

(No Model.)

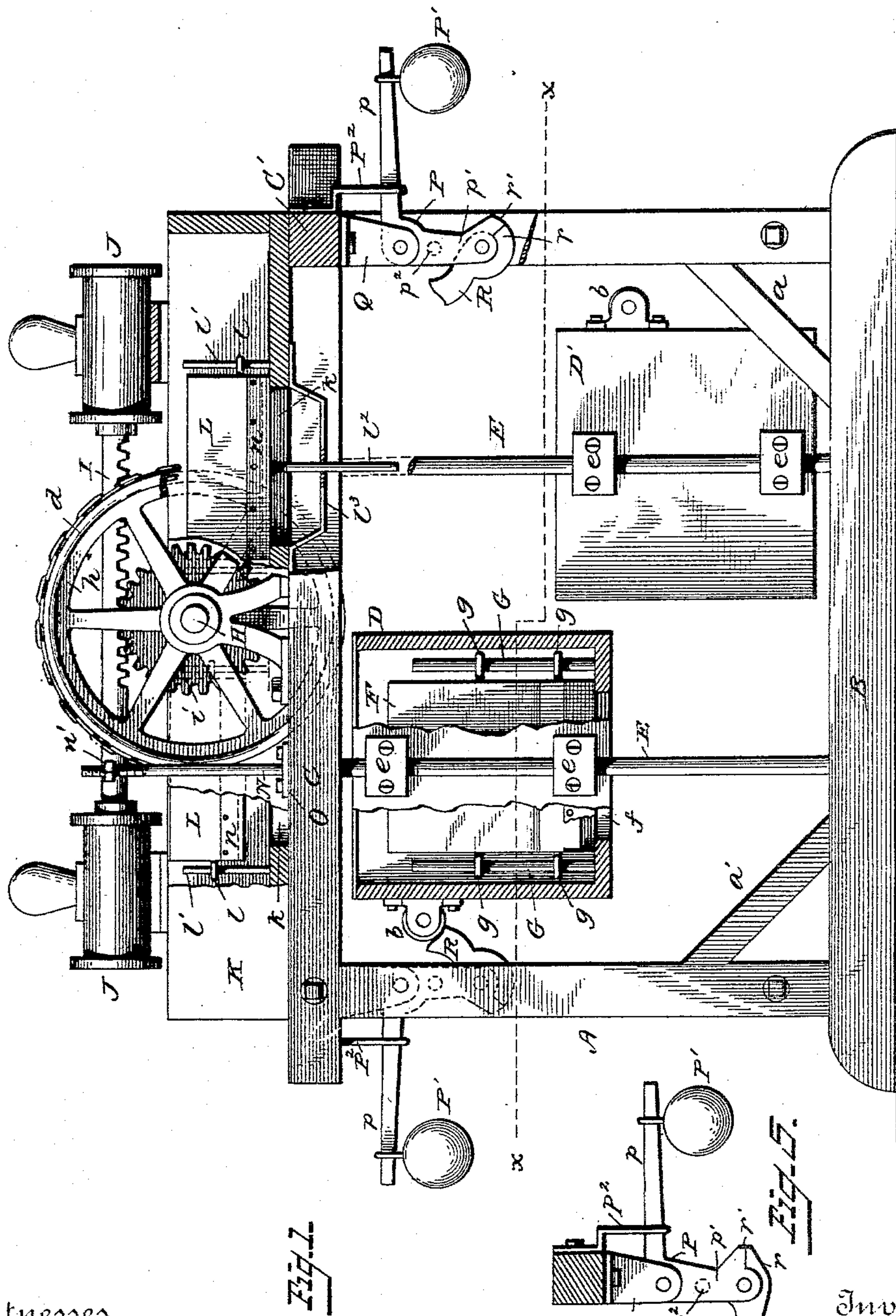
2 Sheets—Sheet 1.

J. WILHELM.

WATER MOTOR.

No. 388,750.

