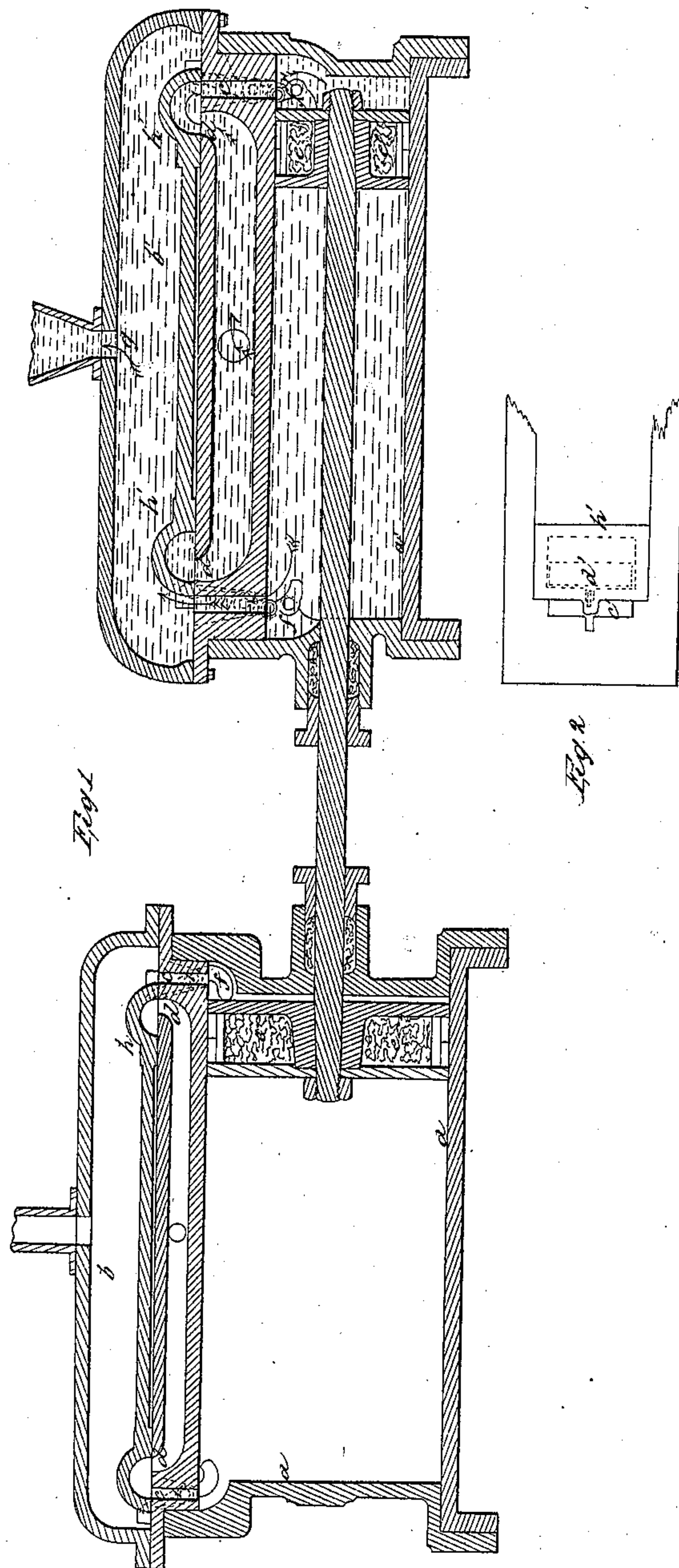


*Braidwood & Whiting,
Steam Pump.*

No 31,139.

Patented Jan. 15, 1861.



*Witnesses:
Lemuel W. Lowell.
Chas. W. Barred.*

*Inventors:
Wm. Braidwood,
Richd. Whiting.*

UNITED STATES PATENT OFFICE.

WM. BRAIDWOOD, OF MOUNT VERNON, AND R. WHITING, OF BROOKLYN, NEW YORK,
ASSIGNORS TO THOMAS HOLMES, OF BROOKLYN, NEW YORK.

OPERATING SLIDE-VALVES OF ENGINES AND PUMPS.

Specification of Letters Patent No. 31,139, dated January 15, 1861.

To all whom it may concern:

Be it known that we, WILLIAM BRAIDWOOD, of Mount Vernon, in the county of Westchester, and RICHARD WHITING, of Brooklyn, in the county of Kings, both in the State of New York, have invented, made, and applied to use a certain new and useful Improvement in Means for Operating the Slide-Valves of Engines and Pumps; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is a vertical section of a steam cylinder fitted with our invention and acting to propel a pump, which pump has a valve actuated in the same manner as the steam valve, and Fig. 2 is a plan of the end of one of the valves, and the steam ports.

Similar marks of reference denote the same parts.

Various attempts have been made to construct steam engines and pumps with valves operated by the piston or piston rod so as to dispense with the ordinary connecting rod and crank, especially in water engines where the piston rod of the steam cylinder connects directly to the water piston. We are aware that for this purpose levers have been used both inside and outside the cylinder. When used outside the cylinder, stuffing boxes to the rods have been required that increased the cost of construction and added to the friction. When used within the cylinder said levers have controlled a secondary valve that caused the steam to move the main valve.

The nature of our said invention consists in the combination of direct acting levers with the slide valve, the parts being so constructed that the levers being acted upon by the piston near the termination of each stroke communicate a direct movement to the valve and open the port for the steam or water at one end, and the exhaust port at the other end of the cylinder. Thus all stuffing boxes and secondary valves are dispensed with, the valve itself covering the openings for the levers.

In the drawing *a*, is the steam cylinder, *b*, the steam chest.

c, c, are the steam ports.

d, d, are the eduction ports.

h, is an ordinary D slide valve, adapted to these ports.

f f, are levers on fulcra *l, l*. Each of these levers *f* is fitted in the steam port *c*, and its fulcrum may be on lugs formed on or attached to the cylinder head, or may consist of a pin through said lever sitting into a recess formed for it in the metal between the cylinder and steam chamber. These levers *f f*, being acted on by the piston *e* near the termination of the stroke, give motion to the valve, reversing its position and letting the steam in behind the piston. The levers *f f*, may be extended down farther into the cylinder so as to have more leverage in moving the valve, and in this case the cylinder heads should be countersunk to allow of the movement of said levers. This same cylinder may be used for water if the supply is introduced at the pipe *g*, and passes off by the ports *d, d*. In this case however the valve *h*, will require a device to keep it to the seat. If the levers are made compound as shown at *f', f'*, of the water cylinder *a'*, the water may be introduced at the ports *d', d'*, and go off by the pipe or air vessel *g'*, because the compound levers *f'*, will cause the valve *h'*, to move in the same direction as the piston instead of the reverse, as in the cylinder *a*. In all cases the valve covers the openings that pass the levers.

The simplicity, durability, reliability and cheapness of our device for moving the slide valve will be apparent; and

Having thus described our said invention what we claim and desire to secure by Letters Patent is—

The combination of the direct acting levers (*f* or *f'*) with the slide valve (*h* or *h'*), the parts being constructed as specified so that the valve covers the openings through which the levers pass and renders separate packings or stuffing boxes unnecessary as set forth.

In witness whereof we have hereunto set our signatures this twentieth October 1860.

WM. BRAIDWOOD.
RICHD. WHITING.

Witnesses:

LEMUEL W. SERRELL,
THOS. GEO. HAROLD.