

(No Model.)

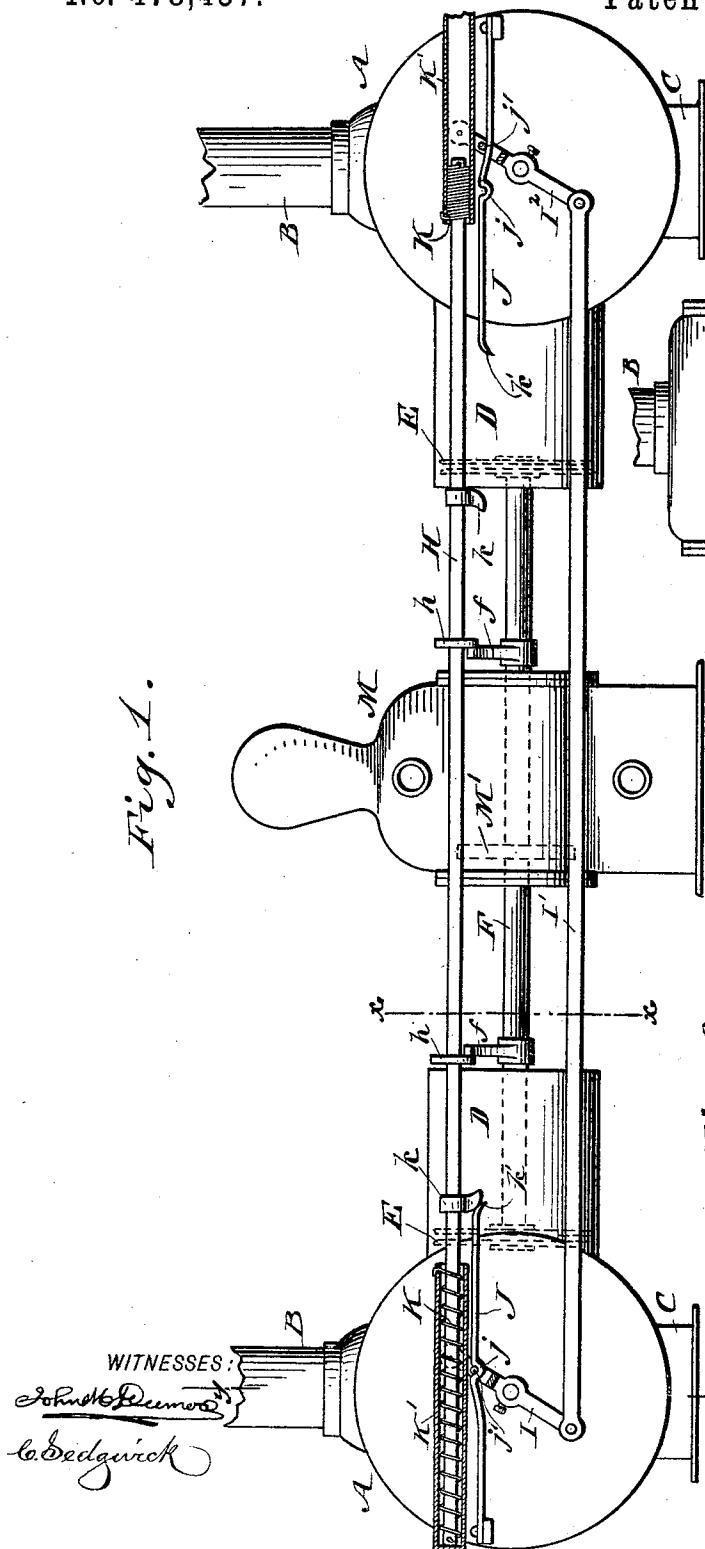
2 Sheets—Sheet 1.

B. S. PARTRIDGE.
WATER MOTOR.

No. 478,457.

Patented July 5, 1892.

Fig. 1.



WITNESSES:
John B. Deane
Edgewick

Fig. 3.

