, looking from the right of Fig. 5, parts being shown in section;

Fig. 7 is a view similar to Fig. 5, but showing the parts in bucket closing position; and

Figs. 8 and 9 are diagrammatic views showing the manner in which the invention may be incorporated in one form of conventional bucket.

Referring to the drawings, the bucket, generally indicated at **10** is shown as comprising a cylindrical member **11**, the upper portion of which forms the side walls **12** of the bucket body and a conical member **13** having its upper periphery welded or otherwise secured adjacent

the lower edge of the side wall portion **12**. Below the portion **12** the cylindrical member **11** is cut away as at **14** to provide a frame structure, generally indicated at **15**. The conical member **13** terminates in a cylindrical spout **16** around which a flanged ring **17** is welded or otherwise secured. A transverse bar **18** is fixed across the upper end of member **11**. Bolted to member **18** are spaced upwardly directed sheave plates **19** between which a grooved wheel **20** is rotatably pivotally mounted. Wheel **20** carries a pin **21** extending beyond the side surfaces of the wheel and outwardly of sheave plates **19**. The outer ends of pins **21** are connected by links **22** to the ends of a pin **23** extending through the upper end of a rod **24**. Rod **24** is slidably mounted in a hub **25** of a spider **26**, the outer ends of the arms of the spider being welded or otherwise secured to the wall member **12**. A pair of valve members **28** are respectively hinged on rods **29** supported by lugs **30** (Fig. 3) fixed to the underside of flanged member **17**. The adjacent edge portions of valve members **28** are connected by respective links **31** to the lower end of rod **24**. Rod **24** is provided with a fixed collar **32**, and a spring **33**, surrounding rod **24**, is adapted to be compressed between collar **32** and hub **25** and act to force rod **24** downwardly under conditions later described.

In Fig. 1 the valve members **28** are shown swung downwardly away from the discharge end of spout **16** to open the bucket. When the parts are positioned as shown in Fig. 1 the ends of pin **21** engage shoulders **35** formed on the upper edge of sheave plates **19**. The crane lines or cables **36** and **37** of a lifting crane, not shown, are fixed in any suitable manner, as by key wedge **38**, to the periphery of the wheel **20**. Cranes of the type with which the bucket of this invention is adapted to be used are equipped with respective independent power driven drums, with brakes for each, about which the lines **36** and **37** are respectively wound. In the position shown in Fig. 1 equal tension on the lifting cables or, preferably, an excess of tension on cable **36**, as indicated by the arrow in the latter figure, maintains pin **21** against the shoulders **35** and the valve **28** in open position, permitting discharge of the bucket. To swing the valve members to the closed position of Fig. 4 it is only necessary to slacken cable **36** imposing an excess tension on cable **37**, as shown by the arrow in Fig. 4, to cause rotation of wheel **20** to position pin **21** in a seat **39** formed in the sheave plates **19**, thus lifting rod **24** and swinging the valve members **28** to the bucket closing position shown in Fig. 4. When pin **21** is in seat **39** links **22** have been carried past the center of wheel **20** and spring **33** is compressed between hub **25** and collar **32**, holding pin **21** on seat **39**, thus locking the bucket closed until an excess of tension is again imposed on cable **36** to overcome spring **33** and rotate pin **21** into engagement with shoulder **35** to re-open the bucket. The slight downward movement of pin **21** in effectively engaging in seat **39** is so slight that no objectionable opening of the valve members results.

Rotatably mounted on a shoulder or flange **40** formed on the outer periphery of flange member **17** is a supporting member, generally indicated at **41**, and, as best shown in Fig. 2, formed by two plates **42** and **43**. The adjacent edges of plates **42** and **43** are cut away to freely surround the spout **16** and adjacent lower portion of conical member **13**. The side edges of plates **42** and **43** are provided with aligned bores **44** through which extend rods **45**. The outer ends of rods **45** also extend through depending plates **46**, the plates **46** being held to the adjacent plates **43** and **44** and the latter held in an abutting position by nuts **47** threaded on the ends of rods **45**.

