A. SCHMID.

Hydraulic-Motor.

No. 165,879. Patented July 20, 1875.

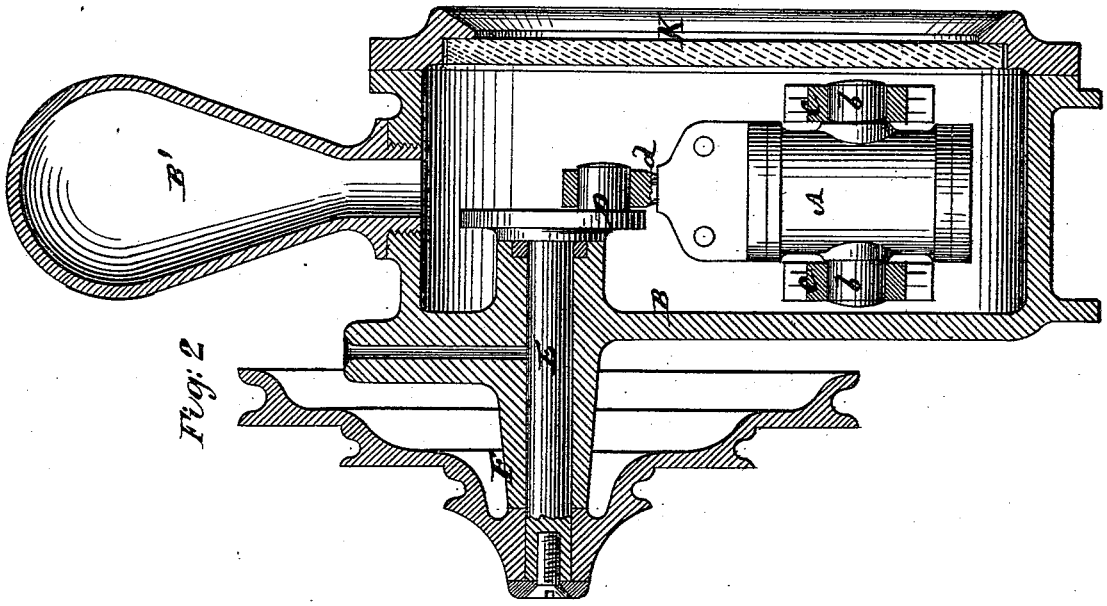

Fig. 2

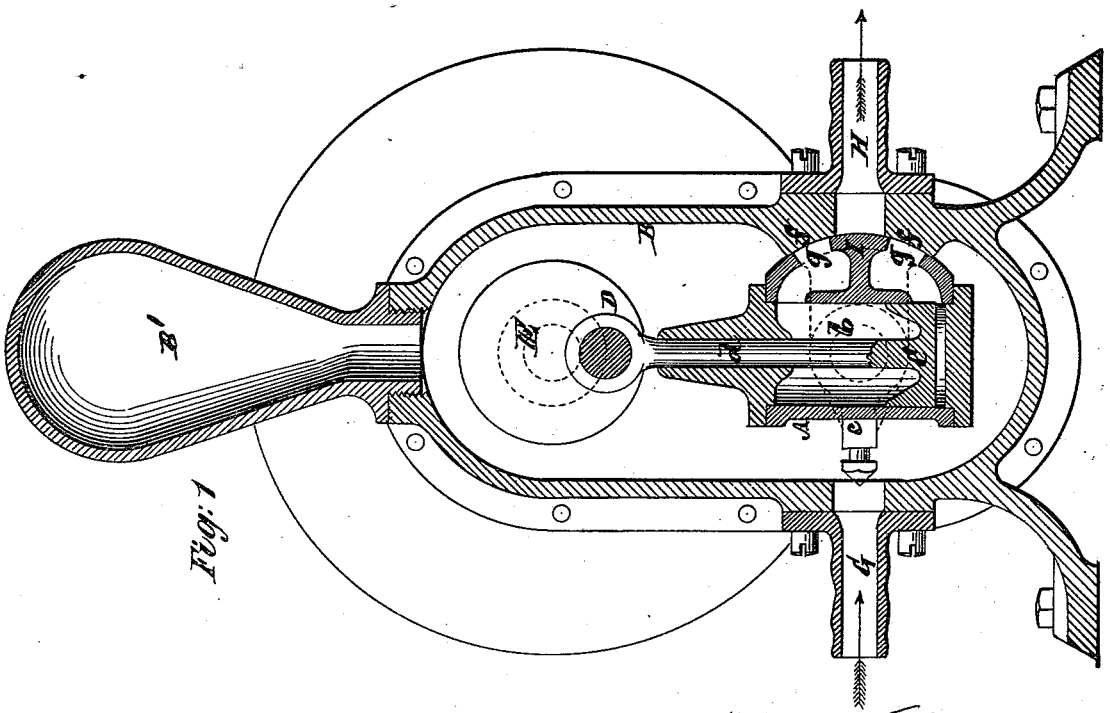

Fig. 1

Witnesses:
Michael Ryan
Fred Haynes

Albert Schmid
by his Attorneys
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UNITED STATES PATENT OFFICE.

