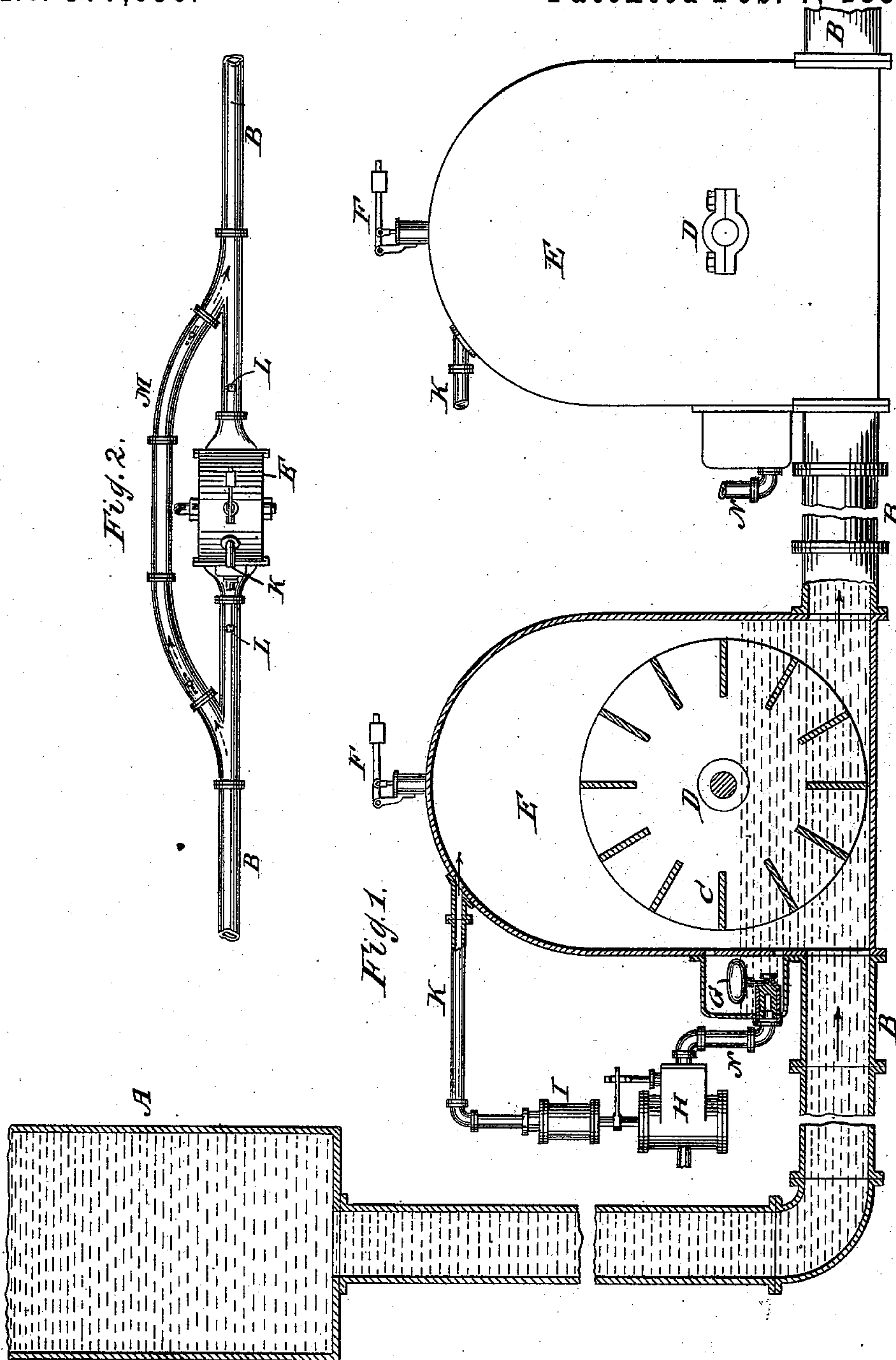


(No Model.)

C. G. OTIS.
HYDRAULIC MOTOR.

No. 377,636.

Patented Feb. 7, 1888.



