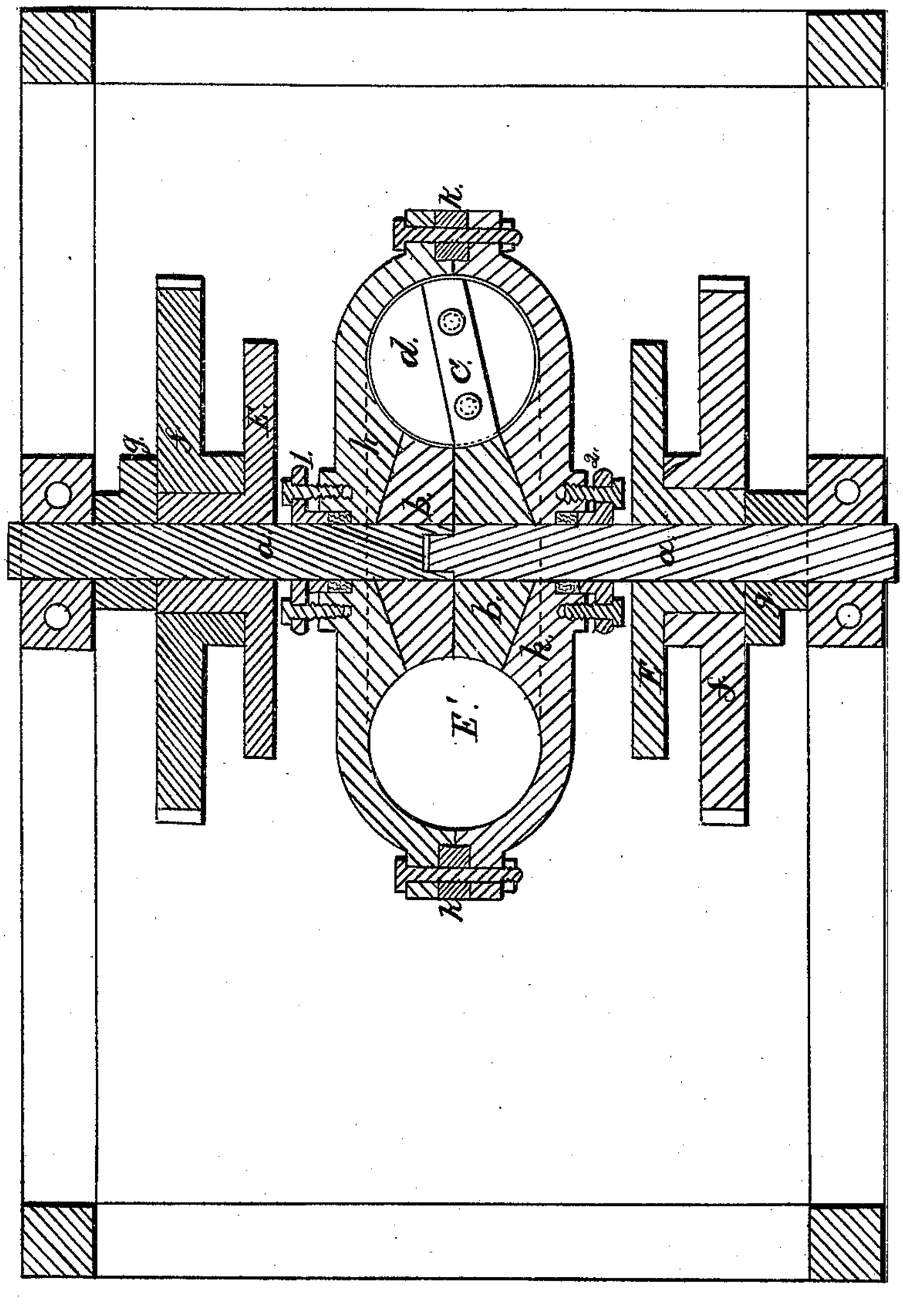
4 Sheets. Sheet 1.

E. Offhaus,

Hydraulic Propeller.

No. 80,497. Patented July 28, 1868.

Fig. 1



Witnesses.

Chas. H. Smith

Geo. T. Pinckney.

Inventor.

Ernst Offhaus

per L. W. Seward Atty

4 Sheets. Sheet 2.

E. Offhaus,

Hydraulic Proneller.

