

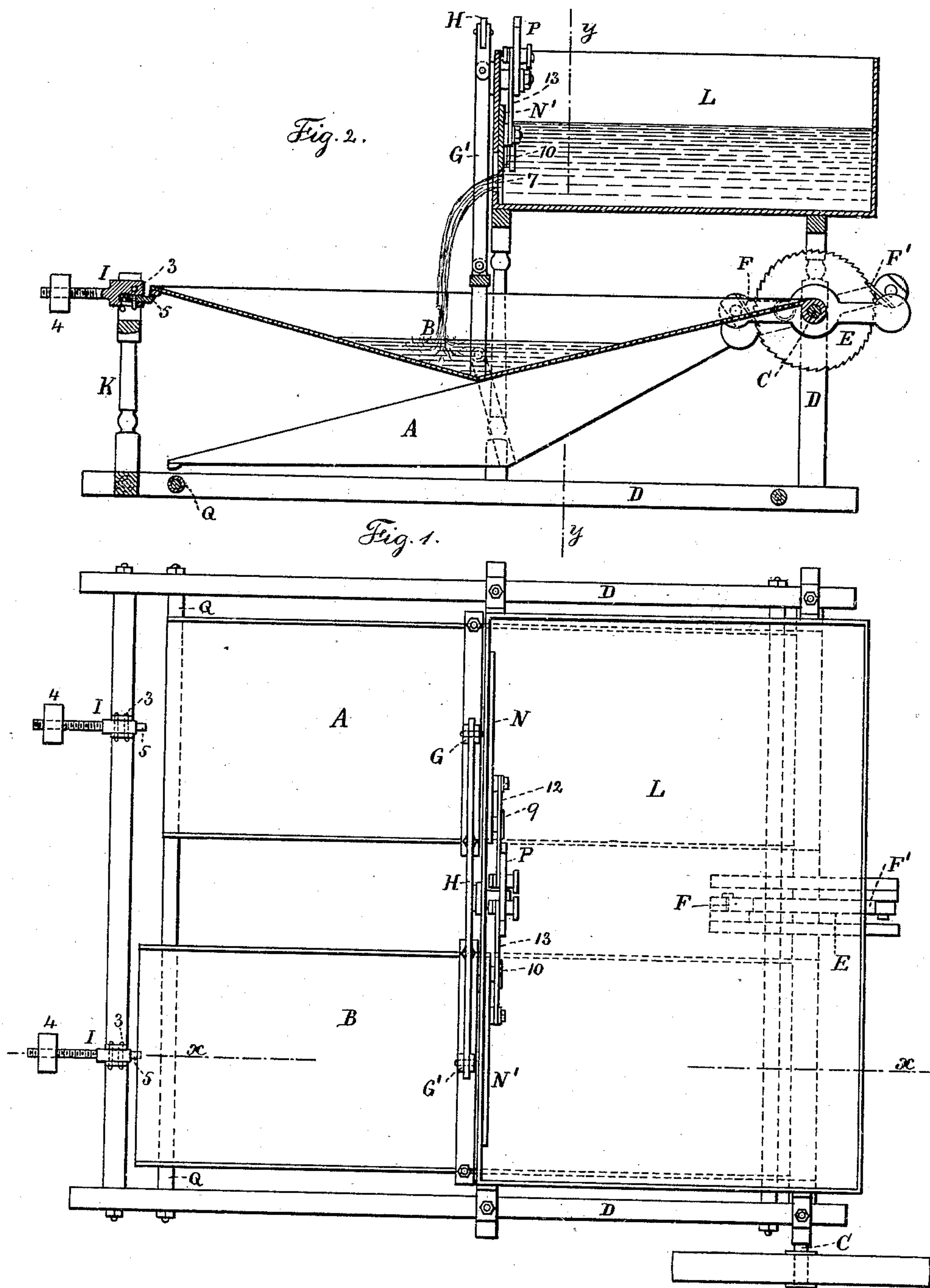
(No Model.)

2 Sheets—Sheet 1.

S. SMYTH.
WATER MOTOR.

No. 445,705.

Patented Feb. 3, 1891.



