

No. 754,431.

PATENTED MAR. 15, 1904.

J. M. CROWLEY.
PUMP.

APPLICATION FILED MAY 14, 1903.

NO MODEL.

Fig. 1.

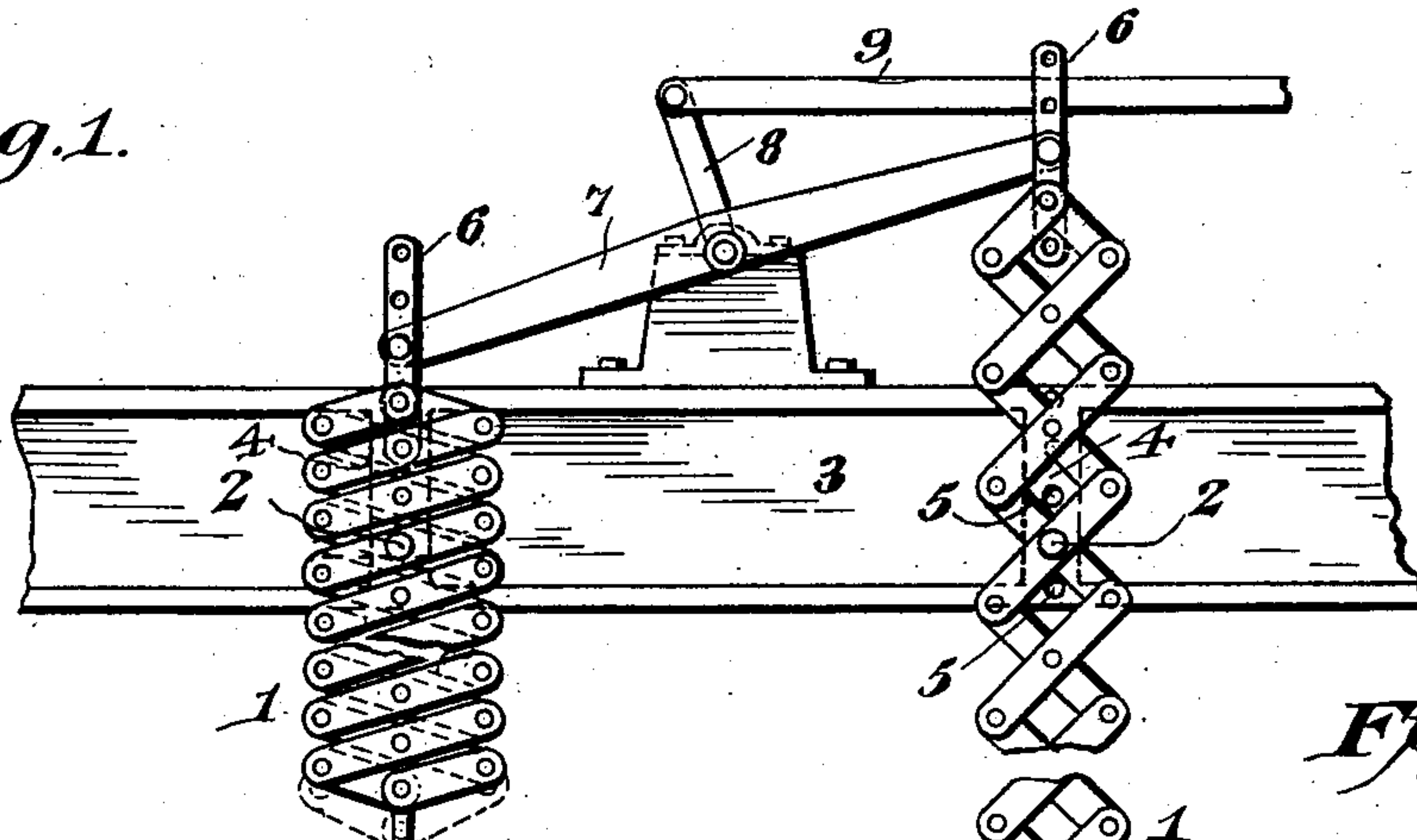


Fig. 3

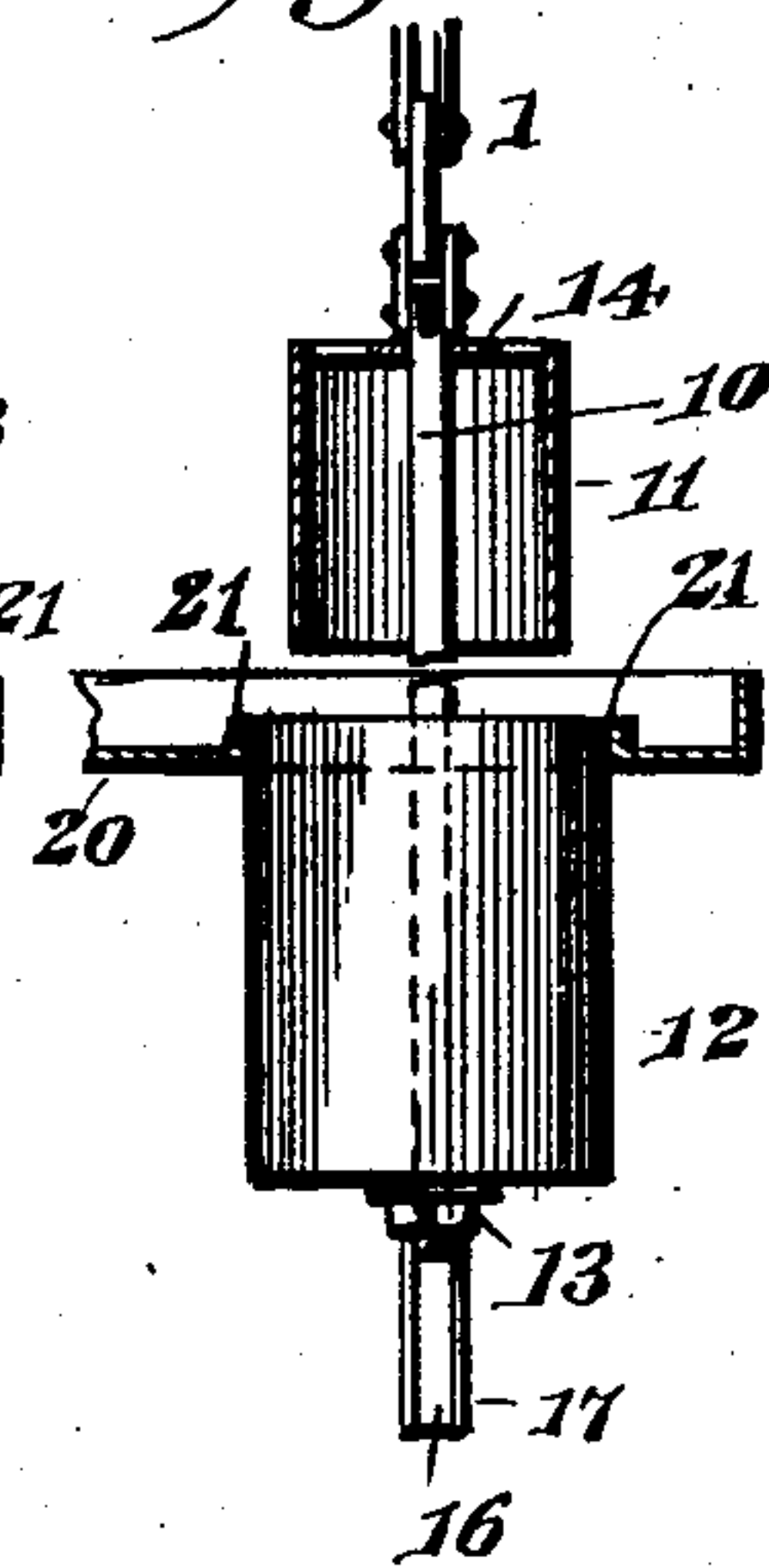


Fig. 2.