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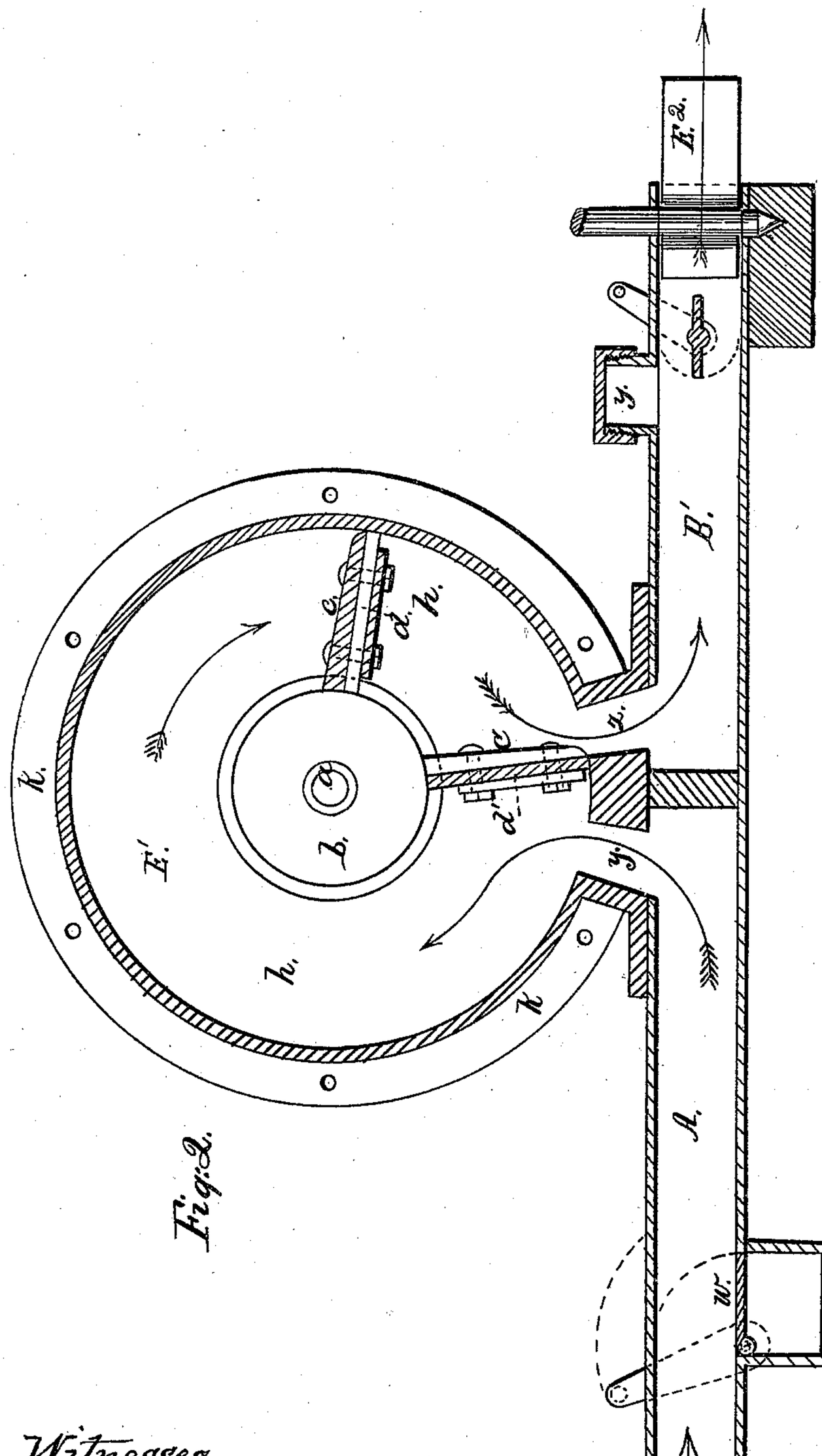

Fig. 2.

Witnesses.

Chas. H. Smith

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Inventor.

Ernst Offhaus

per L. W. Seull

Atty.