Each plate **46** carries adjacent its lower edge spaced lugs **50** supporting hinge pins **51** upon which are pivoted

opposed baffle plates 52 which, as more fully described in my copending application Serial No. 457,749 filed on even date herewith, simplifies construction of forms for walls and the like and avoids a substantial amount of hand manipulation in properly directing the discharge from the bucket. The lower edges of baffles 52 carry rods 53 which extend outwardly beyond the ends of the baffles and through slots 54 formed in strap members 55. The outer ends of rods 53 are threaded to receive nuts 56 by which the rods may be clamped in adjusted position in the slots 54 to vary the transverse width of the discharge opening between the baffles 52 and therefore the transverse thickness or width of the linear discharge of concrete from between the baffles.

As will be apparent the angular relation of the opening between the baffle plates to the axis of the opening through spout 16 may be adjusted by rotation of the supporting structure 41 on shoulder 40 of flange 17. The supporting structure 41 may be held in angularly adjusted position by one or more set screws as 57 engaging flange 67. The conical member 13 is provided with one or more sockets 58 for receiving a power driven vibrator to assure a free flow of the concrete and to maintain the walls of the bucket free of adhering concrete.

In Figs. 5, 6 and 7 an alternative form of bucket operating connection between the crane lift lines 36 and 37 and the bucket is shown. In the arrangement of the latter figures diametrically opposed brackets 60 are secured, as by bolts 61 or other suitable means, to the upper edge portion of wall member 12. A transverse shaft 62 is rotatably mounted at its ends in the brackets 60. Shaft 62 is held in this bracket by collars 63 secured thereto outwardly of the brackets by set screws 64. A bell crank member 65 is fixed to shaft 62 as by a set screw 66. One arm 67 of the bell crank is connected to line 36 by a clevis 68, the other arm 69 of the bell crank being connected to line 37 by a clevis 70.

A pair of links 71 are pivotally connected at one end to the bell crank 65, as by a pin 73, intermediate the end of arm 67 and shaft 62. The other end of links 71 are pivotally connected by a pin 74 to the upper end of rod 24 which operates the bucket valve, previously described. The links 71 are recessed at 75 so that pin 73 may pass over the center of shaft 62 and rod 24, when the weight of the bucket and its contents is transferred from line 37 to 36, causing bell crank 65 to rotate to the position of Fig. 7, to draw rod 24 upwardly and close the bucket valve. When the parts are in the position of Fig. 7, spring 33 is compressed as previously described and pin 73 having passed dead center the valve is held closed by the spring until the weight is again shifted to line 37 to swing the bell crank back to the position of Fig. 5. This arrangement has the advantage over that of Figs. 1 to 4 that the lifting force in both the open and closed position of the valve is along the vertical axis of the bucket.

In Fig. 8 is diagrammatically shown the closure valve of a conventional hand operated concrete pouring bucket, the valve comprising two U-shaped gate members 80 having pivot pins 81 by which the members 80 are pivoted to the spout, not shown, of the bucket. A U-shaped handle 82 is pivoted adjacent its ends to the bucket body, indicated at 83 in Fig. 9, by pivot bolts 84; and links 85 are connected at one end to members 80 by swivels 86 and pivotally connected at the other end to the ends of handle 82 as at 87. As will be obvious the application of downward pressure on handle 82 will open gate members 80 while upward pressure closes it.

The power opening and closing means of Fig. 5 may be substituted for the hand closing means just described in the manner shown in Fig. 9. As there shown a shaft 88 equivalent in structure and function to shaft 62 is mounted in brackets 89 welded to the upper rim of the bucket 83. A bell crank 90 similar to bell crank 65 is fixed to shaft 88 and is provided at the ends of its arms with openings 91 and 92 for attachment of lift lines such as 36 and 37 previously described. Lever arms 93 are secured to shaft 88 outwardly of brackets 89, the free end of each arm 93 being connected by respective links 94 to the adjacent arm of the handle 82 at points 95 on the opposite side of pivots 84 from the pivotal connections 87. If the conversion from manual to power operation is to be permanent the hand engaging portion 96 may be cut away as at 97. As will be apparent with the lifting load applied to bell crank 90 through a line connected at 91, in the position shown in Fig. 9, the gates 80 are held closed, but that shifting of the load to a line connected at 92 will rotate bellcrank 90 and, through links 94 depress the handle or the portions to which the links are connected to open the gates 80, as described, to discharge the contents of the bucket.