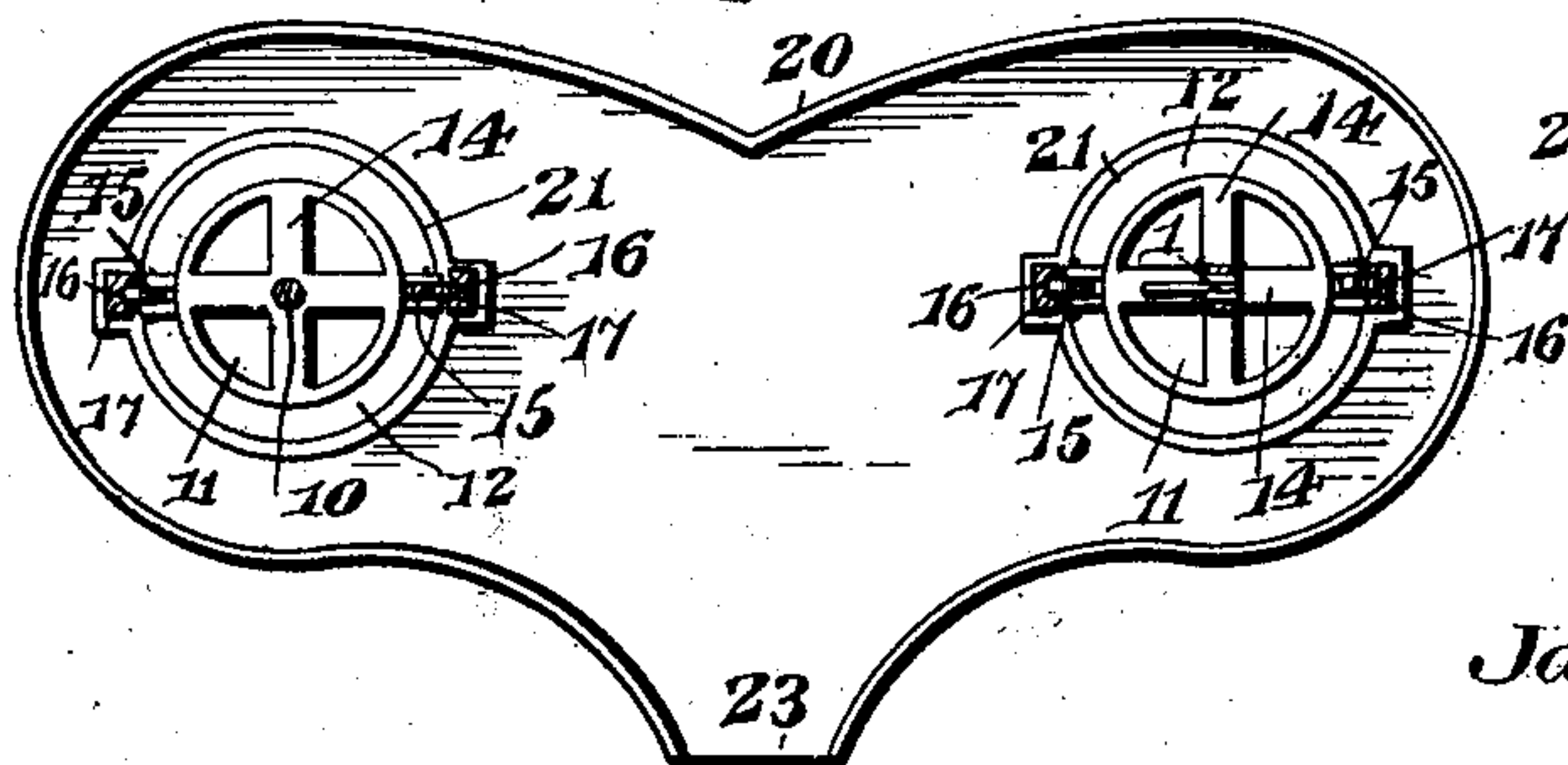
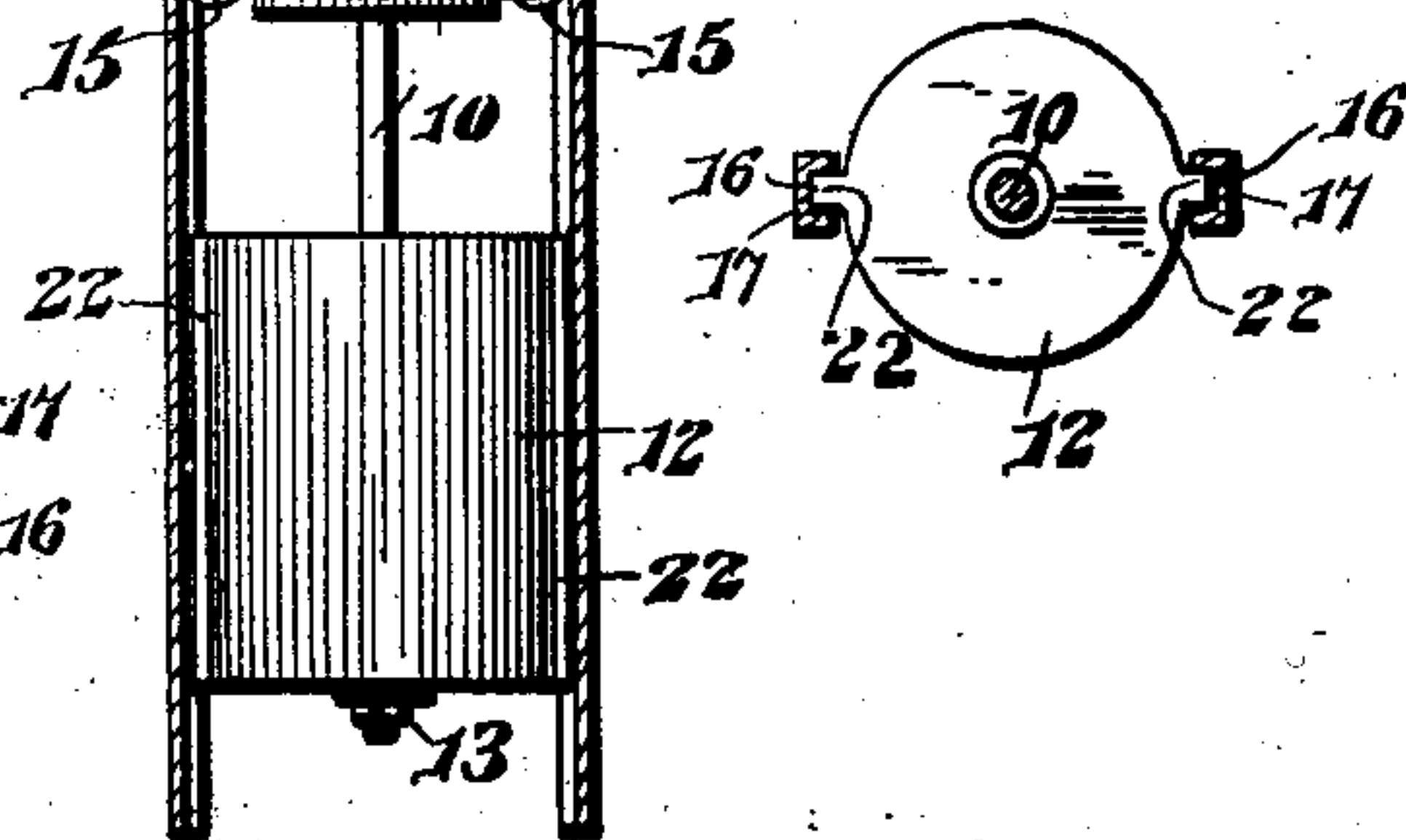