Witnesses:
J. Stait
Chas. H. Smith

Inventor:
Samuel Smyth
per Lemuel W. Ferrell atty

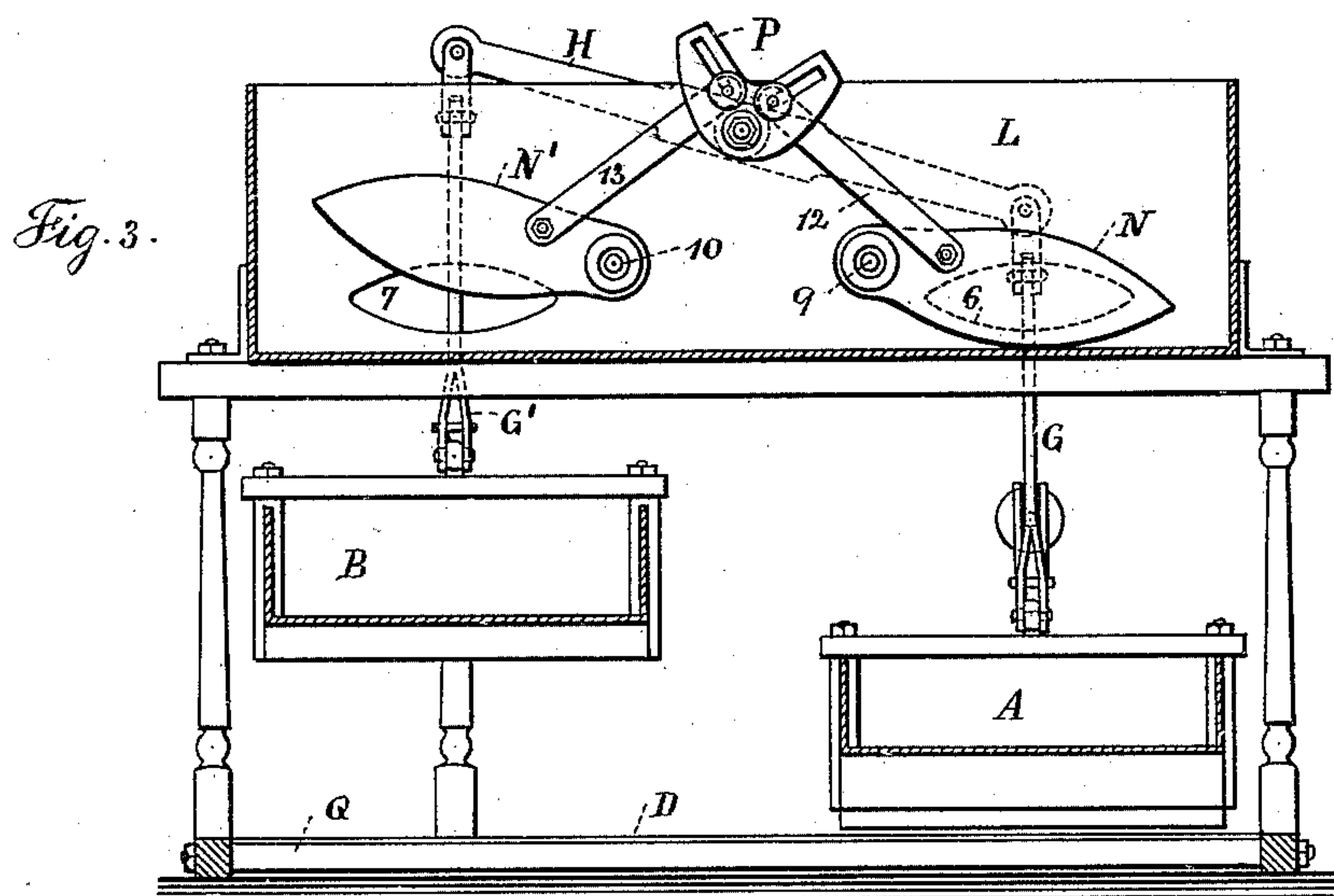
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UNITED STATES PATENT OFFICE.

SAMUEL SMYTH, OF ITHACA, NEW YORK.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 445,705, dated February 3, 1891.

Application filed September 1, 1890. Serial No. 363,674. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL SMYTH, of Ithaca, in the county of Tompkins and State of New York, have invented an Improvement in Water-Motors, of which the following is a specification.

Water-motors have heretofore been constructed in which there is a latch for holding the receiving-vessel in position until the proper amount of water has run into the same, and in some instances the latch has been resisted in its movement by a weight, and in other instances the latch has been withdrawn by a float, as in my patent, No. 429,392, granted June 3, 1890.

In my present improvements I make use of swinging receptacles acting alternately, and two supporting-latches, one for each receptacle, said latches being variable in their action, so as to yield with a greater or less weight of water in the receptacle, and connected with said receptacles there are gates for admitting water to first one receptacle and then the other, and the power derived from the movement of the receptacles is communicated to a pump or other mechanism from the shaft, which shaft also forms the pivot upon which the receptacles rock or swing.

In the drawings, Figure 1 is a plan view of my improvements. Fig. 2 is a section at the line *xx* of Fig. 1. Fig. 3 is a section at the line *yy* of Fig. 2.

The receptacles A B are represented in Figs. 1, 2, and 3 as pivoted or supported at one end upon the shaft C, such shaft being free to revolve, and it is supported in journals or bearings upon the frame D, and upon this shaft C there is a ratchet-wheel E, or two ratchet-wheels, and upon the receptacles A and B are pawls F F', that engage the ratchet-wheel E, and there are links G G' connected by cross-bars to the respective receptacles A and B, and at their upper ends these links are pivoted or hinged to the walking beam or lever H, so that as one receptacle descends by the weight of water passing into it the other and empty receptacle ascends, and the pawls F F' act alternately upon the ratchet-wheel E to turn the same by the leverage and weight of water passing into the receptacle as such filled receptacle descends, thus giving a pro-

gressive motion to the shaft C for actuating a pump or any other mechanism.