It will be apparent that the present invention provides means for supplying or transmitting power to buckets and similar crane lifted devices for actuation of the parts thereof and that while in the illustrative embodiments given such power is utilized to open and close the valve of a bucket it is not limited to such use, and for example, could be employed to effect directional rotation of the baffle support 41, vibrators and other auxiliary devices, and to provide remote control of the parts of any device carried by a plurality of independently powered hoist lines.

What is claimed is:

1. In a concrete pouring bucket having a discharge opening and valve means movable between open and closed position to control the flow of concrete through said opening, means to move said valve means to and from one of its said positions to the other, means for connecting the bucket to two lifting lines of a crane comprising a bell crank, a pivot shaft rotatably connecting the bell crank to the bucket body, means for connecting said lines one to each arm of the bell crank to rotate the bell crank when the major portion of the lifted weight is transferred from one line to the other, a link pivotally connected at one end to the valve moving means, the other end of the link being pivotally connected to one arm of the bell crank, said last-mentioned end of the link being bent to permit its connection to the bell crank to pass from one side to the other of the axis of said pivot shaft and move said valve moving means from valve opening to valve closing position upon rotation of the bell crank, and a spring holding said bent portion of the link against said pivot shaft as a stop to maintain the valve closed when both lines are slacked with the valve in closed position.

2. A concrete pouring bucket as in claim 1, the center of pivotal movement of the bell crank with respect to the bucket being positioned on the vertical axis of the bucket and the points of attachment of the lifting lines to the bell crank being so positioned that the point of attachment of that line on which the lifted weight is imposed is brought into the vertical axis of the bucket upon rotation of the bell crank in response to the imposition of the lifted weight on that line.

3. In a concrete pouring bucket having a discharge opening and valve means movable between open and closed positions, to control the flow of concrete through said opening, means to move said valve means from either of its said positions to the other, means for connecting the bucket to two lifting lines of a crane comprising a crank member, a pivot shaft rotatably connecting the crank member to the bucket body, means for connecting said lines respectively to said member at points spaced radially outwardly from the axis of said pivot shaft and located on radii making an angle with each other, a link, a first pivot pin pivotally connecting one end of the link to said valve moving means, a second pivot pin pivotally connecting the other end of the link to the crank member at a point spaced from the axis of said pivot shaft, said second pivot pin moving over the side of the pivot shaft remote from said first pivot pin from one side to the other

of the common plane in which the axes of the pivot shaft and the said first pivot pin lie to respectively open and close the valve when the major portion of the lifted weight is transferred from one line to the other, stop means defining the valve closing position of said second pivot pin, and a spring yieldingly holding said second pivot pin in its valve closing position when both lines are slacked with the valve closed.

4. A concrete pouring bucket as in claim 3 the center of pivotal movement of the crank member with respect to the bucket being positioned on the vertical axis of the bucket and the points of attachment of the lifting lines to the crank member being so positioned that the point of attachment of that line on which the lifted weight is imposed is brought into the vertical axis of the bucket upon rotation of the bell crank in response to the imposition of the lifted weight on that line.

5. A concrete pouring bucket as in claim 3, the said means for moving the valve means comprising a rod connected to said valve means and mounted in the bucket

body for reciprocable movement axially thereof to move the valve means from either of its said positions to the other.

6. A concrete pouring bucket as in claim 5 including a hub spaced from the valve member and through which said rod extends, a collar fixed to the rod intermediate said hub and the valve member, the spring yieldingly holding the second pivot pin in its valve closing position comprising a coiled spring surrounding said rod between said hub and said collar and of a length to be compressed therebetween to bias the second pivot pin toward stopped position when said second pivot pin is on the valve closing side of said plane.

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