

J. G. MECHAM.
HYDROSTATIC MOTOR.
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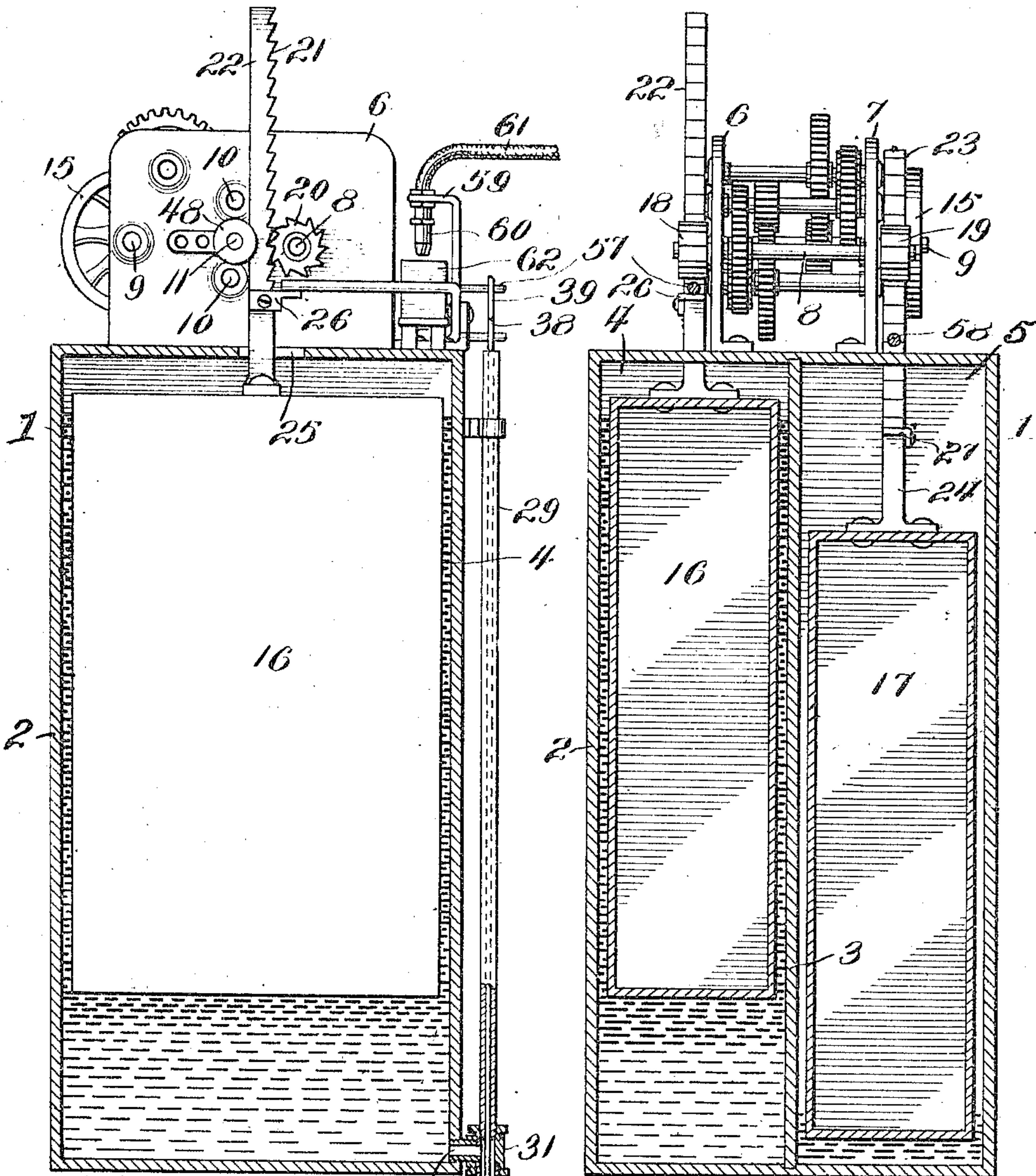
999,579.

Patented Aug. 1, 1911.

2 SHEETS-SHEET 1.

Fig. 1.

Fig. 2.



Witnesses

J. L. Wright
James G. Mecham

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Inventor
James G. Mecham.

