

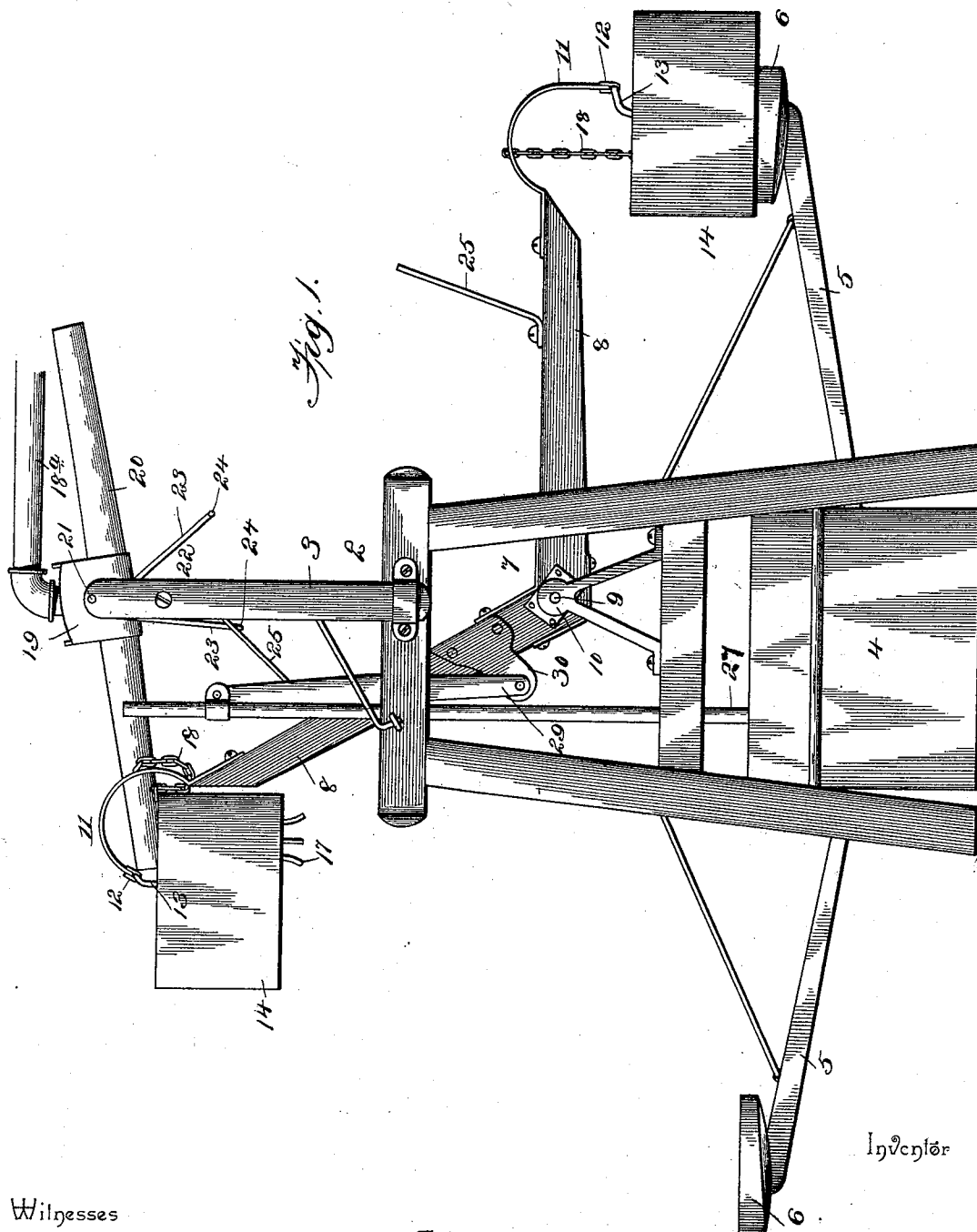
(No Model.)

R. C. WATKINS.
WATER MOTOR.

3 Sheets—Sheet 1.

No. 510,826.

Patented Dec. 12, 1893.



Inventor

Witnesses

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W. E. Dwyer

By *W. E. Dwyer*, Attorneys.

