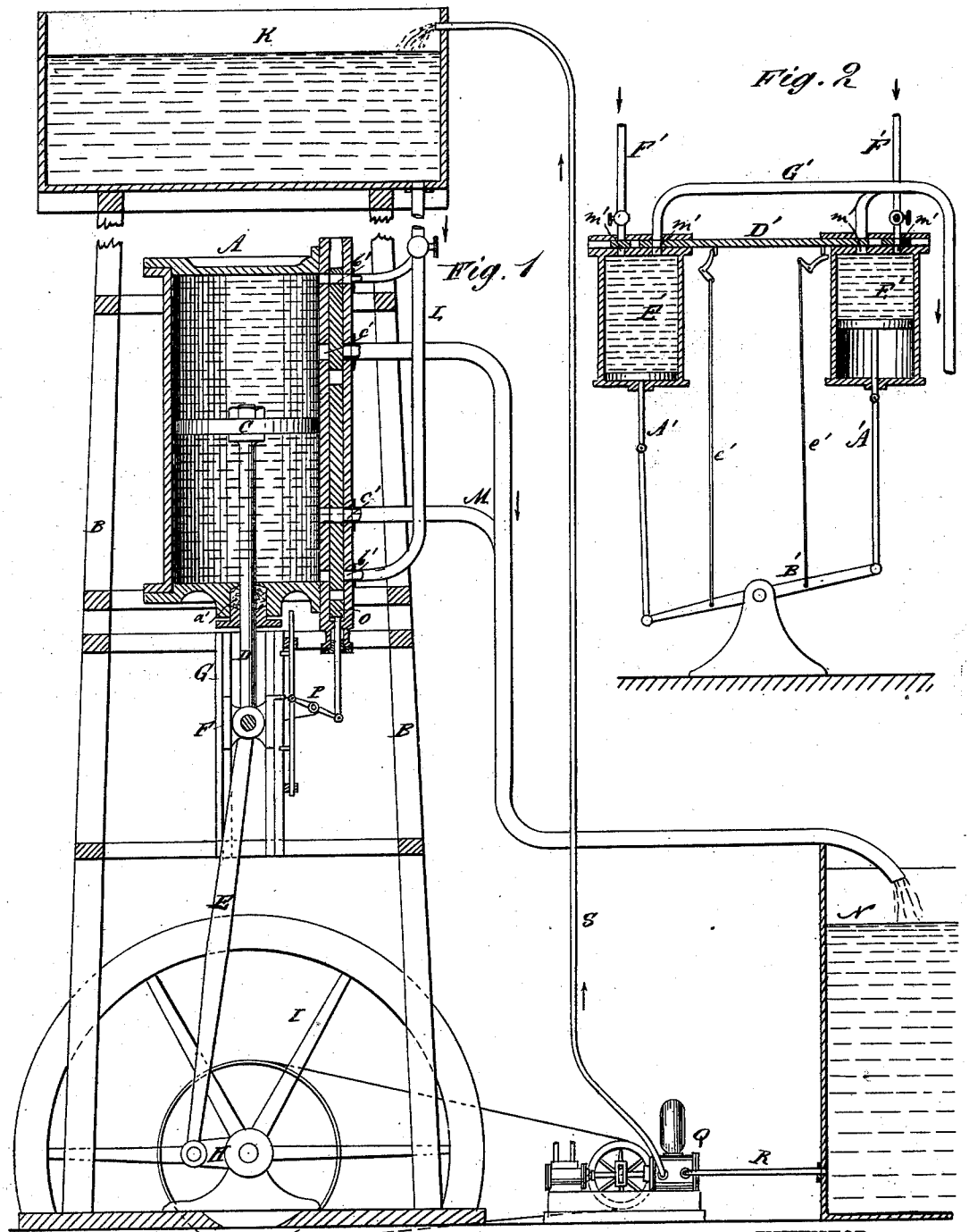
J. MORTON.

Hydraulic Engine.

No. 223,530. Patented Jan. 13, 1880.



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UNITED STATES PATENT OFFICE.

JAMES MORTON, OF PHILADELPHIA, PENNSYLVANIA.

HYDRAULIC ENGINE.

SPECIFICATION forming part of Letters Patent No. 223,530, dated January 13, 1880.

Application filed May 28, 1879.

To all whom it may concern:

Be it known that I, JAMES MORTON, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Hydraulic Engine, of which the following is a specification.

Figure 1 is an elevation of the engine and attachments, partly in section. Fig. 2 represents a modification of the device.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide a simple, inexpensive, and effective device for converting into mechanical power and motion the pressure of a column of water.

The invention consists of the cylinder A, supported in a frame, B, and containing the piston C.

Secured to the piston in the usual manner is the piston-rod D, that projects through the stuffing-box *a'*, and connects with the pitman E by means of the cross-head F, that moves in the guides G, and the pitman connects with the crank H of the driving-wheel I.

From the water-reservoir K the delivery-pipe L conducts water to the cylinder, from which it is expelled through the discharge-pipe M into the reservoir N.

The supply and discharge ports *b'* and *c'*, respectively, are regulated by the slide-valve O, which is moved by the valve-rods and connections P in the ordinary manner.

Assuming the reservoir K to be fifty feet above the cylinder, and the delivery-pipe L to be two and a quarter inches in diameter, the cylinder to be twelve inches in diameter and twelve inches long, and the stroke six inches, or half the length of the cylinder, it is found that the pressure upon the piston will be about two thousand four hundred and fifty-two pounds, or nearly twenty-two pounds per square inch, provided the cylinder above the piston be filled with water, which, at one hundred and fifty strokes per minute, will exert about ten-horse power. The water being in the reservoir K flows down the pipe L into the upper part of the cylinder, and by its pressure forces the piston down, while at the same time the valve is made to close the upper exhaust and lower supply ports. On the return-stroke the valve closes the upper supply and lower exhaust ports, and opens the others, operating, as will be seen, like other slide-valves.

From the driving-pulley a belt is passed around the pulley of the hydraulic pump Q, which draws the water from the reservoir N through pipe R and forces it up through pipe S to the higher reservoir, K. The quantity of water which can be thus forced back into reservoir K in a given time will obviously be much less than that required to operate the piston C during the same period, and hence the diameter of pipe S is made correspondingly less than that of pipe L.

The pump Q will be in operation only when the whole power of the engine proper is not required for driving machinery, &c.

In Fig. 2 is represented a device for the application of this principle, consisting of two cylinders with a piston-stroke one-half the length of the cylinder, as in the other case. In this the piston-rods A' A' are attached to a walking shaft or beam, B', and the valve-rods, with their cranks, are secured thereto, and are governed by the motion of the said beam to move the valve D', which controls the exhaust and supply ports of both cylinders E' E'. The water enters these cylinders from above through the pipes F', and is discharged through pipe G'.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An engine-cylinder in which the piston works but half its length, the other half of the cylinder being filled with water to receive the pressure of a column of water, substantially as herein shown and described.

2. The combination of the reservoir K, containing water and elevated above the cylinder A, and pipe L, containing a column of water, with the cylinder A, whose piston C moves but half the cylinder's length and carries always water above it, for the purpose of developing power, substantially as herein shown and described.

JAMES MORTON.

Witnesses:
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