WITNESSES:

Eduard Wolff.
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CHARLES G. OTIS, OF BROOKLYN, NEW YORK.

HYDRAULIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 377,636, dated February 7, 1888.

Application filed August 18, 1887. Serial No. 247,290. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. OTIS, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Hydraulic Motors, of which the following is a specification.

This invention relates to improvements in hydraulic motors, as set forth in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, of a conduit. Fig. 2 is a detail plan view of a casing and a cut-out on a smaller scale than Fig. 1.

Similar letters indicate corresponding parts.

In the drawings, the letter A indicates a receiver or tank from which water or fluid passes through the conduit B. A motor-wheel actuator or motor, C, is located in said conduit. Said wheel is shown in the form of a bucket-wheel, and is journaled at D, and a casing, E, partly surrounds said wheel. The shaft or axle of the wheel extends through said casing at D. A safety-valve, F, closes the space in the case or air-chamber E.

G is a float-valve, and as the level of the fluid rises in the air-chamber the float is actuated so as to open the valve and allow fluid to pass through the pipe N to the cylinder H of the air-compressor or the air-pumping engine I. Said compressor is thus actuated and forces air through the pipe K into the air-chamber E.

The device operates as follows: The water flowing through the conduit B actuates the wheel C. To secure efficient action of the fluid on the wheel, the fluid should not be allowed to rise above the shaft or axle of the wheel. The compression of air in the chamber or case E usually prevents such excessive rise of the fluid. In case the fluid should rise beyond its proper level, such rise of the fluid will actuate the float-valve G so as to open the passage N. Fluid will then pass through said passage N into the cylinder H, so as to actuate the piston in said cylinder, whereby the air-compressor I will be set in motion, and air will be forced through the passage K into the air chamber or case E until the pressure of air in said case has forced the fluid down to its proper level. As the fluid descends the valve G grad-

ually closes, and when the fluid has reached its proper level the valve G closes the passage N and the air-compressor I ceases to operate.

In the drawings are shown a series of air chambers or casings E. For each casing is arranged a cut-out, M. By closing the valves or gates L, Fig. 2, the fluid is caused to pass through the cut-out M, and the casing E is then free to be cleaned or otherwise attended to, as may be required.

It will be seen that by this invention I am enabled to run an undershot wheel in a chamber which contains air under pressure and is sealed by the liquid that actuates the wheel.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a hydraulic motor, the combination of a conduit containing water under pressure higher than the atmospheric pressure, an air-chamber containing air under pressure equal to the pressure of the water in the conduit and lower part of said chamber, a shaft extending horizontally through the air-chamber at the level of the water, a vertical bucket-wheel mounted on said shaft, and an air-pumping engine communicating with the air-chamber, substantially as described.

2. The combination, with the conduit containing water under pressure higher than the atmospheric pressure, and with an air-chamber connected to the conduit and containing air under pressure equal to the pressure of the water in the conduit, of an air-pumping engine, a pipe extending from said air-chamber into the air-pumping engine and through which power is transmitted to said engine, and a valve for admitting water to this pipe, substantially as described.

3. The combination, with the conduit containing water under pressure higher than the atmospheric pressure, and with an air-chamber connected to the conduit and containing air under a pressure equal to the pressure of the water in the conduit, of an air-pumping engine, a pipe extending from said engine into the air-chamber, a pipe extending from said air-chamber into the air-pumping engine and through which power is transmitted to said engine, and a valve for admitting water to this pipe, and a float for controlling the position of this valve, substantially as described.

4. The combination of a conduit containing
water under pressure higher than the atmos-
pheric pressure, a series of air-chambers com-
municating with said conduit and containing
5 air under a pressure equal to the pressure of
the water in the conduit, water-wheels mounted
in said chambers, pumping-engines commu-
nicating with the air-chambers through pas-
sages sealed by the water in the lower part of
10 said chambers, and cut-out pipes extended

around said chambers and connected with the
conduit at each end, substantially as described.

In testimony whereof I have hereunto set
my hand and seal in the presence of two sub-
scribing witnesses.

CHARLES G. OTIS. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.