Patented Aug. 28, 1888.



Witnesses,
Wm. L. Steider,
Van Buren Hillyard.

Inventor,
Jacob Wilhelm.
By his Attorney,
R. B. A. Lacey.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

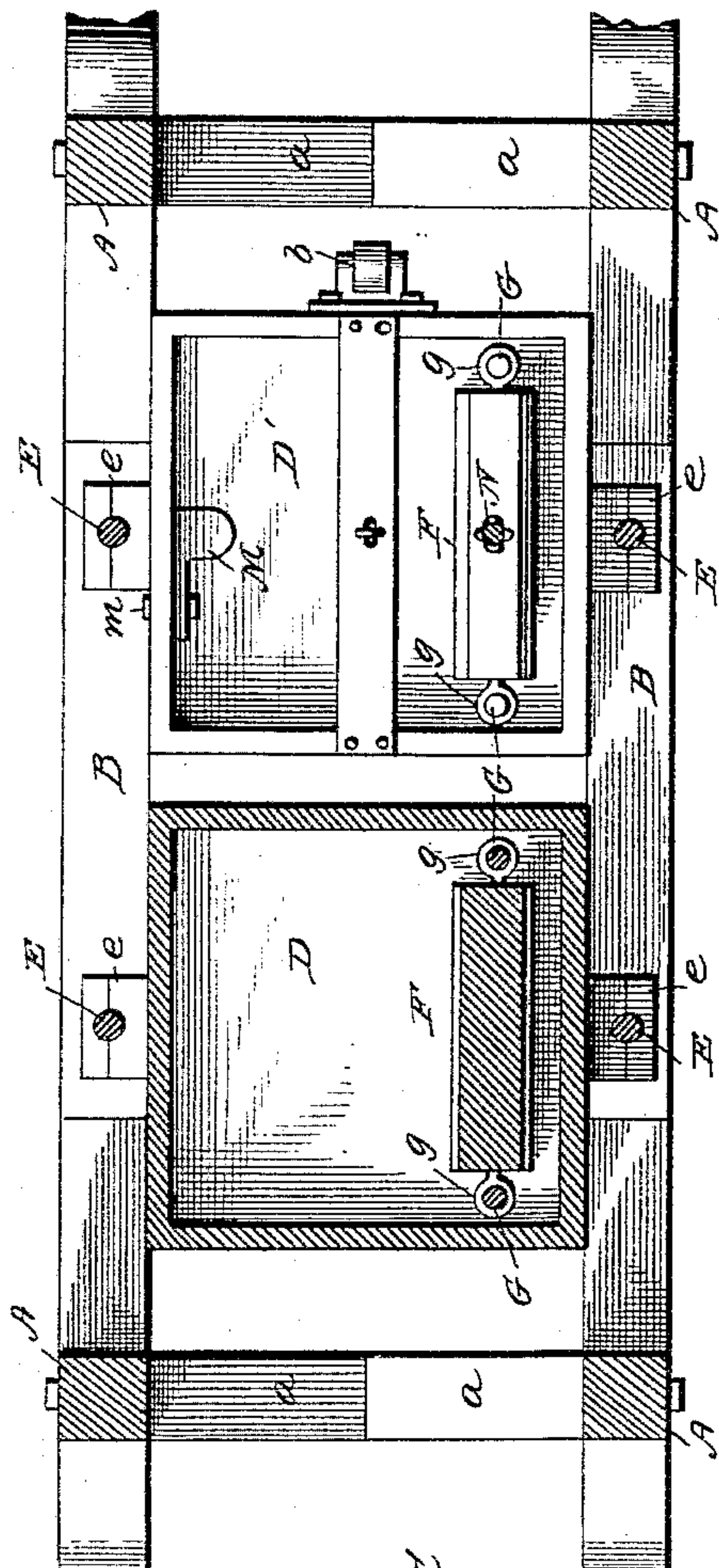
