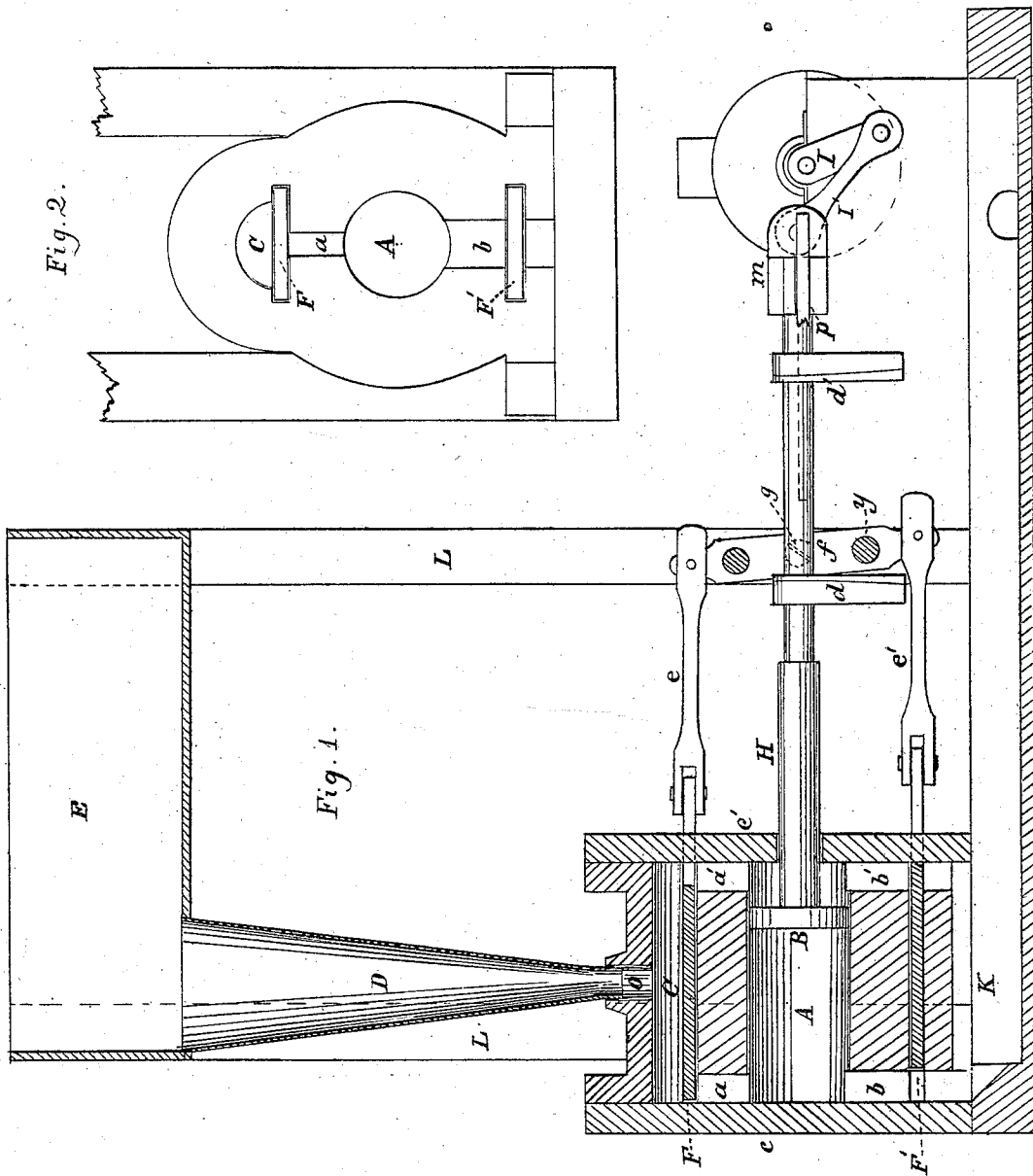


J. C. HODGES.
Hydraulic-Engines.

No. 134,806.