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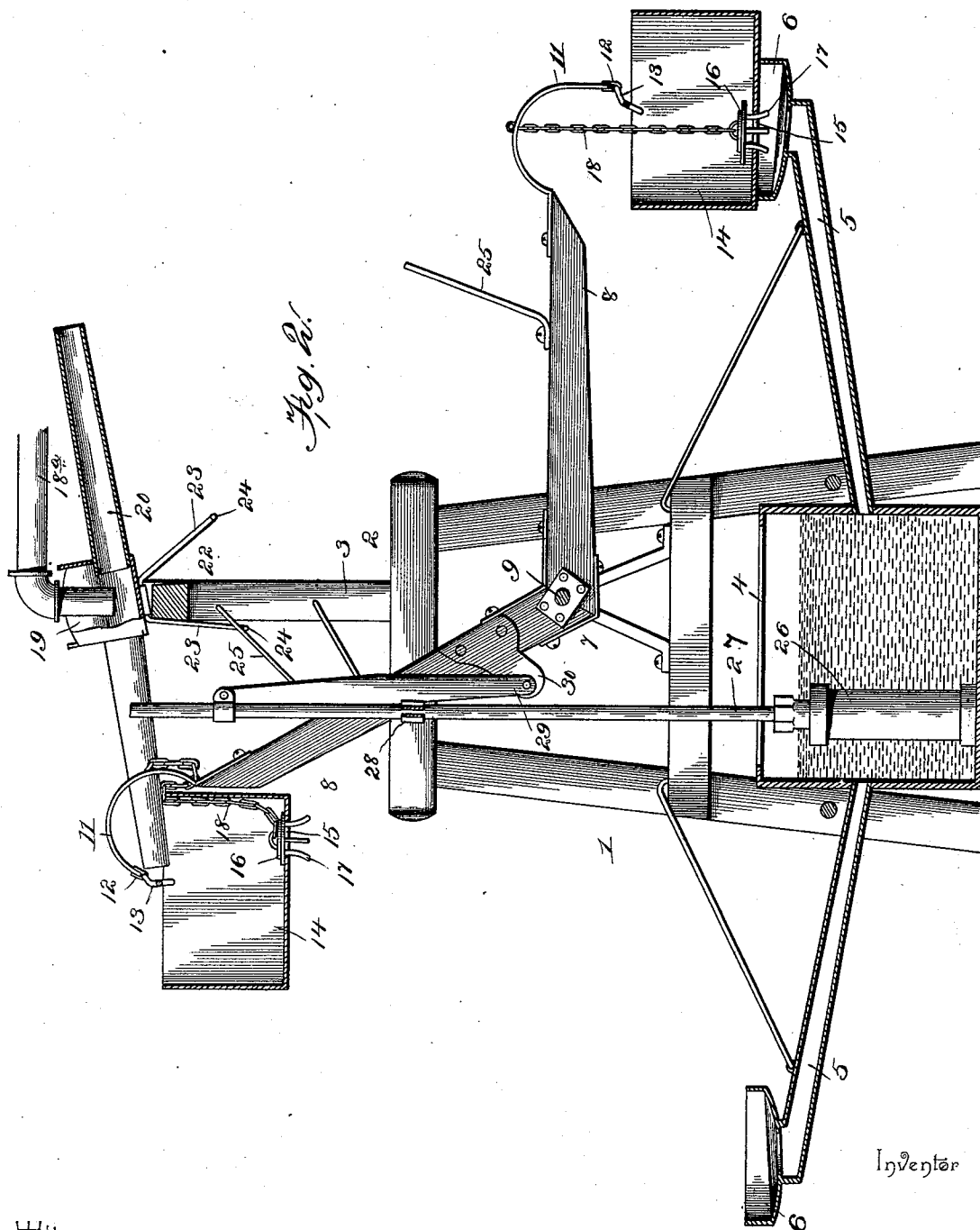
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3 Sheets—Sheet 2