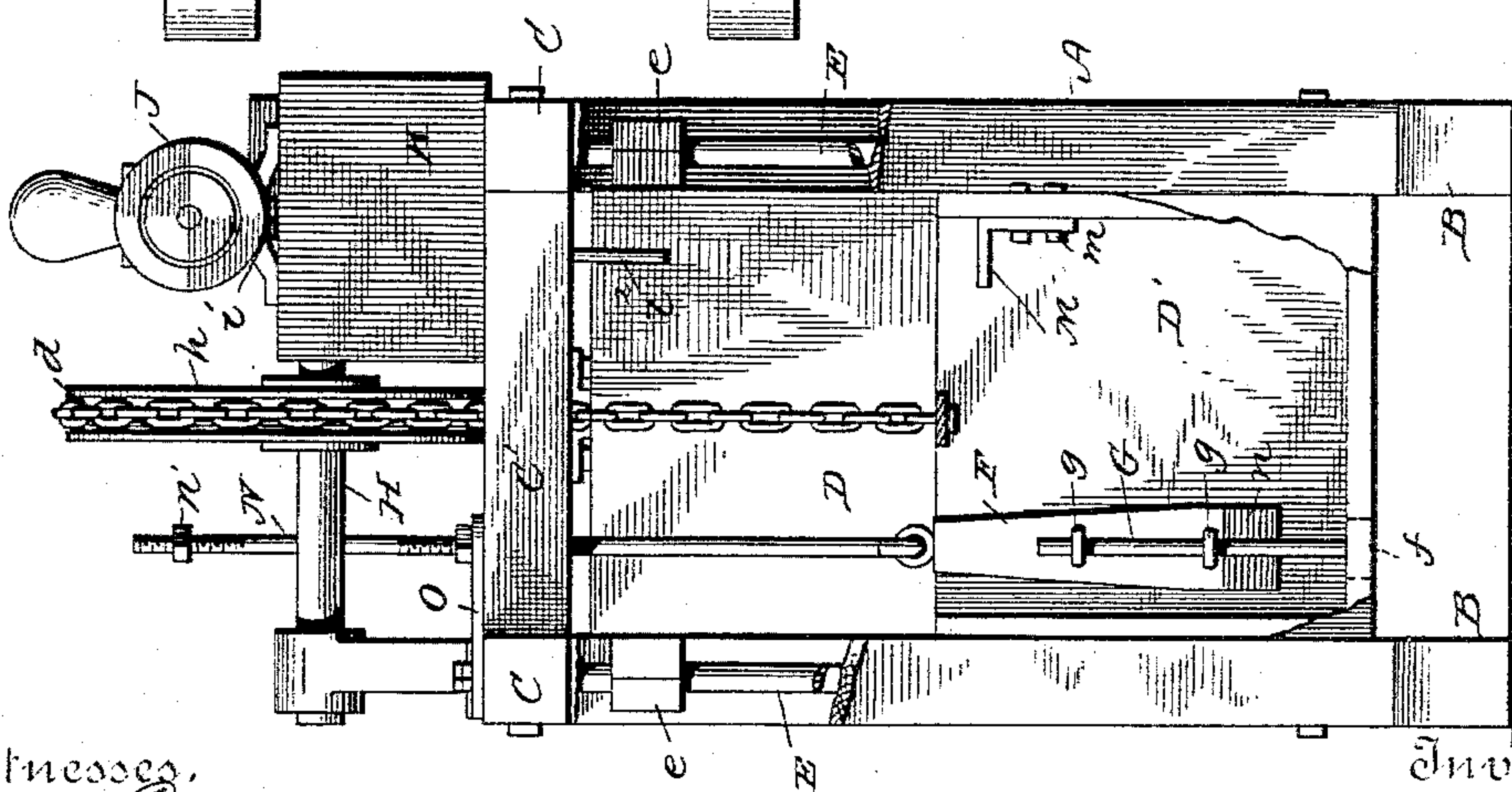
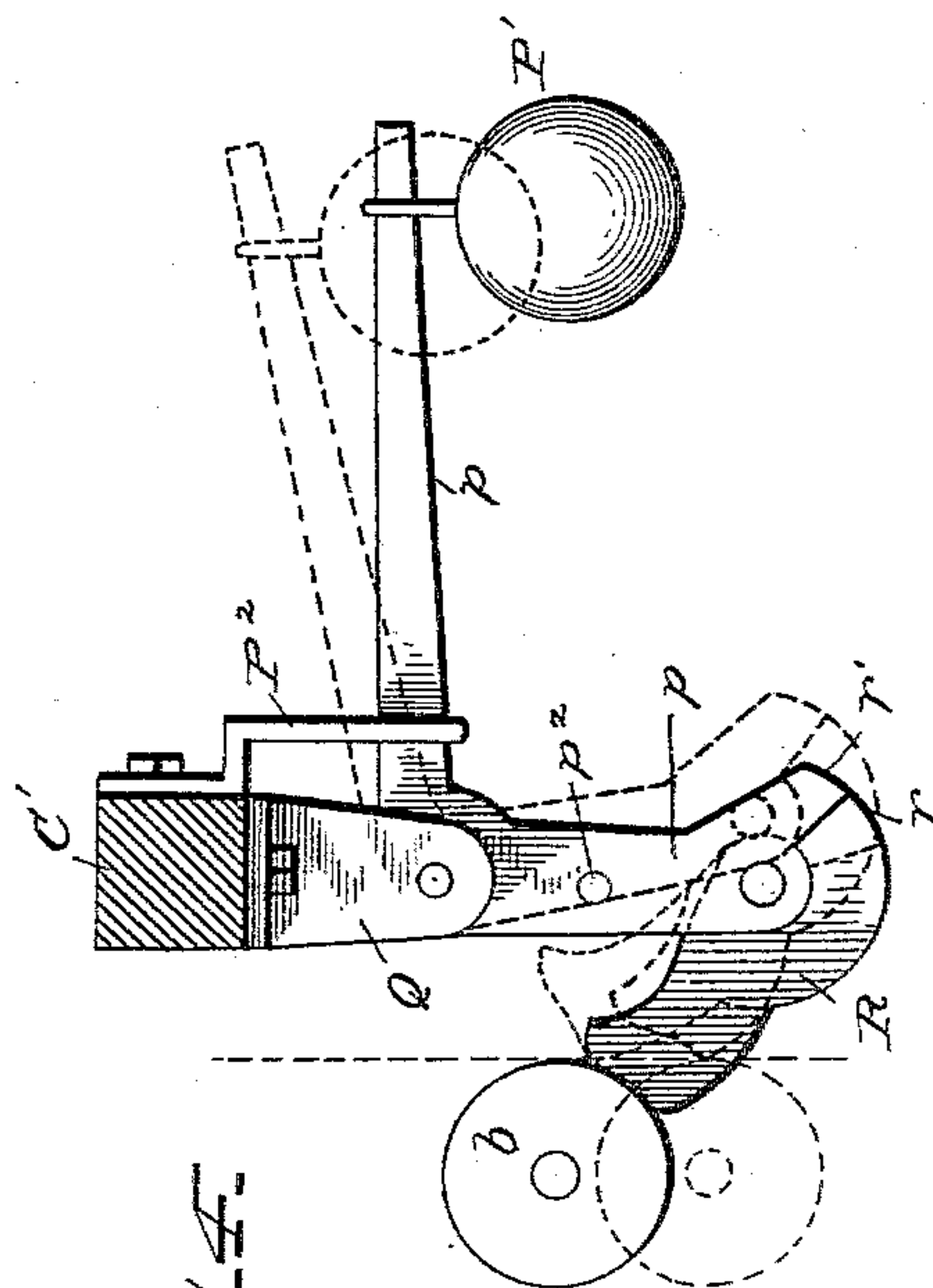