Patented Jan. 14, 1873.



Witnesses :
W. Purris
H. A. Daniel,

Inventor :
James C. Hodges
by Robt A. Lacey
att'y.

UNITED STATES PATENT OFFICE.

JAMES C. HODGES, OF MORRISTOWN, TENNESSEE.

IMPROVEMENT IN HYDRAULIC ENGINES.

Specification forming part of Letters Patent No. 134,806, dated January 14, 1873.

To all whom it may concern:

Be it known that I, JAMES C. HODGES, of Morristown, in the county of Grainger and State of Tennessee, have invented certain new and useful Improvements in Hydraulic Engines; and I do hereby declare that the following is a full, clear, and exact description thereof that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing and to the letters of reference marked thereon which form a part of this specification.

The object of my invention is to produce a cheap, simple, and efficient means whereby the utilization of water as a motive power can be more perfectly secured by its downward pressure in column, through a tube, pipe, funnel, or conduit; and it consists, principally, in the peculiar construction and combination of the tube or water-conduit, cylinder, water-boxes, valves, piston, and other mechanism, as hereinafter more fully described.

In the accompanying drawing, which illustrates my invention and forms a part of the specification thereof—

Figure 1 is a longitudinal sectional view of my invention. Fig. 2 is an end view with the cap *c* removed.

In the said drawing, A designates the cylinder; C, the water-box; B, the piston with the piston-rod H, to which are rigidly attached the blocks *d d'*. D indicates the funnel or water-conduit for conducting the water from the fore-bay or head E to the water-box C, through the aperture O, the engine and appurtenances being supported and held in position by the frame, consisting of the posts L and sills K. The said water-box and cylinder are closed at the ends thereof by the removable caps *c c'*, and just within are the throats or apertures *a a'* and *b b'* for the passage of water, as shown in Fig. 1. F F' indicate the upper and lower valves, operated by the double lever *f*, and connected therewith by the arms *e e'*, the said lever being pivoted at *g* to the posts L. Motion is imparted thereto by the block *d* striking the cross-bar *y* during the oscillatory motion of the piston. The support of the piston-rod H in its oscillations and the attachment of said rod to a crank are secured

by any of the ordinary devices for such purposes.

The operation of my hydraulic engine is as follows: The water, descending through the conduit D, enters the water-box C, and, passing through the throat *a'* into the cylinder A, forces the piston B to the opposite end of the cylinder. The block *d'* is so adjusted that when the piston reaches the opposite end of the cylinder the said block strikes the cross-bar *y*, forcing back the valve F, closing the throat *a'* and opening throat *a*, thereby cutting off the flow of water through *a'* and permitting the flow through *a*. At the same time and by the same means the discharge-throat *b* is closed and *b'* is opened. The water discharges freely through *b'*, and entering the cylinder through *a* forces back the piston to the initial point. The block *d* then, striking the round or cross bar *y*, reverses the position of the valves, opening the throats *a'* and *b*, and closing *a* and *b'*, thus continuing the operation of the engine.

The engine is substantially constructed of any suitable material, either wood or metal. I do not confine myself to any particular length or size of tube or conduit, nor to any particular shape, size, or dimensions of cylinder or water-box, or form of valve.

Having thus described my invention, I claim and desire so secure by Letters Patent—

1. In a hydraulic-engine, the combination of the head or fore-bay E, cylinder A, water-box C, valves F F', double lever *f* having cross-bar *y*, the caps *c c'*, throats *a a'* and *b b'*, the piston B, and piston-rod H having the blocks *d d'*, constructed and operating as described.

2. The combination of the piston B with the cylinder A, water-box C, valves F F', throats *a a'* and *b b'*, as and for the purpose set forth.

3. The combination of the valves F F', arms *e e'*, levers *f*, with cross-bar *y*, blocks *d d'*, and piston-rod H, as herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of November, 1872.

Witnesses: JAMES C. HODGES.
THEODORE F. BROWN,
J. E. CRANE.