(No Model.) 2 Sheets—Sheet 1.

S. B. GOFF.

WATER MOTOR.

No. 457,194. Patented Aug. 4, 1891.

Fig. 1.

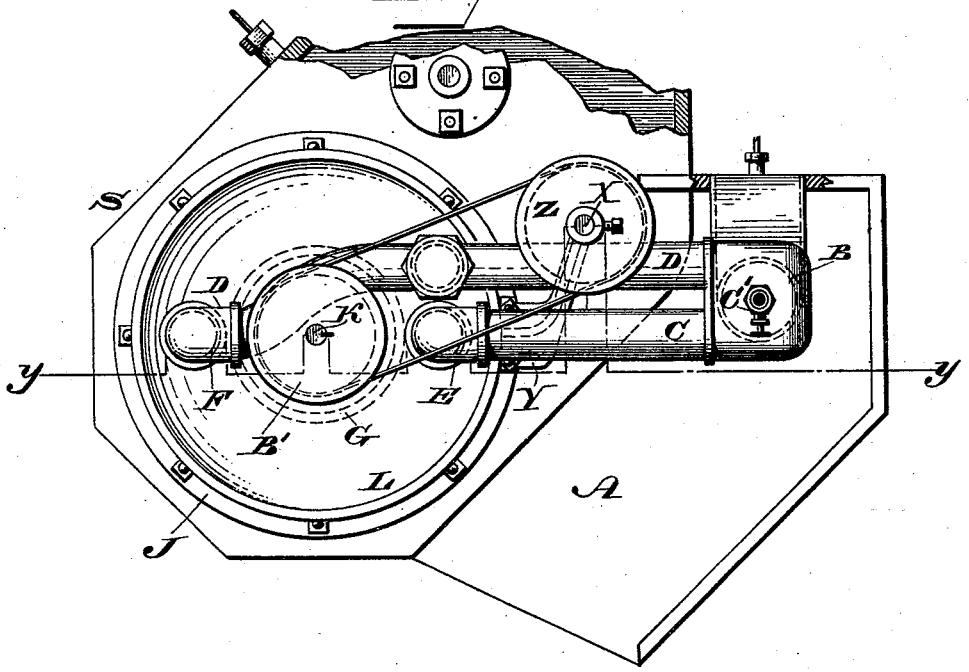
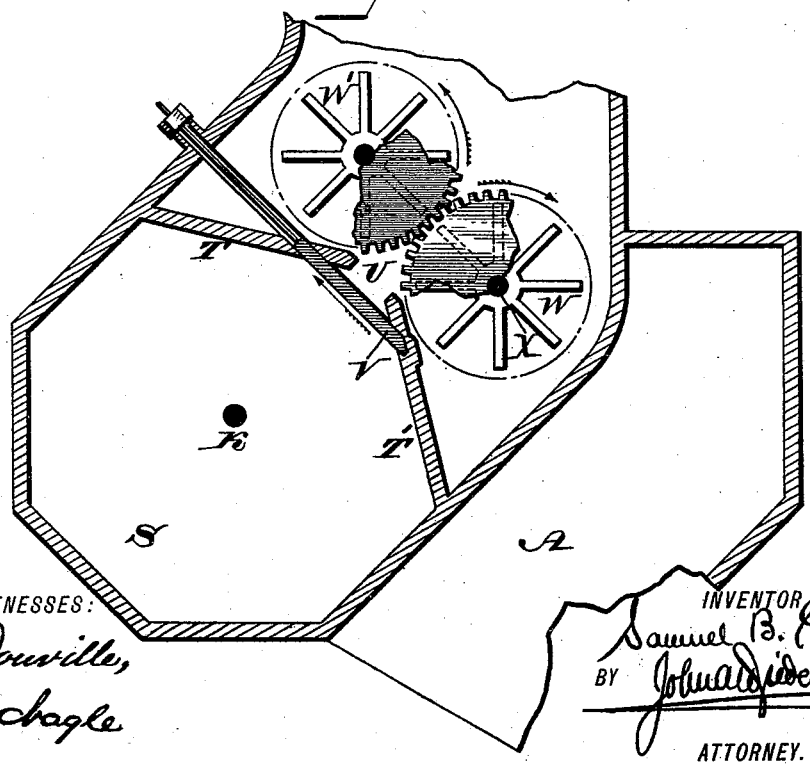


Fig. 2.



WITNESSES:

L. Douville,

P. A. Eagle

INVENTOR

Samuel B. Goff.

BY Johnson & Sherman

ATTORNEY.

(No Model.) 2 Sheets—Sheet 2.