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PUMP.

SPECIFICATION forming part of Letters Patent No. 754,431, dated March 15, 1904.

Application filed May 14, 1903. Serial No. 157,145. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. CROWLEY, a citizen of the United States, residing at Carl Junction, in the county of Jasper and State of Missouri, have invented a new and useful Pump, of which the following is a specification.

The invention relates to improvements in pumps.

The object of the present invention is to improve the construction of pumps and to provide a simple and comparatively inexpensive balanced pump adapted with a short stroke to lift water a considerable distance, whereby it is adapted to be operated within a comparatively small space.

A further object of the invention is to provide a pump of this character in which it will be unnecessary to provide a column-pipe and which will lift water on the downstroke of the lever for actuating the water-elevating mechanism.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a vertical sectional view of a pump constructed in accordance with this invention. Fig. 2 is a horizontal sectional view of the same. Fig. 3 is a detail view illustrating the arrangement of the bucket and the valve for discharging the contents of the former. Fig. 4 is a detail view illustrating the construction of the valve.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 1 designate a pair of lazy-tongs pivoted intermediate of their ends by bolts 2 or other suitable fastening devices to a support 3, which may be constructed in any desired manner and which is provided with opposite upright por-

tions 4, having perforations 5 arranged at intervals and adapted to receive the pivots or fulcrums of the lazy-tongs, whereby the latter are adapted to be adjusted to vary their length and to obtain the desired length of stroke. The lazy-tongs are preferably formed of alternately-arranged single and double bars or links, the single bars or links being arranged between the members of the double bars or links; but any other desired arrangement may be employed for securing the necessary strength.