67. By *Victor J. Evans*

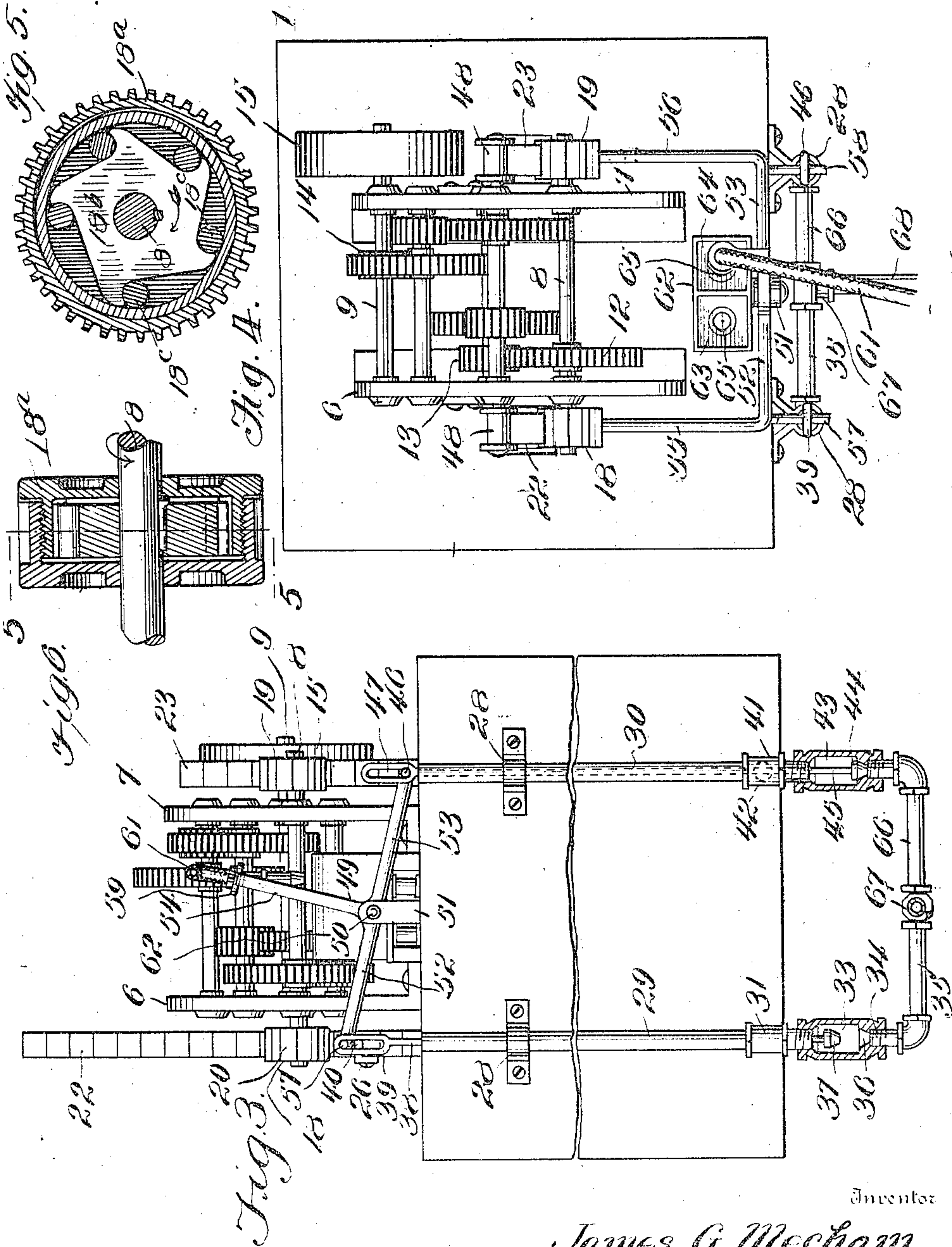
Attorney

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Inventor

James G. Mecham

Victor J. Evans,

Attorney

Witnesses

J. T. L. Wright,
J. A. L. L.

UNITED STATES PATENT OFFICE.

JAMES G. MECHAM, OF OAKLAND, CALIFORNIA, ASSIGNOR TO HYDROSTATIC MOTOR CO., OF OAKLAND, CALIFORNIA, A CORPORATION OF ARIZONA TERRITORY.

HYDROSTATIC MOTOR.

999,579.

Specification of Letters Patent.

Patented Aug. 1, 1911.

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To all whom it may concern:

Be it known that I, JAMES G. MECHAM, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Hydrostatic Motors, of which the following is a specification.

This invention relates to hydrostatic motors, and has for an object to provide a motor of this character with means so that the lifting force of water is concentrated and delivered at one point and readily converted into motive power for operating various power driven machines.

A further object of this invention is to provide a plurality of compartments and means for creating an artificial rise and fall of water adapted to control the movement of buoyant bodies which are provided to operate in their movement a drive shaft, and to provide simple and effective means for alternately supplying water to and discharging it from the said compartments.

Other objects and advantages will be apparent as the nature of the invention is better set forth, and it will be understood that changes within the scope of the claims may be resorted to without departing from the spirit of the invention.