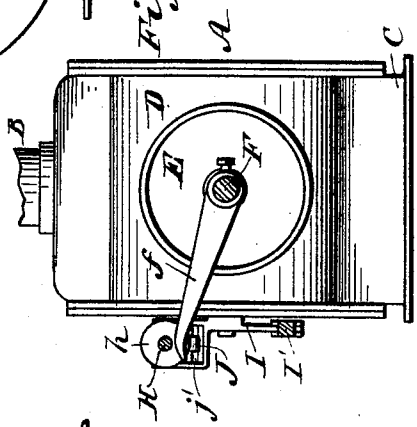
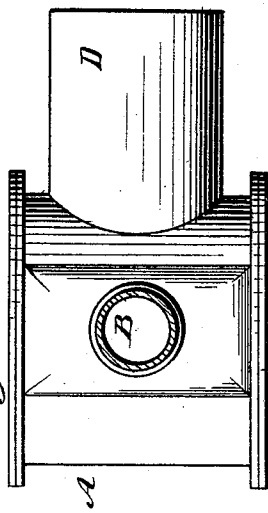


Fig. 2.



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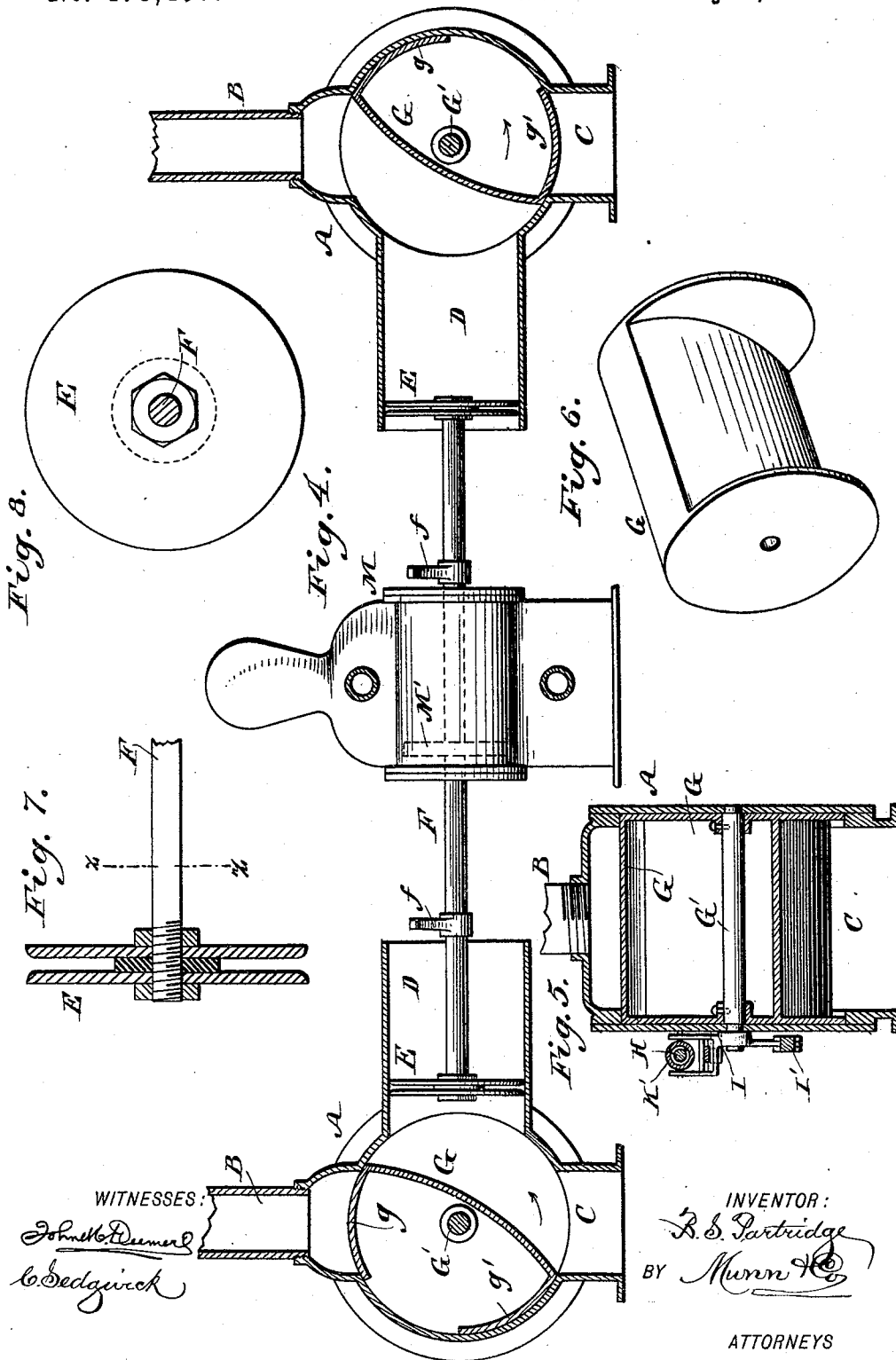
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

BENJAMIN S. PARTRIDGE, OF JACKSONVILLE, FLORIDA.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 478,457, dated July 5, 1892.