Fig. 4.



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Fig. 5.

Inventor,

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UNITED STATES PATENT OFFICE.

JACOB WILHELM, OF NEW FREEDOM, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO JAMES EMORY CUNNINGHAM, OF SAME PLACE.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 388,750, dated August 28, 1888.

Application filed January 21, 1888. Serial No. 261,530. (No model.)

To all whom it may concern:

Be it known that I, JACOB WILHELM, a citizen of the United States, residing at New Freedom, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Water-Motors; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to hydraulic motors, or motors which utilize the gravity of water or other fluid media as the impelling force or power medium, and vertically-reciprocating carriers as the recipients of such media, which is supplied to each alternately at their highest point of travel. The carriers, generally two, are connected to travel in opposite directions, the one elevating while the other is lowering, and vice versa. While one carrier is loading the other is unloading, each being held in its relative position by a weighted lever or equivalent means until the one loading has received a given weight, when it will automatically disengage itself and descend, at the same time lifting the other carrier into position to receive its load. The carriers discharge their load in a less time than it takes to load them; hence it is expedient to devise a means to hold the carrier being loaded until it has received a given weight. The bottom of each carrier is provided with a discharge-opening for the escape of the fluid medium, which is closed by a valve, and that this valve may not be held down by a too great pressure of the water its top extends to the top of the carrier, or thereabout, and its sides are approximately parallel, or converge very slightly, so that the water may exert sufficient pressure thereon to hold it down on its seat. The weighted lever for holding the carrier at its highest position is provided with a pivoted catch or detent, which turns up out of the way when the carrier is rising and falls back in the path of the said carrier, or a portion thereof, to engage therewith and prevent the descent of the carrier until properly loaded. The power may be

transmitted from either or both of the carriers directly or by means of intermediate connections.

The improvement consists of the novel features hereinafter more fully described and claimed, and shown in the annexed drawings, in which—

Figure 1 is a side view, parts being broken away, of a motor of my invention; Fig. 2, an end view of the motor, showing the side of the carrier removed; Fig. 3, a top sectional view on the line XX of Fig. 1, the weighted levers and their supporting-brackets being removed; Fig. 4, a detail side view of the weighted lever, showing the operation of the same; and Fig. 5, a side view of a modified form of weighted lever.

The frame is composed of the corner posts, A, bottom side and end sills, B and B', respectively, and top side and end beams, C and C', respectively. The frame is braced by the stays *a* and *a'*, which are interposed between the side end sills, B and B', and the corner posts, A.

The carriers or buckets D and D', located in different vertical planes, are adapted to travel vertically, being guided in their movements by the guide-bars E, which are interposed between the beams C and the sills B, and pass through the guide-bearings *e*, secured to the sides of the said buckets or carriers, which may be of any suitable dimensions and form. Each bucket or carrier has a discharge-opening, *f*, in its bottom, which is closed by a valve, F, which extends to about the top of the bucket or carrier and has its sides nearly parallel. The edges of the valve are provided with eyebolts *g* at different levels, which embrace the vertical guide-bars G, extending up from the bottom of the carrier or bucket to guide the said valve in its vertical movements. The sides of the valve converge slightly near the upper portion of the said valve to receive a certain percentage of pressure of the fluid to hold the said valve down and overcome in part the buoyancy of the fluid thereon. The carriers or buckets are connected together by the chain or cable *d*, which passes over a pulley, *h*, keyed to the shaft H, mounted in bearings on the top of the frame. The gear-wheel *i*, secured to the

shaft H, meshes with and imparts motion to the rack-bar I, which transmits said motion to the desired machine, which, as shown, is the pump J, one being located at each end of the rack-bar or piston-rod.