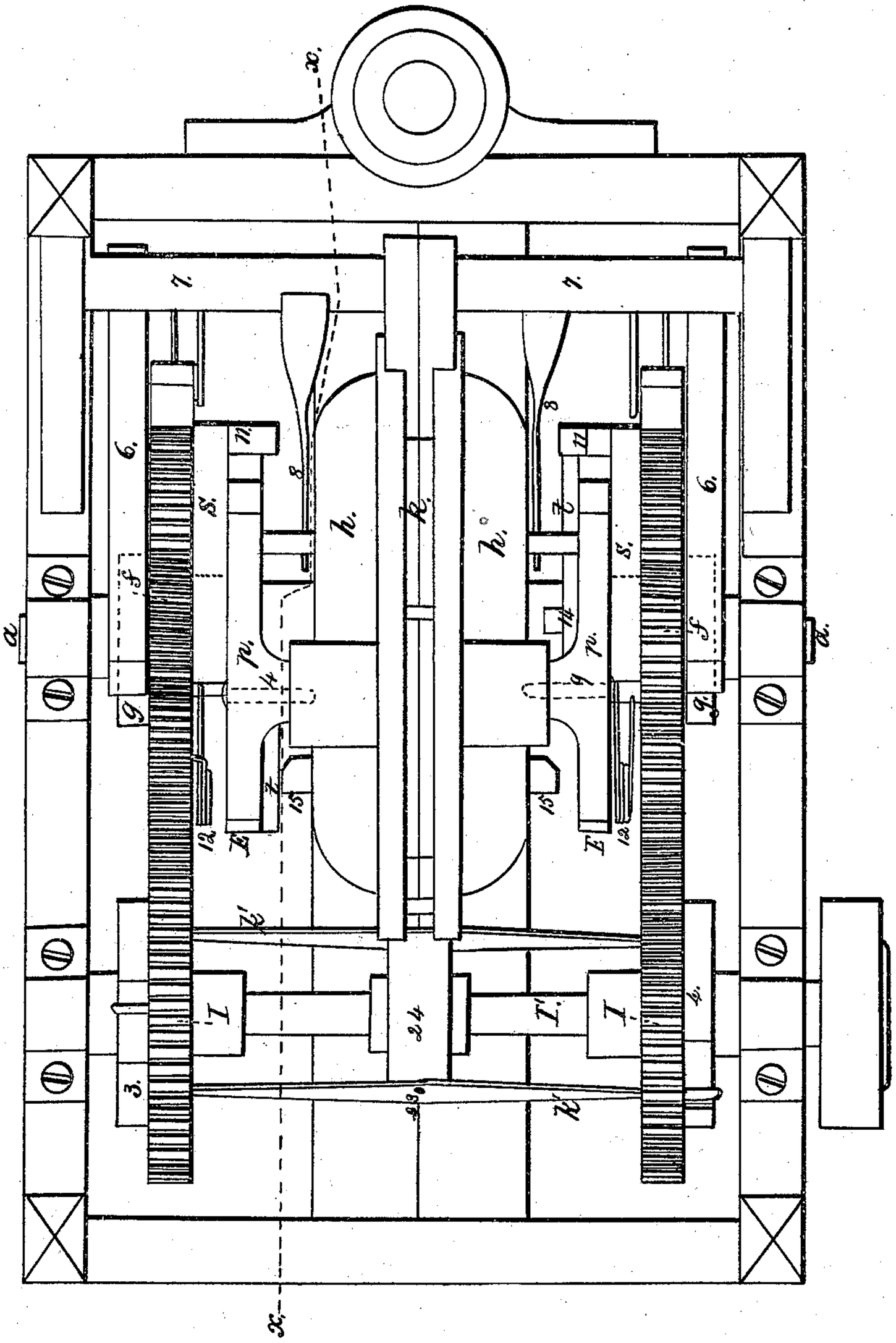
4 Sheets. Sheet 3.

E. Offhaus,

Hydraulic Propeller

No. 80,497. Patented July 28, 1868.

Fig. 3.



Witnesses.

Chas. H. Smith

Geo. C. Pinckney.

Inventor.

Ernst Offhaus

per L. McPherson Atty

4 Sheets. Sheet 4.

E. Offhaus,

Hydraulic Propeller

No. 80,497. Patented July 28, 1868.

