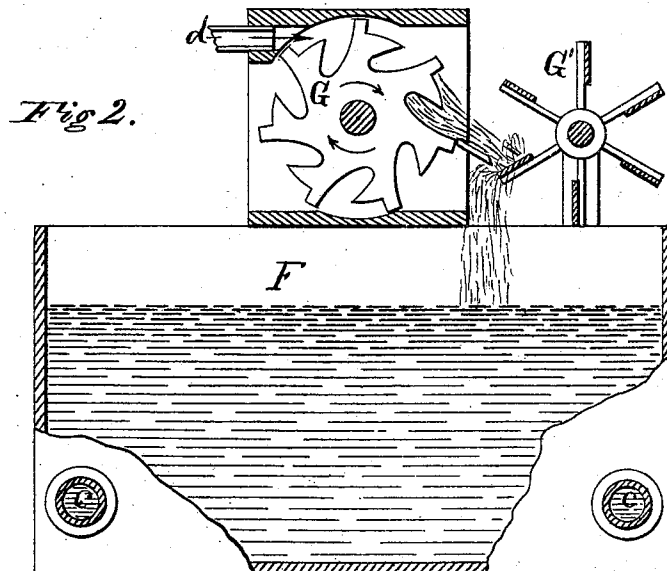
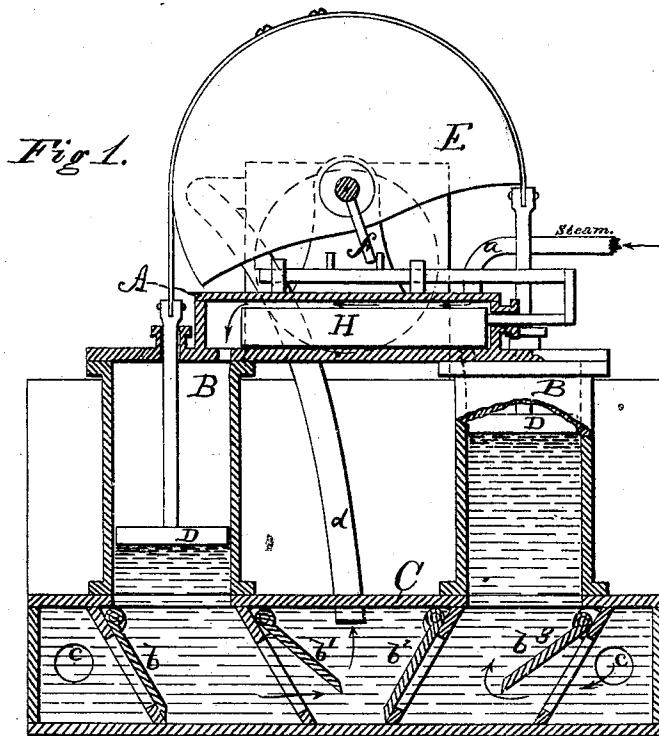


J. WIDMER.
Hydro-steam Engines.

No. 135,024.

Patented Jan. 21, 1873.



Witnesses.

Harry King.

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Inventor.

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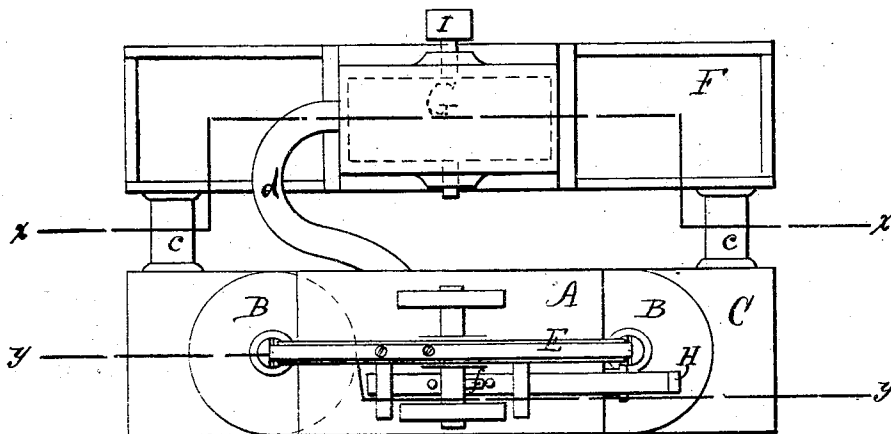
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Fig 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

JACOB WIDMER, OF BRISTOL, CONNECTICUT.