The upper ends of the lazy-tongs are pivoted to vertical bars or links 6, provided at intervals with perforations and adapted to afford an adjustable connection between a walking beam or lever 7 and the lazy-tongs. The walking beam or lever 7 is fulcrumed between its ends on the support 3, at the center of the top thereof, and is provided with an arm 8, which extends upward from the walking beam or lever 7, as clearly shown in Fig. 1 of the drawings. The arm 8 is connected by a rod or bar 9 with suitable operating mechanism, (not shown,) and when the walking beam or lever 7 is oscillated the lazy-tongs will be alternately expanded and contracted for a purpose hereinafter explained. The bars or links 6 permit the distance between the upper ends of the lazy-tongs and the fulcrum point or pivot 2 to be varied, and one or more sets of links may be removed, or the number of bars or members of the lazy-tongs frame may be increased. The size of the support 3 and the length of the links or bars 6 may be varied, as will be readily understood.

The lower ends of the lazy-tongs are connected with elongated valve stems or rods 10, which receive buckets 11 and valves 12. The valves, which preferably consist of cylindrical blocks, are secured to the lower portions of the rods by nuts 13 or other suitable means, and the buckets are capable of a limited movement on the valve rods or stems independent of the valves. The buckets, which are open at the top and bottom, are provided at their tops with spiders 14, having central openings to receive the valve rods or stems, and the lower ends of the buckets are closed on the up-

stroke by the valves, which are secured to the lower portions of the rods or stems.

Each bucket is provided at opposite sides with upper and lower antifriction rollers or wheels 15, arranged in pairs, as clearly shown in Fig. 1, and mounted between perforated lugs or ears, which project outward from the bucket at diametrically opposite points. The antifriction rollers or wheels are arranged in grooves 16 of vertical guides 17, which are provided at their upper ends with suitable seats 18, adapted to be engaged by the wheels of the bucket or receptacle for a purpose hereinafter explained. The vertical guide-bars, which are located at diametrically opposite points, extend downward from a trough 20 and project upward a short distance above the same. The trough is provided at opposite sides with openings 21 to receive the buckets and the valves, and it has upwardly-extending flanges surrounding the openings 21 to prevent any water from draining back into the well. The guide-bars 17 are located in recesses at opposite sides of the openings of the tank or trough, and the valves, which are preferably cylindrical, but which may be of any other desired configuration, entirely fill the openings when they are arranged as shown at the left-hand side of Fig. 1 of the drawings. On the upstroke the valve is carried upward against the lower end of the bucket or receptacle, thereby closing the same and confining the water within the bucket. The water is held in the bucket by the valve until the bucket arrives at the top of the guide-bars and engages the seats thereof. The bucket is thereby interlocked with the upper portions of the guide-bars, and when the lazy-tongs expand on the downstroke the bucket remains stationary until the lower end of the lazy-tongs engages it and forces it downward from the seat. The valve-stem 10 is of sufficient length to permit the valve to move away from the bucket and permit the water to escape into the trough 20. In practice the upper portions of the guide-bars will extend a sufficient distance above the trough 20, and the movement of the valve independent of the bucket will be ample to allow the contents of the bucket to discharge completely before the valve leaves the opening of the trough. The valve is increased in length, as illustrated in the accompanying drawings, in order to permit the necessary movement of the valve through the opening of the trough. The valves are provided at opposite sides with vertical ribs or flanges 22, which slide in the grooves of the guide-bar 17, and the upper portions of the latter are sufficiently resilient to enable the buckets to be readily engaged with and disengaged from the seats 19; but any other suitable means may be employed for retarding the buckets at the upper ends of the guide-bars to secure the operation of the apparatus. This structure besides open-

ing the buckets for discharging their contents also insures the opening of the buckets on the downward movement of the lazy-tongs to facilitate filling the buckets.

Any suitable means may be connected with the bar 9 for operating the pump, and when the walking beam or lever is oscillated the lazy-tongs will be reversely operated. One of the lazy-tongs will be extended and the other contracted at each stroke of the walking beam or lever.

The trough 20 is provided with a spout 23; but any other suitable means may be employed for conveying the water from the buckets to the points desired.

What I claim is—

1. In a pump, the combination with a receptacle having an open bottom, of a valve movable toward and from the bottom of the receptacle, mechanism for raising and lowering the valve and the receptacle, and means for holding the receptacle stationary during a portion of the downstroke of the valve, substantially as described.