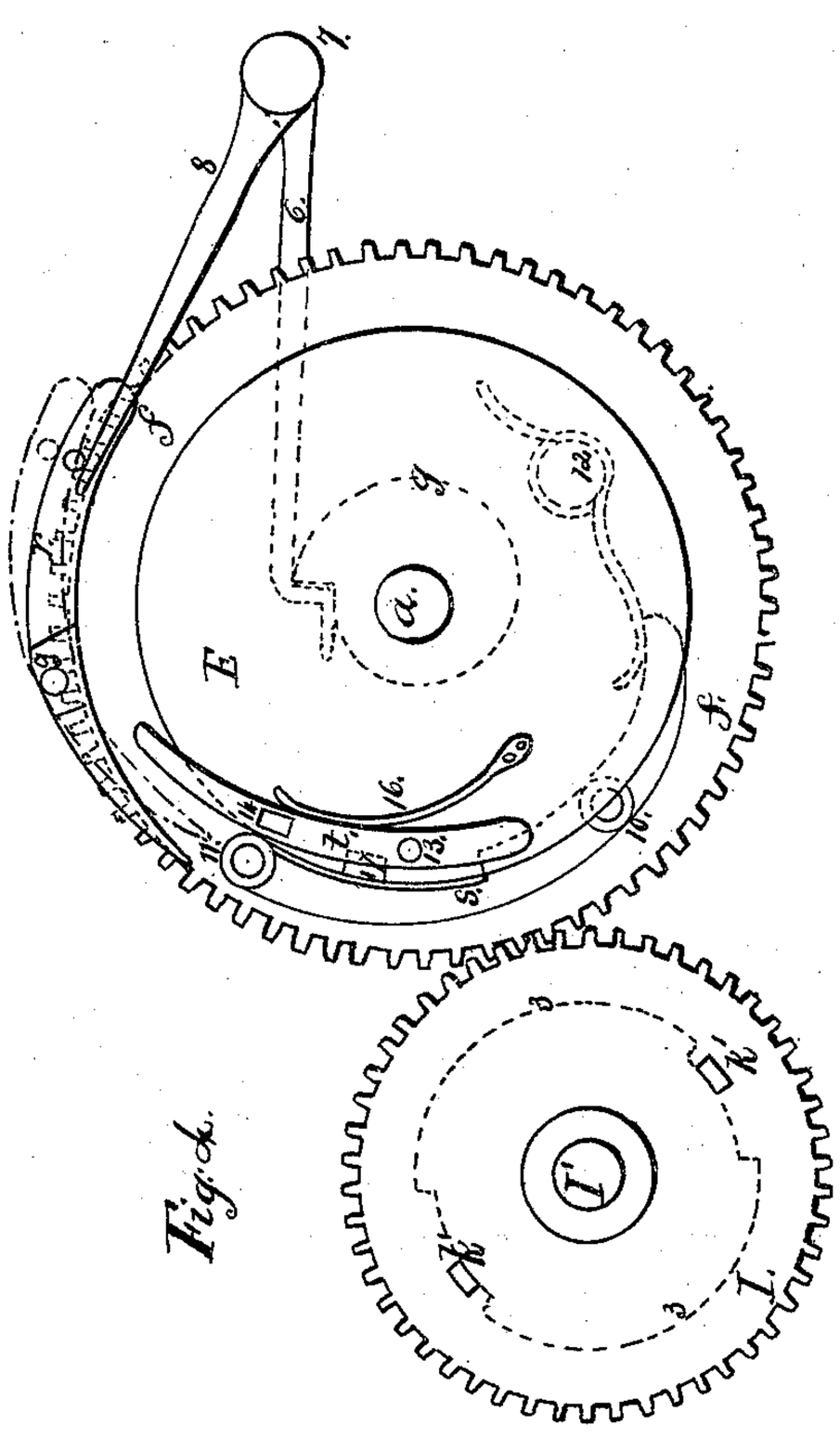


Fig. 4.

Witnesses.

Chr. H. Smith

Geo. T. Pinckney

Inventor.

Ernst. Offhaus

per L. W. Sewell Atty.

United States Patent Office.

ERNST OFFHAUS, OF NEWARK, NEW JERSEY.

Letters Patent No. 80,497, *dated July* 28, 1868.

IMPROVEMENT IN PROPELLING-APPARATUS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ERNST OFFHAUS, of Newark, in the county of Essex, and State of New Jersey, have invented and made a certain Improvement in Propellers for Vessels; and I do hereby declare the following to be a correct description of the same, reference being had to the annexed drawings, making part of this specification, wherein—

Figure 1 is a sectional plan of my said apparatus.

Figure 2 is a vertical section of the same through the pump.

Figure 3 is a general plan of the apparatus complete; and

Figure 4 is a section, at the line *x x*, of the parts for locking and unlocking the piston.

Similar letters of reference denote the same parts.

This invention consists in a peculiar arrangement of mechanism for operating two pistons in a rotary pump that draws in water from the front part of the vessel, and forces it out at the back, so as to propel the vessel by the action of the water.

In the rotary pump, one piston remains stationary as an abutment, while the other revolves, then the second piston remains stationary while the first revolves, and so on.