ALBERT SCHMID, OF ZURICH, SWITZERLAND.

IMPROVEMENT IN HYDRAULIC MOTORS.

Specification forming part of Letters Patent No. **165,879**, dated July 20, 1875; application filed May 4, 1875.

To all whom it may concern:

Be it known that I, ALBERT SCHMID, of Zurich, Switzerland, have invented a new and useful Improvement in Hydraulic Motors; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figures 1 and 2 represent sectional elevations, at right angles to each other, of a hydraulic motor, having my improvement applied.

This invention, like my former invention, for which Letters Patent No. 124,162 were issued February 27, 1872, relates to that class of engines or motors in which there is an oscillating cylinder moving on trunnions, and formed with a convex slide-face, the curve of which is struck from the center line of the trunnions, and forms the segment of a cylinder. This curved slide-face rests and fits accurately upon a stationary concave supporting-surface, which also forms the segment of a hollow cylinder, and contains three ports or openings communicating alternately with two ports or passages in the convex slide-face of the cylinder during the oscillation or rocking of the latter, the said two ports opening into the opposite end of the said cylinder. Said engine or motor may also be constructed in other respects similar to that described in my said former Letters Patent.

The invention consists in a combination, with an engine or motor of the description just referred to, of a close box or casing, in which the engine or motor is inclosed, and on or in which the engine is mounted, said casing being provided with an inlet and an outlet for the fluid being worked, or which works the engine, whereby the latter is wholly submerged in the fluid within the case, and the case forms an air-vessel or pressure-reservoir to control the flow of the fluid into the inlet.

The motor may be used either to transmit power to any other machinery, or it may be driven by an outside driver, accordingly as it is required to be used as a prime mover, or as a pump, or as a water-meter.

When used as a water-meter, duplicate motors may be inclosed in the same close box or case. Furthermore, compressed air or steam may be used as the propelling agent when the motor is a prime mover.

It will suffice here, however, to describe the invention as a single hydraulic engine or motor driven by water.

In the drawing, A is the oscillating cylinder of the engine or motor, and *b b* its trunnions, which are carried by brackets *c c* on the interior of the close box or casing B, in which the engine is inclosed. C is the piston of the engine, and *d* its rod, which gives motion to a crank, D, of a shaft, E. This shaft E works through a packed sleeve, F, attached to or forming part of the casing B, and is provided with a fly-wheel and driving pulley or pulleys, or either. G is the inlet for water to the casing B, and H its outlet. The side of the casing B on which is the outlet H is constructed internally with a concave face, *f f*, forming a segment of a hollow cylinder, perforated by the outlet H, and the upper and lower spaces of the casing B immediately above and below the concave face *f f*, forming passages for the ingress of water alternately to the upper and lower ends of the cylinder as the latter is oscillated, and its convex slide-face I brings its passages *g g* alternately in communication with said passages, and with the exhaust H, to reciprocate the piston within the cylinder, as in my former patent, hereinbefore referred to.

The box or casing B is closed in front by a stout glazed face or cover, K, which admits of ready inspection of the engine from the exterior, and is secured by screw-bolts to the main body of the casing, to allow of free access to the latter for insertion, removal, or repair of the engine.

The close box or casing B not only serves to protect the engine, and, by submersion of the latter under the water in the casing, does away with objections consequent on leakage, as well as insuring lubrication of the working parts, but the casing B, on which may be mounted an air-vessel proper, B′, and which forms a reservoir for the fluid, constitutes an air-chamber, by the compression of the air consequent on the admission of the water to

the casing B by the inlet G, and so to regulate or make uniform the flow of water into the inlet.

I claim—

The oscillating cylinder A, having the convex slide-face I, provided with ports or passages *g g*, in combination with the closed box or casing B, constructed with the inlet and outlet passages G and H, and the internal concave face *f f*, through which the outlet-passage H passes, and communicates with the oscillating cylinder by the ports *g*, substantially as shown and described.

A. SCHMID.

Witnesses:
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E. BÜRGIN.