In the drawings, forming a portion of this specification and in which like numerals of reference indicate similar parts in the several views:—Figure 1 is a sectional view through the hydrostatic motor, parts being shown in elevation. Fig. 2 is a view taken at right angles to Fig. 1. Fig. 3 is an end view. Fig. 4 is a top plan view. Fig. 5 is a sectional view, on line 5—5 of Fig. 6, showing a modification of the ratchet mechanism. Fig. 6 is a section taken at right angles to that shown in Fig. 5.

Referring now more particularly to the drawings, there is shown a hydrostatic motor 1 comprising a receptacle or tank 2 having a centrally located partition 3 provided with vertical compartments 4 and 5. The receptacle or tank 2 has mounted upon the top thereof brackets 6 and 7 in which is revolubly mounted a drive shaft 8, a driven shaft 9, and a plurality of intermediate shafts 10 and 11. The shaft 8 has keyed thereto a gear wheel 12 adapted to drive a train of gears 13 upon the shafts 10 and 11, one gear of the said train being in mesh with a gear 14 upon the drive shaft 9. The

said drive shaft is preferably provided with a band pulley 15 for receiving a belt or the like for transmitting power from the motor to a machine to be operated.

The compartment 4 has mounted therein a vertically sliding buoyant body 16, preferably hollow, and is substantially of rectangular form. The compartment 5 has mounted therein a buoyant body 17 of a construction identical to the body 16. The shaft 8 has secured thereto at its ends wheels 18 and 19 each being provided with an annular series of spur teeth 20. The wheel 18 is constructed in such manner that the teeth thereof normally engage correspondingly shaped teeth 21 upon a vertically disposed rack bar 22 secured at its lower end to the buoyant body 16 see Figs. 1 and 2. The teeth of the wheel 19 are engaged with teeth 23 of a rack bar 24 secured at its lower end to the upper end of the buoyant body 17. The rack bars 22 and 24 are slidably mounted through somewhat elongated passages 25 formed in the top of the receptacle or tank 2, as clearly shown. The rack bar 22 has projecting therefrom a trip element 26, and the bar 24 is provided with a similar trip element 27 for a purpose to be hereinafter described.

Figs. 5 and 6 show a modification of the ratchet mechanism, a hollow spur gear 18^a being keyed on shaft 8 and adapted to mesh with a corresponding rack bar provided interiorly with a clutch disk or wheel 18^b whose teeth engage pins 18^c fixed to the body of the gear.

The tank or receptacle has secured thereto by means of brackets 28 vertically disposed parallel spaced guide tubes 29 and 30, the tube 29 being provided for the compartment 4 and the tube 30 being provided for the compartment 5. The tube 29 is provided at its lower end with a coupling member 31 having a pipe connection 32 engaged at one end in an opening at the lower end of the compartment 4, and the said member 31 has depending therefrom a valve chamber 33 in which is formed a discharge opening 34 for receiving one end of a discharge pipe 35. Immediately above the opening 34 the chamber 33 is provided with a valve seat 36 preferably constructed with flaring walls to receive an inverted cone shaped valve 37 at the lower end of a vertical stem 38 mounted in the tube 29. The stem 38 is provided

at the upper end thereof with an enlarged head 39 having a vertically disposed or elongated slot 40 formed therein. The tube 30 is provided at its lower end with a coupling member 41 having a pipe connection 42 engaged at one end in an opening at the bottom of the compartment 5. The member 41 has depending therefrom a valve chamber 43 identical in construction to the chamber 33 and has slidably mounted therein a valve 44 which is secured at its lower end to a stem 45 adapted to work in the said tube 30. The stem 45 is provided at its upper end with an enlarged head 46 having an elongated slot 47 formed therein. The brackets 6 and 7 carry grooved rollers 48 adapted to engage portions of the rack bars 22 and 24.

An oscillating element 49 is pivotally connected as shown at 50 to a bracket 51 at the top of the tank or receptacle 2 and comprises arms 52, 53 and 54 disposed angularly to each other. The arm 52 has a right angularly disposed inwardly directed portion 55 at one end of its outer extremity disposed in the path of movement of the trip element 26, and the arm 53 is provided with a right angularly disposed portion 56 disposed in the path of movement of the trip element 27. The arm 52 also has projecting therefrom a horizontally disposed pin 57 disposed to operate or move in the slot 40 at the upper end of the stem 38. The arm 53 has projecting therefrom a horizontally disposed pin 58 adapted for operation in the slot 47 at the upper end of the stem 45.