Application filed July 14, 1891. Serial No. 399,511. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN S. PARTRIDGE, of Jacksonville, in the county of Duval and State of Florida, have invented a new and useful Improvement in Water-Motors, of which the following is a full, clear, and exact description.

My invention relates to motors in which water is employed as the motive agent; and its object is to provide a device of this character adapted for connection to Artesian wells, and wherein with a low pressure of water a high degree of power may be obtained for actuating machines of various kinds and for various purposes.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the water-motor. Fig. 2 is a plan view of one of the power-cylinders and its valve-chest, the supply-pipe appearing in horizontal section. Fig. 3 is a transverse sectional view taken on the line *xx* in Fig. 1. Fig. 4 is a side elevation of the motor, the power-cylinders, and their valve-chests appearing in vertical section. Fig. 5 is a longitudinal section of one of the valve-chests, taken on the line *yy* in Fig. 1. Fig. 6 is a perspective view of one of the valves of the motor. Fig. 7 is a vertical section of one of the pistons of the power-cylinders, the piston-rod appearing in side elevation; and Fig. 8 is a side elevation of the same, the piston-rod appearing in transverse section.

A A are the two valve-chests of the motor, each provided at its top with an inlet-port, to which is connected a pipe B, leading from the water-supply and at its bottom with an outlet-port C in alignment with the inlet-port, as shown best in Fig. 4 of the drawings. At one side of each of the valve-chests is formed a power-cylinder D, which cylinders face each other, and in each of them is fitted a piston E, secured to the ends of a power-rod F. On the power-rod F are secured arms *f*, which as the rod reciprocates are adapted to come in contact with collars *h* on a rod H, movable longitudinally above the power-rod, as shown in Figs. 1 and 3 of the drawings.

In each of the valve-chests A is mounted

on a central shaft G' an oscillating valve G, provided with upper and lower curved wings *g* and *g'*, which extend toward each other and are adapted to alternately open and close the inlet and outlet ports of the valve-chests. Upon the outer end of the shaft of the left-hand valve G is mounted a crank-lever I, the lower end of which is connected by a rod I' with a crank-lever I², mounted on the outer end of the shaft of the right-hand valve G, so that as one valve is actuated the other valve is simultaneously operated.

To the upper ends of the crank-levers I and I² are pivoted casings K', into which enter the ends of the rod H above mentioned, and upon the ends of said rod are coiled springs K, having a bearing between stops or collars on the extremities of said rod and the inner ends of the casings.

The crank-levers are alternately locked to hold the valves temporarily stationary by means of spring-catches J, secured at their outer ends to the exterior of the valve-chests and having notches *j* between their extremities, adapted to engage pins *j'*, formed on or secured in any proper manner to the crank-levers near their centers. Said spring-catches are adapted to be disengaged from the pins of the crank-levers by the contact with their downwardly-curved inner ends *k'* of trips *k*, secured upon the above-mentioned rod H.

M is a pump, which in this instance utilizes the power of the motor for raising water, and may be a common double-acting deck-pump. The cylinder of the pump corresponds in length to the length of the stroke of the pistons of the power-cylinders, and the power-rod F, which passes directly through the pump-cylinder, is provided within the same with a piston M' of less area than that of the pistons of the power-cylinders. I desire it to be understood, however, that I do not limit myself to the application of the motor to a pump, as it may be employed for operating various machines and for various purposes.