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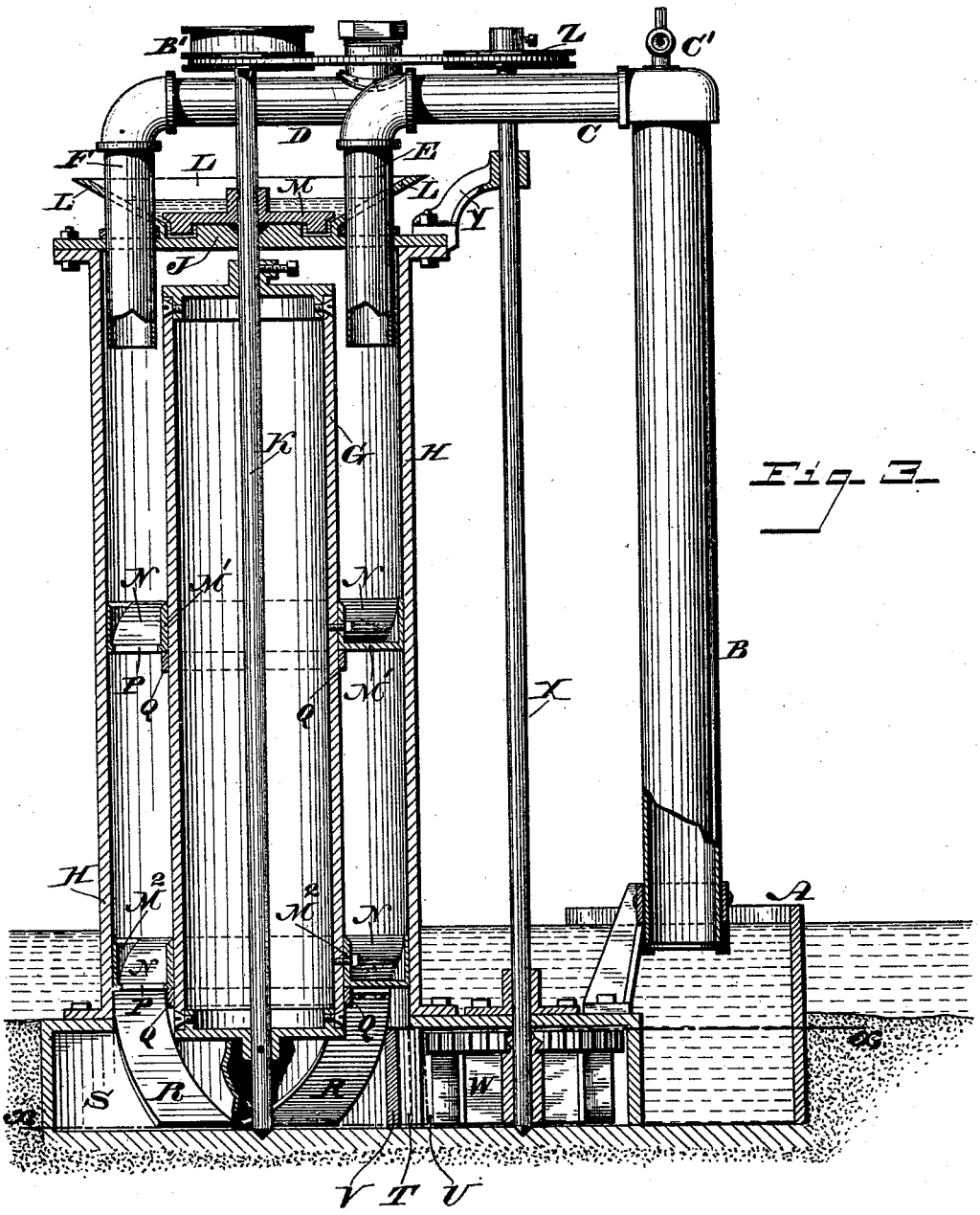

Fig. 3.

WITNESSES:

L. Douville,

P. F. Eagle

Samuel B. Goff INVENTOR

BY John A. Wiedersheim

ATTORNEY.

UNITED STATES PATENT OFFICE.

SAMUEL B. GOFF, OF CAMDEN, NEW JERSEY.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 457,194, dated August 4, 1891.

Application filed November 11, 1890. Serial No. 371,078. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL B. GOFF, a citizen of the United States, residing in the city and county of Camden, State of New Jersey, have invented a new and useful Improvement in Water-Motors, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in water-motors; and it consists of the combination of parts, as hereinafter described and claimed.