The arm 54 is provided with an angle portion 59 adapted to receive a water discharge nozzle 60 connected in a suitable manner to a hose or supply pipe 61. It is obvious that the pipe 61 or hose may receive water from any suitable source. A trough 62 is mounted upon the top of the tank or receptacle 2 and is provided with compartments 63 and 64. The compartment 63 is provided with a depending pipe 65 connected at its lower end to the tank so that water from the said compartment 63 may be conveyed to the compartment 4 of the said tank 2. The compartment 64 of the trough 62 is provided with a depending pipe 65 connected at its lower end with the tank or receptacle 2 so that water from the said compartment 64 may be deposited into the compartment 5 of the receptacle or tank.

The valve chamber 43 is connected by way of a pipe 66 to a T-coupling 67, the said coupling also receiving the pipe 35 from the chamber 33, and as shown, the said coupling has connected thereto a discharge pipe 68.

In operation, water is delivered to the hose or pipe 61 and is discharged from the nozzle 60 into the trough 62. As shown in Figs. 3 and 4 the oscillating element 49 is in such position that the nozzle 60 is dis-

posed immediately above the compartment 64 so that water is discharged into the compartment 5 of the tank or receptacle. In the said position of the nozzle the arm 52 of the element 49 is raised at its outer end so that the pin 57 is at its full upward movement, and by reason of the fact that the said pin is connected in the manner described to the stem 38 it will be seen that the valve 37 is displaced or raised from the seat 36 to effectively allow water from the compartment 4 to pass through the valve chamber 33 and out of the discharge pipe 67. As soon as water in the compartment 5 has reached the predetermined level it is obvious that the trip element 27 will engage the portion 56 of the arm 53 to accurately rock the element 49 so that the valve in the chamber 43 is opened to permit the discharge of water and to simultaneously close the valve in the chamber 33 to prevent the discharge of water.

The operation of the motor is extremely simple, as the motor is composed of but few operative parts and is so constructed that water from suitable sources may be fed alternately into the two compartments of the motor to alternately effect a rise and fall of water to cause the buoyant bodies to ascend and descend, as is obvious, to transmit power to the drive shaft 8 through the medium of the rack bars 22 and 24 and their cooperating toothed wheels 18 and 19 and to finally impart through the said gear train motion to the driven shaft.

Having thus described the invention what is claimed as new, is:—

1. A motor of the class described comprising a receptacle having a plurality of compartments, discharge valves for said compartments, an oscillatory element, a trough having compartments communicating with the respective compartments of the said receptacle, a water inlet connection carried by the said oscillatory element, stems extending from the said oscillatory element and operatively connected with the said valves to alternately open them, rack bars slidably mounted in the receptacle, buoyant bodies supported by the said rack bars, a train of gearing geared to the rack bars and driven thereby in the rise and fall of the said buoyant bodies, brackets supported by the rack bars, and means on the oscillatory element disposed in the path of movements of the brackets on the said rack bars to be engaged thereby and adapted through such engagement to impart movement to said oscillatory element.

2. In a motor of the character described, a receptacle having a plurality of water compartments, a trough having compartments communicating with the compartments of the said receptacle, discharge valves for the compartments of the recep-

tacle, a bracket mounted on the receptacle for oscillatory movement and provided with a water inlet connection for discharging water alternately to the compartments of the trough, buoyant bodies located in the compartments of the receptacle, gearing driven by the said buoyant bodies in their rise and fall with the water in the compartments, operative connections between said oscillatory element and the valves, and means on the oscillatory element cooperating with means on the buoyant bodies for imparting movement to the said oscillatory element.

3. In combination, a receptacle divided into two compartments, floats independently movable in the compartments, rack bars secured to the floats and extending above the compartments, a train of gears coacting with the rack bars, a T-shaped member pivoted for vertical movement above the receptacle, a trough mounted on the receptacle and provided with compartments communicating with the compartments of the receptacle, a water nozzle carried by said T-shaped member and adapted to supply water to each of the compartments of the trough, means carried by the T-shaped member adapted to engage the racks, discharge pipes communi-

cating with the compartments of the receptacle and provided with valve seats, valves movable in said discharge pipes and against said valve seats, and rods connecting said valves and having slidable connection with the T-shaped member.

4. In a motor of the class described, the combination with water compartments arranged side by side, and having floats located in the respective compartments and provided with vertical stems, discharge valves for said compartments, a water inlet pipe adapted to oscillate laterally, means connecting such inlet pipe with the afore-said valves for operating the latter automatically, a water-receiving trough fixed above the float compartments and having chambers communicating with them respectively, trip mechanism operatively connecting the inlet pipe with the floats, whereby it is swung laterally when a float rises, and gears operatively connected with the float stems, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES G. MECHAM.

Witnesses:

W. G. HEFLINGER,
DAVID MITCHEL.