The weighted latches I are supported upon suitable devices, such as standards K, and each latch is pivoted at 3 and provided with an adjustable weight 4, which weight may be circular, having a screw-threaded hole through the center for the screw-threaded lever portion of the weighted latch, so that such weight may be placed nearer to or farther from the pivot 3 to vary the resistance of the latch to the movement of the receptacle. The latch end 5 of each weighted latch may be fitted to slide and be projected by a spring, as indicated in Fig. 2, or it may be made with a rule-joint, or in any other way that will allow the latch to yield to the moving edge of the receptacle, so that such receptacle is free to pass by the latch on the upward movement, and the latch falls or is projected by the spring in beneath the edge of the empty receptacle, so as to hold such receptacle in its elevated position until there is sufficient water in the receptacle to overcome the weight and leverage upon the weighted latch and cause such weighted latch to turn upon its pivot and allow the receptacle to descend for emptying the contents of such receptacle, and simultaneously raising the other receptacle into position for the water to flow into it. Thereby the operations are repeated successively and with more or less rapidity.

It will be observed that when the weights are adjusted into proximity with the pivot upon which the latch swings the movements of the apparatus will be more rapid, and the latches supporting the receptacle will yield when a less weight of water has accumulated. Therefore by adjusting the weights the holding power that supports the receptacle that is being filled can be lessened or increased to vary the rapidity of action of the apparatus, according to the resistance or power required upon the rotary shaft C or other mechanical device that is moved by the weight of the water in the receptacle.

I remark that, if desired, a fly-wheel may be used upon the shaft C to maintain a continuous movement of the same, and the movement is accelerated every time a receptacle descends, the pawl therewith connected acting upon the ratchet-wheel E to accelerate

the movement of such shaft and a fly-wheel to obtain a maximum power from a given quantity of water.

The power derived from this apparatus, together with the speed of rotation, is dependent upon the volume of water that is supplied in proportion to the resistance to the movement of the water-motor.

Any suitable means may be made use of for supplying water to the receptacles A B. I have shown a tank or vat L, into which the stream of water is allowed to flow, and there are openings 6 7 in the vat for the water to pass out into the receptacles A B, respectively, and there are valves N N' or gates to open and close these openings 6 and 7. I prefer to use valves swinging upon pivots 9 10 and actuated by the links or connecting-rods 12 13, that extend to connections upon the lever H, so that as such lever H is moved in one direction by the descent of the receptacle A the valve to that receptacle will close the opening 6 and simultaneously the opening 7 will be uncovered by the connecting-rod 13 moving the valve N' to open such water-way 7 to allow the water to run into the receptacle B, and when this receptacle B has received enough water to overcome the weighted lever I such receptacle B descends by forcing downward the weighted latch I, and the receptacle A is simultaneously raised up into position by the links G G' and lever H, and the valve N is moved to open the water-way 6, that supplies water to such receptacle A, as aforesaid.

It will be apparent that in this arrangement of receptacles and their connection to the shaft and the lever and connections to the valves or gates floats might be made use of, as in my aforesaid patent, for actuating the latches instead of such latches being weighted, and any suitable connections may be made between the valves or gates and the lever H; but I prefer to prolong the fulcrum or pivot of the lever H through the side of the vat L and attach to such pivot a rocker P, having two slotted arms, to which the upper ends of the rods 12 and 13 are attached, so that by varying the position of the connections to the slotted rockers the valves or gates can be

opened more or less, so as to permit the water-supply to pass more or less rapidly into the respective receptacles.

I remark that this apparatus can be adapted to any desired head of water, especially in view of the fact that the moving ends of the receptacles A and B may rise and fall a greater or less distance, and the water-supply can be in close proximity to the surface of the water in the receptacle when full.

It is generally preferable to provide a stop Q, upon which the moving ends of the receptacles fall, such stop being in the form of a cross-bar with a rubber tube drawn over the same.

I claim as my invention—

1. The combination, with the receptacles A and B, of the shaft C, upon which the receptacles swing as they are raised or lowered, the connecting-lever H and links G G', the ratchet-wheel and pawls for giving to the shaft a rotary movement from the swinging movement of the receptacles and the water-supplying device, and a supporting-latch to each receptacle, substantially as set forth.

2. The combination, with the swinging receptacles A and B, of the links G G' and lever H for connecting the receptacles and elevating the empty receptacle by the downward movement of the full receptacle, the valves or gates to the water-supply openings, the connections to the same from the lever, and latches for holding the respective receptacles while in an elevated position, substantially as set forth.

3. The combination, with the receptacles A and B, of the lever H, the links G G', connecting the ends of the lever to the respective receptacles, the rocker P, connected to and moving with the lever H, the valves or gates, and the connecting-rods adjustably connected to the rocker P for varying the opening and closing of the valves or gates, substantially as set forth.

Signed by me this 27th day of August, 1890.

SAMUEL SMYTH.

Witnesses:

M. C. TOWNSEND,
E. M. FINCH.