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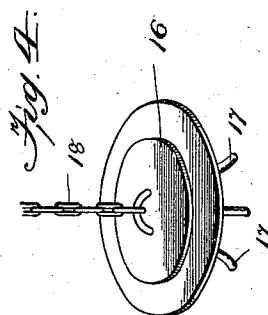
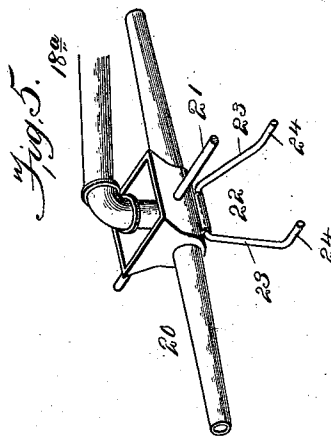
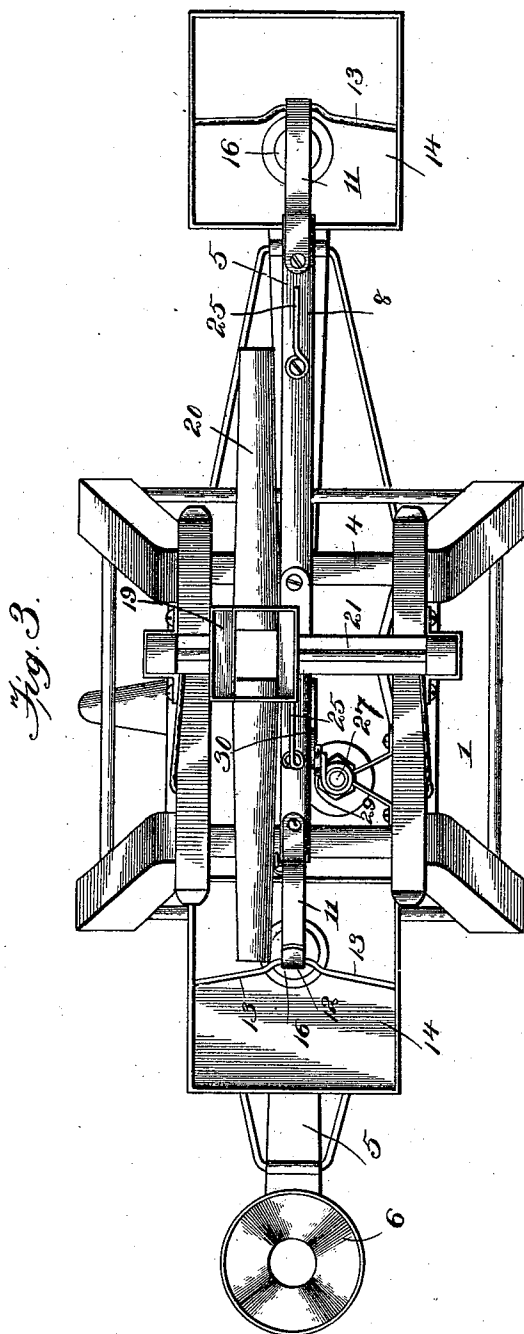
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3 Sheets—Sheet 3.

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Inventor

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UNITED STATES PATENT OFFICE.

ROBERT C. WATKINS, OF NASHVILLE, TENNESSEE.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 510,826, dated December 12, 1893.

Application filed June 17, 1893. Serial No. 478,003. (No model.)

To all whom it may concern:

Be it known that I, ROBERT C. WATKINS, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented a new and useful Water-Motor, of which the following is a specification.

My invention relates to a water motor adapted for operating pumps and other machinery, and it contemplates the provision of mechanism for utilizing the weight of water derived from an elevated source and conducted into trays or buckets connected to the opposite ends of an intermediately-fulcrumed rocking-lever, and means for alternately discharging the contents of said trays or buckets as they reach the limit of their downward movements; furthermore, the provision of means whereby the opposite bucket-carrying arms of the rocking-lever are shortened as they ascend and lengthened as they descend to increase the leverage of the descending bucket; furthermore, the provision of a tilting chute or discharge pipe for conducting the water alternately into the trays or buckets whereby the current of water is changed in direction alternately as the buckets reach their elevated or receiving positions to avoid the use of oppositely-operated controlling-valves; furthermore, the provision of trip mechanism for reversing the position of the chute or discharge pipe; and furthermore, means for connecting the operating-lever to the plunger-rod, whereby a plurality of pumps may be operated by a single motor.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings: Figure 1 is a side view of a water motor embodying my invention. Fig. 2 is a vertical sectional view of the same parallel with the plane of Fig. 1. Fig. 3 is a plan view. Fig. 4 is a detail view in perspective of one of the valves for controlling the outlets from the buckets. Fig. 5 is a detail view in perspective of the tilting chute or discharge pipe and hopper.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a supporting framework, which, in the construction illustrated in the drawings, comprises a tower 2, and an upright frame 3, secured to the top of said tower. Arranged within the tower at its bottom is a tank or receiver 4, with which communicate the oppositely-disposed conductors 5, provided at their outer ends with the horizontally-disposed cups 6.