In the drawing, *a* is a divided shaft, supported in a suitable frame, the inner ends passing through the stuffing-boxes 1 2, fig. 1, into the circular pump, that is formed of two shells, *h h*, bolted and made water-tight by packing between the flanges at *k*.

At the inner ends of the divided shaft *a* the cones *b b* are attached permanently, and from these cones the arms *c c* project, that carry the pistons *d d'*, that fit the annular cylinder E', forming the water-way or pump between the shells *h*.

A is a trunk, to let in water from the front part of the vessel, and this may extend to the bows or be turned down and out through the bottom of the vessel.

The exit-trunk B' extends to the back or stern of the vessel, and in this the rudder E² should be placed, in order that the water, in passing away, may be directed either one way or the other, and aid in steering the vessel.

The water passes by the port *y* from the trunk A into the annular cylinder E', and is ejected through the port *z*, the piston *d'* remaining stationary while the piston *d* is revolved in the direction of the arrow, and then the piston *d* remains stationary while the piston *d'* revolves.

In order to give the proper motions to the shafts *a a* and their pistons, I employ the following means:

E E are disks, secured firmly upon the respective shafts *a a*. Upon the hubs of these disks E E are the gear-wheels, *f f*, that are loose. The wheels *f* gear to the wheels I, that are upon the shaft I', that is revolved by competent power.

3 and 4 are disks keyed fast to the shaft I', in the edges of which are notches, as seen in figs. 3 and 4, and in these are pins or projections from the wheels I, and these wheels I are loose upon the shaft I', and lever-bars, *k'*, upon the fulcra 23 in the hub 24, pass at their ends into mortises in the wheels I, and the position of the parts is such that when one of the wheels I is turned one way the amount that the notch in 3 will allow of, the levers I turn the other wheel I in the other direction to the same extent.

The parts to lock and unlock the pistons, for holding them, are the same on both sides. I will describe that on one side, reference being had to fig. 4. The wheel *f* carries on its side a lever, *s*, on a fulcrum, 10, with a roller, 11, at one end, kept towards the disk E by the spring 12, and on the disk E is a latch, *t*, on a fulcrum, 13, and having a stud, 14, that is kept in position to come into contact with a stud, 15, (fig. 3,) on the case *h*, and stop the disk E and its connected piston from turning. A spring, 16, is employed to hold this latch *t* in position.

Upon the shaft *a* is the cam *g*, that acts upon the arm 6, rock-shaft 7, and arm 8, that moves the switch *r*, which is upon the stationary fulcrum 9.

The wheel *f* is locked to the disk E by the notch in the lever *s* taking a stud, 17, on E, and the piston *d* is hence revolved by the wheel *f* through the lever *s* and disk E.

This lever *s* and stud 17 are disconnected at the proper moment by the roller 11 on *s* rolling up the inclined switch *r*, the point of which has been turned down by the cam *g* raising the arm 6, (see red lines, fig. 4.) As the lever *s* is disconnected from the stud 17, the stud 14 stops against the stud 15, and the piston *d* is arrested; at the same time the other piston has become unlatched by the action of the bars *k'*, causing the other wheel *f* to travel a little in advance of the one that has been described, and the act of unlatching the studs 14 and 15 is performed as next described.

After the roller 11 has passed up the incline *r*, the cam *g* passes clear of the end of the arm 6, and that drops, and the back end of the switch *r* is depressed by the roller 11, and so remains in the position shown in fig. 4. This is done when the latch *s* is disconnected from the stud 17, and the disk remains stationary, so that when the roller 11 comes around again (the cam *g* remaining stationary) the roller 11 passes under the switch *r*, depressing the lever *t*, disconnecting 14 and 15, and at the same moment the notch in the lever *s* takes the stud 17, and the wheel *f* moves the disk E and its piston, as before described.

By this arrangement, first one disk E is connected and rotated with its piston while the other stands still, and then the reverse. Thus the disks E are rotated alternately once every two revolutions of the wheels *f*. The trunks A may have a valve at *w*, to close the water-way, and allow the pump to draw up water from the inside of the vessel in case of leakage, and upon the trunk B' a hose for fires might be screwed at *y*.

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

The annular cylinder E', connected to the water-ways A and B', and receiving the pistons *d d'*, in combination with the levers *s* and *t*, switch *r*, and stops, acting in the manner and for the purposes specified.

ERNST OFFHAUS.

Witnesses:

EDWARD LOCHER,

CHRISTIAN SCHWARTZ.