The operation of the motor is as follows: The parts being in the position shown in Figs. 1 and 4, a slight movement of the rod H farther to the left by the contact of the left-hand arm *f* on the power-rod F with the left-hand collar *h* on the rod H causes the left-

hand trip *k* on said rod to engage with the end *k'* of the left-hand spring-catch *J* and depress the same, thus releasing the crank-lever *I*. Thereupon the spring *K*, previously under compression in the right-hand cylinder *K'*, reacts, causing said cylinder to move to the left, and by reason of the connection of the casings *K'* with the crank-levers *I* and *I*² and the connection of said levers with each other causes the valves *E* to turn in the direction of the arrows shown in connection therewith in Fig. 4, so as to close the inlet and open the outlet port of the right-hand valve-chest and permit its contents to be suddenly discharged and simultaneously close the outlet and open the inlet port of the left-hand valve-chest, the inlet of water to such valve-chest acting to force the power-rod and its pistons to the right. At this time the right-hand arm *f* on the power-rod *F* engages the right-hand collar *h* on the rod *H* and forces said rod farther to the right, thus compressing the left-hand spring *K* in its casing. As these movements of the rods *F* and *H* and the valves *E* take place, the notch of the right-hand spring-catch *J* engages the pin *j'* of the crank-lever *I*², and the valves are thus temporarily locked in stationary position in their chests. The movement of the rods *F* and *H* to the right continues until the right-hand trip *k* on the rod *H* engages and depresses the right-hand spring-catch *J*, whereupon a reverse action takes place, and these alternate actions continuing the pump or other machine to which the motor is applied is continuously operated.

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

1. In a motor, the combination, with oppositely arranged and spaced valve-chests and opposing cylinders at one side of the valve-chest, of spring-actuated valves in the valve-chests, means for alternately locking the valves stationary, pistons in the cylinders, a power-rod connecting the pistons, and means for releasing the valves, substantially as described.

2. In a motor, the combination, with oppositely arranged and spaced valve-chests and opposing cylinders at one side of the valve-chests, of spring-actuated oscillating valves in the said chests, means for alternately locking the valves stationary, a connection between the valves, pistons in the cylinders, a power-rod connecting the pistons, and means for releasing the valves from the power-rod, substantially as described.

3. In a water-motor, the combination, with oppositely arranged and spaced valve-chests, opposing cylinders at one side of the said chests, pistons in the cylinders, and a power-rod connecting the pistons, of oscillating valves in the chests, a spring-pressed and longitudinally-movable rod connected with the said valves, means for alternately locking the

valves stationary, and mechanism between the said longitudinally-movable rod and the power-rod for operating the said longitudinally-movable rod to release the valves, substantially as described.

4. In a water-motor, the combination, with oppositely arranged and spaced valve-chests, opposing cylinders at one side of the chests, pistons in the cylinders, and a power-rod connecting the pistons, of oscillating valves in the chests, a spring-pressed and longitudinally-movable rod connected with the said valves and operated from the power-rod, spring-catches for temporarily locking the valves, and means for operating the said catches from the spring-pressed rod, substantially as described.

5. In a motor, the combination, with oppositely arranged and spaced valve-chests and opposing cylinders at one side of the valve-chests, of pistons in the cylinders, a power-rod connecting the pistons, oscillating valves in the chests, crank-levers connected with the valves, a spring-pressed rod connected with the upper ends of the crank-levers, a rod connecting the lower ends of the said crank-levers together, catches for engaging the crank-levers, and means for operating the catches from the spring-pressed rod, substantially as described.

6. In a water motor or engine, the combination, with two opposing valve-chests having aligning inlet and outlet ports, of oscillating valves in the valve-chests, having curved opposing wings, crank-levers on the shafts of the valves, connected with each other at their lower ends, spring-catches for the crank-levers, casings pivoted to the upper ends of the crank-levers, and a rod entering the casings and provided therein with springs and carrying trips adapted to engage the catches for the crank-levers, substantially as shown and described.

7. In a water motor or engine, the combination, with two opposing valve-chests having aligning inlet and outlet ports and opposing horizontal power-cylinders at one side of the valve-chests, reciprocating rotary valves in the chests, having curved opposing wings, pistons in the power-cylinders, and a rod connecting the pistons and carrying arms near its ends, of crank-levers on the shafts of the valves and connected with each other at their lower ends, spring-catches for the crank-levers, casings pivoted to the upper ends of the crank-levers, and a rod entering the casings and provided therein with springs and carrying trips adapted to engage the catches for the crank-levers, and collars adapted to be engaged by the arms on the piston-rod, substantially as shown and described.

BENJAMIN S. PARTRIDGE.

Witnesses:

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G. R. DARE.