The trough K, for holding the water or other fluid to be supplied to the buckets or carriers, is located on the frame, and has openings *k* in its bottom corresponding to the position of the said carriers or buckets D and D', that are closed by valves L, constructed similarly to the valves F, and guided in their vertical movements by the eyebolts *l* and the guide-rods *l'* above the bottom of the trough, and by the stems *l''* and the truss-bar *l'''* below the bottom of the trough. The stems *l''*, that depend from the valves L, project some distance below the truss-bars *l'''*, and are adapted to be struck by brackets M, secured to the sides of each of the carriers or brackets D and D' by the bolts *m*, to unseat the valve and permit the fluid to escape into the bucket or carrier, whichever one may be at its highest elevation.

The several valves F and L are made of wood, and the lower edge of each is provided with a band, *n*, of metal, rubber, or leather, which forms a concavity below the valve and insures a close fit between the lower edge of the band and the bottom of the trough. The valves F are each provided with a rod, N, that extends up through a bracket, O, secured to the beam C, and is provided with an adjustable stop, *n'*, to regulate the distance of movement of the valve when lifted from its seat. The rod N works freely through O, and when the carrier or bucket settles or descends the stop *n'*, engaging with O just before the said bucket reaches its lowest position, unseats the valve and allows the load or fluid to escape.

The weighted levers P—one for each bucket or carrier—are constructed alike; hence a description of the construction and operation of one will suffice for both. The lever P, having a horizontal arm, *p*, and a vertical extension, *p'*, is pivoted to the depending bracket Q at the point of junction of *p* and *p'*. The catch or detent R, pivoted to the lower end of *p'*, is adapted to stand out from *p'* either at an acute angle, Fig. 4, or a right angle, Fig. 5, being held in such position by a shoulder or extension, *r*, abutting against a corresponding shoulder or extension, *r'*, of *p'*. The end of R normally projects within the path of the carrier or bucket or an extension, *b*, thereof to engage therewith and hold the bucket or carrier while being loaded, and is adapted to turn up out of the way when the carrier is ascending, so as not to impede its movement or detract from the force of the descending bucket or carrier. When the bucket or carrier has risen, the detent or catch R gravitates and automatically falls within the path of the bucket or its extension *b* and holds it elevated until sufficiently loaded to overbalance the

weight P' on P, when P turns on its pivot and disengages R from the said bucket or its extension, when the said bucket will descend. The catch is so disposed that it will not fold too close to *p'*, so as to bring the center of gravity over its pivotal support, but just enough to permit the bucket or carrier to clear it when rising and have the center of gravity thereof to one side of said pivotal support, so R will automatically fall back within the path of the said bucket or carrier or its extension. To prevent R folding too close, especially when struck quickly, it has been found expedient to provide *p'* with a stop, *p''*, for R to strike against and limit its upward movement. The weighted lever P is held in a normal position by the stirrup P², which supports its horizontal branch and permits it to rise when P is overbalanced.

The weight P' being adjusted on P according to the work to be performed, and K being supplied with a fluid medium, the motor is in readiness to operate, which is accomplished by elevating one of the carriers or buckets until it is held by the weighted lever. The bracket M, striking *l''*, will have opened the valve in K, and the medium from K escaping into the said bucket will weight it, and when the weight of the bucket or carrier is in excess of the weighted lever said bucket or carrier will automatically disengage itself from P and descend, and just before reaching its lowest position *n'* will engage with O and lift F and discharge said load. During the descent of said bucket the corresponding bucket is rising, and when the one is unloading the other is loading.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a water-motor, the combination of the tank having openings in its bottom, the valves extending about the full height of the tank and having the edges parallel and the sides slightly converging, the stems depending from the valves, the two carriers connected together and adapted to reciprocate alternately in a vertical direction and strike against the said stems, and the two weighted levers adapted to alternately engage with the carriers and hold them while the one is loading and the other is unloading, substantially as and for the purpose specified.

2. The combination, with the counterbalancing carrier or bucket and the valves F, of the brackets O, the rods N, and the adjustable stops *n'*, substantially as and for the purpose described.

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

JACOB WILHELM.

Witnesses:

J. EMORY CUNNINGHAM,
THEO. B. SEITZ.