7 represents a V-shaped rocking-lever, provided at the intersection of its angularly-disposed arms 8 with a shaft 9, which is mounted in bearings 10, carried by the supporting framework. The arms 8 are provided at their extremities with bowed extensions or hangers 11, provided at their outer ends with eyes 12, in which are fitted the bails 13, of the swinging trays or buckets 14. These trays or buckets are provided in their bottoms with outlet openings 15, having upwardly-opening controlling-valves 16, supplied with pendent guide-fingers 17, which extend downwardly through the outlet openings and are bent laterally to form stops to limit the upward movements of the valves. When the trays or buckets are lowered to the discharging position they are adapted to rest upon the cups arranged at the outer ends of the conductors with the outlet openings in position to discharge into the cups; and to each valve is attached the lower end of a flexible connection or chain 18, which is suspended from the highest point of the bowed extension or hanger to which the bucket containing said valve is secured. When the buckets are in their elevated positions they swing inwardly under the bowed extensions or hangers, thus slackening the connections or chains and permitting the valves to close, and when the buckets are in their depressed or lowered positions the distance between the highest point of the extension or hanger and the bottom of the bucket is greater than the length of the connection or chain, and hence the valve is elevated and opened to permit the discharge of the water into the conductor.

18^a represents a pipe extending from the source of the water-supply and discharging into the hopper 19 of the tilting chute or discharge pipe 20. This chute is carried by a shaft 21, and is provided with open unvalved ends adapted to discharge respectively into

the trays or buckets when elevated to the filling or receiving position. The chute is capable of a rocking movement sufficient to prevent the escape of water from the elevated end while flowing from the depressed end, and it is provided with a spider 22, having the depending oppositely-inclined legs 23, which are bent laterally at their free ends to form fingers 24. The arms of the rocking-lever carry trip-arms 25, which are adapted to alternately engage the members of the spider and tilt the chute in the direction of the elevated bucket.

26 represents the pump cylinder which, in the construction illustrated, is submerged in the water contained in the tank or receiver, and 27 represents the plunger-rod operating in a guide 28, and connected by means of a pitman 29, to a lateral projection 30, carried by one of the arms of the rocking-lever.

This being the construction of my improved water motor, the operation thereof, briefly stated, is as follows: With the parts of the mechanism in the positions shown in Figs. 1 and 2, in which the left-hand bucket is elevated and the other depressed, it will be seen that the tilting chute is discharging into the elevated bucket, the valve of which is closed, and that the depressed bucket, the valve of which is opened by the strain upon the connection, is discharging its contents into the subjacent cup which communicates by means of the attached conductor with the tank or receiver from which the pump derives the water to be elevated through the tubular plunger-rod and carried to the point of use. The arm to which the depressed bucket is connected is in a substantially horizontal position, while the other arm is arranged at an acute angle to a vertical plane embracing the fulcrum of the lever; and hence the effective length of that arm which carries the emptying bucket is greater than that of the receiving bucket. The result of this is that the depressed bucket will counterbalance the elevated bucket until the former is substantially empty and the latter is full, when the preponderance of the upper bucket will reverse the position of the lever and hence the relations of the buckets. As the previously-depressed bucket reaches the limit of its upward movement the trip-arm carried by that

arm of the lever to which said bucket is connected will engage the spider and reverse the position of the tilting chute, thus stopping the flow through the previously outlet end of said chute and directing the current into the empty bucket.

In practice it may be found desirable to vary slightly the relative positions of the parts and to connect two or more pumps to the operating-lever; and it may also be necessary in this connection to increase the relative sizes of the trays or buckets, and therefore it will be understood that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. The combination of a rocking-lever, swinging buckets loosely suspended from the extremities of said lever and provided with valved discharge openings, a reversible, centrally fulcrumed chute having a central hopper located under the discharge end of a stationary supply spout, legs depending from said chute near its fulcrum, and trip-arms carried by the arms of the rocking-lever to engage said legs to reverse the chute, substantially as specified.

2. The combination with a tank or receiver, oppositely-disposed cups, and conductors extending from the cups to the tank or receiver, of a V-shaped rocking-lever; swinging buckets suspended from the extremities of the arms of said lever and adapted when depressed to rest upon said cups with their discharge openings in position to discharge thereinto, valves fitting said discharge openings and means for controlling the same, a reversible chute adapted to discharge alternately into the buckets, and a trip mechanism for reversing said chute, substantially as specified.

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

ROBERT C. WATKINS.

Witnesses:

J. H. SIGGERS,
GEO. C. SHOEMAKER.