Figure 1 represents a plan view of a motor embodying my invention. Fig. 2 represents a horizontal section on line *x x*, Fig. 3. Fig. 3 represents a partial side and partial vertical sectional view on line *y y*, Fig. 1.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings, A designates a race or other suitable water-supply, having therein the lower end of a vertical tube or pipe B, which forms one limb of a siphon, hereinafter fully explained. Connected with the said tube B are the two horizontal tubes or pipes C D, each of which is connected with one of the vertical tubes E F, respectively, leading to opposite sides of a rotatable cylinder or drum G, vertically adjustable on its shaft within a casing H. On the said casing is tightly secured a cap J, through which the said tubes E and F enter the casing. The shaft or axle K of the cylinder G has a suitable bearing at its lower end in the floor or bed of the device and at its upper end in the cap J, the said upper bearing having a stuffing-box formed of a flanged rim L on the cap J and filled with a liquid and provided with a plate M therein, the latter secured to the cap J.

On the cylinder G are secured the annular boxes M′ M², in which the inclosed plates N N are fastened, the said boxes having openings P at the base of the blades for the escape of the falling water. For strengthening the connections of the said boxes with the cylinder G the collars Q are secured to the latter and have the said boxes resting thereon. To the lower one of the said boxes are secured the blades R, which extend into a casing S, which is substantially a widened portion of the casing H below the lower end of the tube B.

Within the casing S are two inclined walls T T′, forming a throat or outlet U, through which the water escapes, and which has a gate V for closing the same. In the outer portion of the casing S are journaled two wheels W W′, having perpendicular blades and provided with gear-wheels meshing together for rotating said wheels in unison. One of the said wheels, as W, has its shaft X extending above the casing S and provided with a bearing Y, secured to the cap J of the casing H. On the said shaft X is mounted a pulley Z, having a band-connection with a pulley B′ on the shaft K of the cylinder G. The upper end of the tube B, at its connection with the tubes C and D, is provided with a pump or valve C′, for exhausting the air in said tubes when desired.

It will be noticed that owing to the opening at the lower end of the tube B being on a higher level than the discharge-throat of the casing S, and, as the connections of the tubes B, C, D, E, and F and the casings H and S are formed air-tight, these parts form a siphon, whereby the water is automatically raised from the bed or race and caused to drop upon the wheels, thereby avoiding extra mechanism for raising the water.

The operation of the device is as follows: The blades of the cylinder G being at rest and the gate V closed the air in the tubes B, C, and D is exhausted, thus causing the water in the race A to rise in the pipe B and flow through the tubes C and D to the tubes E and F and into the casings H and S, when the gate V is opened, permitting its escape through the throat U and then between the wheels W W′, rotating the same. As the water, passing through the casing H, comes in contact with the blades N N, it causes the boxes M′ M² and the cylinder G, with which they are connected, to rotate, so that the shaft K, with the pulley B′ thereon, operates the shaft X and thereby the wheels W W′, the said wheels being also aided in their rotation by the contact of the water therewith as it escapes from the throat U. Power for operating any mechanism may be taken either from the shaft K or the shaft X, as desired.

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

1. A water-motor having a race, a vertical

tube B leading therefrom, horizontal pipes connected with the upper end of said tube, the tubes E F, connected with said horizontal pipes, a casing with a rotatable cylinder therein, having boxes connected with its sides, with blades therein, the said tubes E F leading into said casing on opposite sides of said cylinder, said parts being combined substantially as described.

2. The combination of a water-race, the vertical tube B leading therefrom, horizontal pipes connected with the upper end of said tube, the tubes E F, connected with said pipes, a casing having a cap J, with a flanged rim and a plate therein, a cylinder journaled in said casing and having collars secured thereto, boxes on said collars, and blades in said boxes, the inclined walls T T′ forming a throat, and a gate for said throat, substantially as described.

3. The combination of a water-race, a vertical tube B leading therefrom, horizontal pipes connected with the upper end of said tube, the tubes E F, a casing having a cylinder journaled therein and provided with blades secured to its periphery, inclined walls forming a throat, and a gate therefor, the lower end of the tube B being on a higher plane than the lower end of the casing, so as to form a siphon, substantially as and for the purpose described.

4. The combination of a water-race, a tube leading upward therefrom and connected with a casing, a cylinder journaled in said casing and provided with blades, a discharge-opening in said casing below the lower end of the said tube, a gate closing said opening, and wheels on the outer side of said opening, having perpendicular blades and meshing gearing, substantially as and for the purpose described.

5. The combination of a water-race, the vertical tube B leading therefrom, the pipes C D, connected with the said tube, the tubes E F, connected with the said pipes, a casing with a rotary cylinder therein, said tubes E F leading into said casing on opposite sides of said cylinder, blades secured to said cylinder, said casing having a widened lower portion, with inclined walls forming a throat, a gate for said throat, wheels with meshing gearing, and perpendicular blades at the outer side of the throat, substantially as described.

SAMUEL B. GOFF.

Witnesses:
JOHN A. WIEDERSHEIM,
A. P. JENNINGS.