2. In a pump, the combination with a receptacle having an open bottom, of a valve arranged to close the bottom of the receptacle, said receptacle being capable of a limited movement independent of the valve, operating mechanism for raising and lowering the receptacle and the valve, and means for holding the receptacle stationary during a portion of the downstroke of the valve, substantially as described.

3. In a pump, the combination of a receptacle having an open bottom, a valve arranged to close the open bottom of the receptacle on the upstroke and provided with a valve-stem receiving the receptacle, mechanism connected with the valve-stem for raising and lowering the same, and means for holding the receptacle stationary during a portion of the downstroke of the valve, substantially as described.

4. In a pump, the combination of a valve having a valve-stem, an open-bottom receptacle slidable on the valve-stem, lazy-tongs connected with the valve-stem, operating mechanism for actuating the lazy-tongs, and means for engaging the receptacle to hold the same stationary during a portion of the downstroke of the valve, substantially as described.

5. In a pump, the combination of an open-bottom receptacle, a valve for closing the bottom of the receptacle on the upstroke, mechanism connected with the valve for raising and lowering the same and the receptacle, and means for holding the receptacle during a portion of the downstroke of the valve, substantially as described.

6. In a pump, the combination of a valve having a valve-stem, an open-bottom receptacle slidable on the valve-stem, guides receiving the valve and the receptacle, operating mechanism connected with the valve-stem for

raising and lowering the same, and means for conveying water from the receptacle, substantially as described.

7. In a pump, the combination of upright 5 guide-bars, a receptacle provided with anti-friction rollers or wheels arranged on the guide-bars, said receptacle having an open bottom, a valve slidable on the guide-bars and provided with a stem receiving the receptacle, 10 mechanism connected with the stem for raising and lowering the same, and means for holding the receptacle during a portion of the downstroke, substantially as described.

8. In a pump, the combination of upright 15 guide-bars provided with grooves, a valve having a stem and provided with flanges fitting in the grooves, an open-bottom receptacle slidable on the stem and provided with anti-friction-wheels arranged in the grooves, mechanism 20 connected with the stem for raising and lowering the valve and the bucket, and means for holding the receptacle during a portion of the downstroke of the valve, substantially as described.

9. In a pump, the combination of upright 25 guides having seats, a valve slidable on the guides, an open-bottom receptacle loosely connected with the valve and provided with means for engaging the said seats, and means for 30 raising and lowering the valve, substantially as described.

10. In a pump, the combination of a trough or conduit having an opening, an open-bottom 35 receptacle, an elongated valve loosely connected with the receptacle and arranged to close the bottom thereof, said valve being also adapted to close the opening of the trough or conduit, and means for holding the receptacle 40 stationary during a portion of the downstroke of the valve, substantially as described.

11. In a pump, the combination of a pair of open-bottom receptacles, valves arranged to close the bottoms of the receptacles and provided with stems, lazy-tongs pivoted between

their ends and connected at their lower ends 45 with the valve-stems, and means connected with the upper ends of the lazy-tongs for operating the same, substantially as described.

12. In a pump, the combination of a support, lazy-tongs fulcrumed between their ends 50 on the support, a lever fulcrumed on the support and adjustably connected with the upper ends of the lazy-tongs, receptacles and valves connected with the lower ends of the lazy-tongs, the latter being capable of a limited 55 movement independent of the receptacles, and means for operating the lever, substantially as described.

13. In a pump, the combination of a support provided at opposite sides with vertical 60 series of perforations, lazy-tongs provided between their ends with fulcruming-pivots adapted to be arranged in the said perforations, a lever mounted on the support, links 65 provided with perforations and forming adjustable connections between the upper ends of the lazy-tongs and the lever, receptacles, valves, and means for connecting the valves 70 and the receptacles with the lower ends of the lazy-tongs, substantially as described.

14. In a pump, the combination of a support, a trough located beneath the support and having openings, upright guides extending 75 through the openings, lazy-tongs fulcrumed between their ends on the support, a lever connected with the upper ends of the lazy-tongs, receptacles slidable on the guides, and valves also slidable on the guides and connected with the lower ends of the lazy-tongs 80 and arranged to cover and uncover the receptacles, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES M. CROWLEY.

Witnesses:

C. F. SMITH,
ANNA YTELL.