IMPROVEMENT IN HYDRO-STEAM ENGINES.

Specification forming part of Letters Patent No. 135,024, dated January 21, 1873.

To all whom it may concern:

Be it known that I, JACOB WIDMER, of Bristol, in the county of Hartford and State of Connecticut, have invented certain Improvements in Hydro-Steam Engines, of which the following is a specification:

The first part of my invention consists of the combination of a steam-chest, cylinders, pistons, pipe, and water-chest, arranged to operate with steam in the cylinders upon one side of said pistons and water upon the other side of the same pistons; and, second, of the combination of abovesaid parts with a water-wheel and tank or reservoir, as hereafter described.

In the accompanying drawing, Figure 1 is a vertical section of an engine which embodies my invention, the plane of section being indicated by line *y y*, Fig. 3. Fig. 2 is a similar section of the same on line *x x* of Fig. 3; and Fig. 3 is a plan or top view of the same.

A designates a steam-chest, which receives its supply of steam through the pipe *a*. This steam-chest is mounted centrally between and above two cylinders B B, as shown, and the cylinders B B are mounted upon a water-chest, C. The water-chest is provided with valves *b b*¹ *b*² *b*³, and the cylinders are provided with pistons D D, which pistons are connected by an oscillating walking-beam, E. At one side of the parts above named is a water-tank F, (see Fig. 3,) surmounting which is a water-wheel, G, Fig. 2. This wheel may be of any of the ordinary styles now in common use. The water-chest C and water-tank F are nearly filled with water, as shown, when the steam is admitted to the steam-chest A, and enters one of the cylinders B, forcing the piston D therein downward, as shown at the left in Fig. 1. The downward movement of the piston D forces the water under it out of the cylinder, and presses it into the water-chest C. The valves are so hung, as shown, that the force of the water thus forced downward will close the valve *b* and *b*² and open the valve *b*¹, and therefore the water will escape through the pipe *d*, as indicated by darts in Fig. 1, and be forced through said pipe and upon the wheel G, and then fall into the tank F.

It will be observed that, the pistons D D being connected by a walking-beam, one piston must necessarily move upward while the

opposite one is forced downward. When the left-hand piston moves down and the other upward, the valve *b*³ will open and allow the water to flow from the tank F through the conductor *e*, and fill the space below the piston, as shown at the right in Fig. 1. When the piston at the right reaches the lower end of the cylinder the "cut-off" operates to throw the steam upon the right-hand piston and force it down, when the valves will operate as before described—to wit, valve *b*² will open and valves *b*¹ and *b*³ will be closed, so that the water can only escape through the pipe *d*—the different pistons operating in like manner alternately and repeatedly, thus forcing a constant stream of water upon the wheel, from which it falls into the tank, and is used over and over indefinitely. A driving-pulley, I, is attached to the shaft of the wheel G, for the purpose of imparting the power from the wheel to any machinery desired. The water is thrown upon the wheel G with such force that it leaves the wheel with considerable velocity; therefore, if desired, a supplementary wheel, G', may be placed near the main wheel, to be operated by the water that is passing from the wheel G to the tank F.

It is obvious that the mechanism described for raising the water may be useful for other purposes than that of feeding a water-wheel.

A few of the advantages of my invention are, that by applying the steam first directly upon one piston and then the other I avoid the "dead-center" of ordinary pumps and engines, and that by using steam upon one side of the piston and water upon the other side of the piston in the same cylinder the pistons require but little if any packing; and I dispense with a large amount of friction.

I claim as my invention—

1. The combination of the steam-chest A, cylinders B B, pistons D D, water-chest C, and pipe *d*, arranged and operating substantially as and for the purpose described.

2. In combination with the subject-matter of claim 1, the water-wheel G, and its reservoir or tank F, all arranged and operating substantially as and for the purpose described.

JACOB WIDMER.

Witnesses:

JAMES SHEPARD,
J. G. CASE.