J. R. COLE.

Hydraulic-Engine.

No. 226,598. Patented April 20, 1880.

Fig. 1.

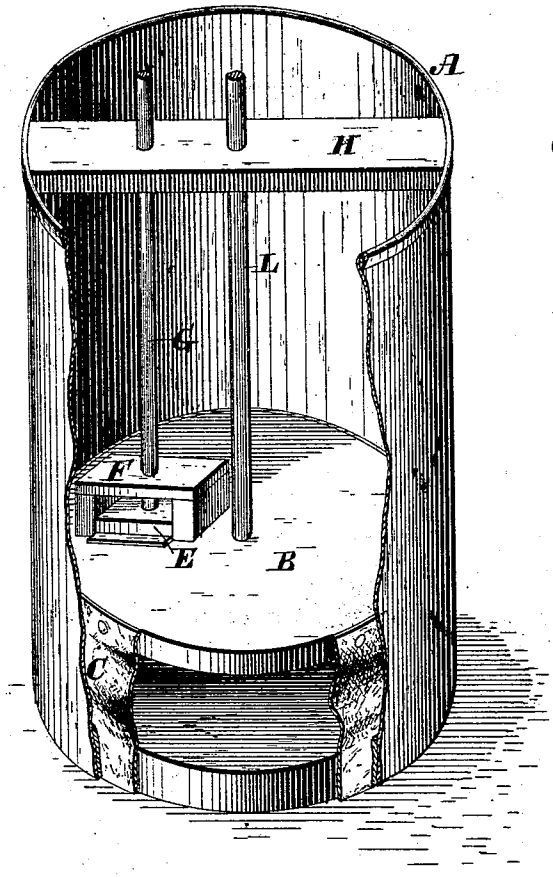
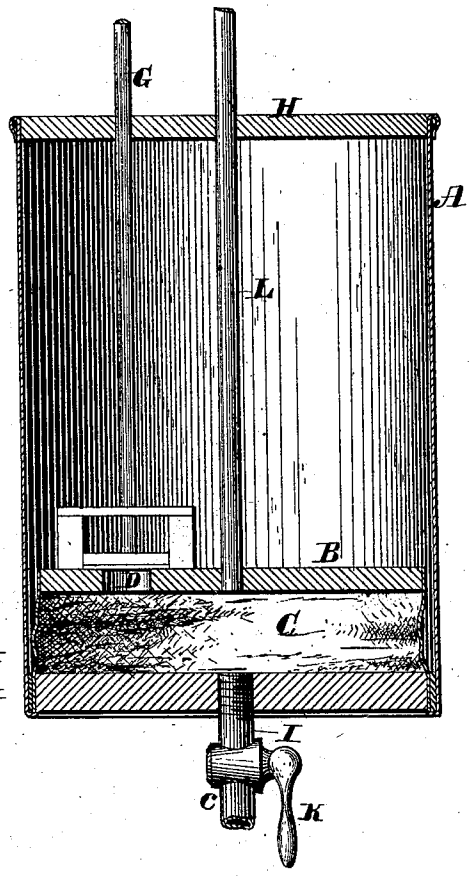


Fig. 2.



Attest

J. Henry Kaiser.

Jas. H. Rumbough.

Inventor:

James R. Cole

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES R. COLE, OF WARM SPRINGS, NORTH CAROLINA.

HYDRAULIC ENGINE.

SPECIFICATION forming part of Letters Patent No. 226,598, dated April 20, 1880.

Application filed May 1, 1879.

To all whom it may concern:

Be it known that I, JAMES R. COLE, of Warm Springs, Madison county, North Carolina, have made a new and useful invention in Hydraulics, of which the following is a specification.

This invention relates to an improved hydraulic engine; and it has for its object to provide a simple and effective means of utilizing water-power for driving machinery of various descriptions.

The invention consists in an improved arrangement of the piston and cylinder, whereby the cylinder is made to serve the double purpose of a tank for holding the water to operate the piston and the chamber in which the piston travels.

In the drawings, Figure 1 represents a perspective view of my improved cylinder with a portion broken away, showing the piston and valve; and Fig. 2 represents a vertical section of the apparatus.

The letter A indicates a vertical cylinder of any suitable dimensions, constructed of material of sufficient strength to withstand the pressure of the water.

The letter B indicates a piston fitting closely within the lower part of the cylinder, and C a flexible skirt secured to said piston and to the bottom of the cylinder.

The letter D indicates an opening in the piston, and E a valve mounted in a valve-box, F, open at opposite sides. Said valve is provided with a valve-rod, G, said valve-rod, as well as the piston-rod L, extending upward through apertures in a guide-bar, H.

The letter I indicates a tube extending from the lower part of the cylinder and provided with a valve, K.

The piston being elevated and the valve E raised, upon pouring water into the cylinder it will flow through the valve, filling the space between the piston and the bottom of the cylinder, and finally filling the cylinder. Then upon opening the valve K the weight of the water will force the piston downward, discharging the water through the valve K, thus utilizing the hydraulic pressure of the column of water above the piston, which can be transmitted by suitable mechanism connected to the piston and applied to any apparatus where great pressure is required.

The present invention is, among other things, particularly applicable to purposes in which a single powerful stroke is required, such as hydraulic and other presses, punching and die-cutting machines, and the like.

The operation of the invention is as follows: The piston is first lifted and the valve elevated in any suitable manner, the valve in the lower part of the cylinder being closed. Water is then allowed to run into the cylinder until it is full, when the valve below is opened, and, the piston and its valve being released, the pressure of the column of water above the piston will close the piston-valve and will force the piston downward. When the piston completes its stroke the water is allowed to run off from the cylinder in any desired manner. This may be accomplished by simply lifting the piston-valve, which, owing to its small area, will require but comparatively little power. As the piston, owing to its skirting, never sets closely against the bottom of the cylinder, the water will flow through the space left and out through the valve at the bottom of the cylinder until the cylinder is exhausted, leaving the apparatus in condition for further work.

What I claim is—

The combination, with the vertical cylinder, of a piston located therein near the bottom, the piston being provided with a valve the stem of which, as well as the valve-rod, extends through a guide-bar at the top of the cylinder and a valve at the bottom of the cylinder, all arranged to operate substantially as described.

JAMES R. COLE.

Witnesses:

JAS. H. RUMBOUGH,

WM. H. HARRINGTON.