

*Cary & Smith,
Hydraulic Engine.*

N^o 10665.

Patented Mar. 21, 1854.

Fig. 1.

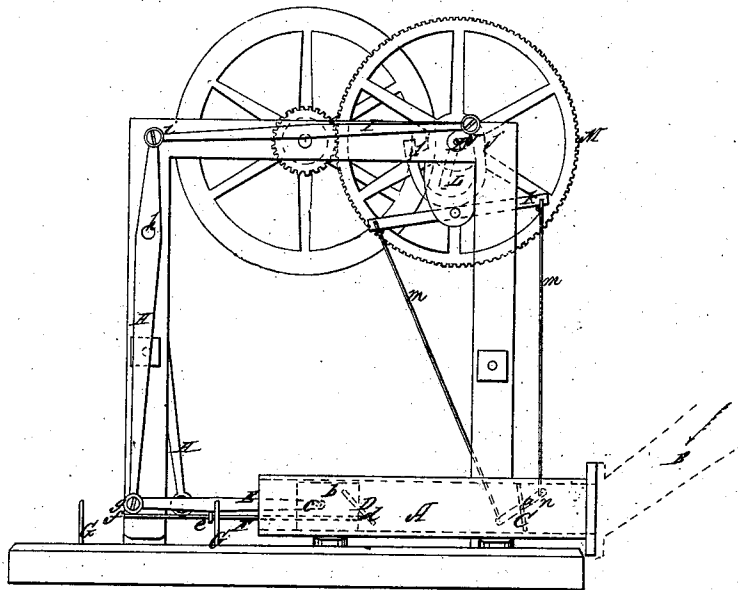
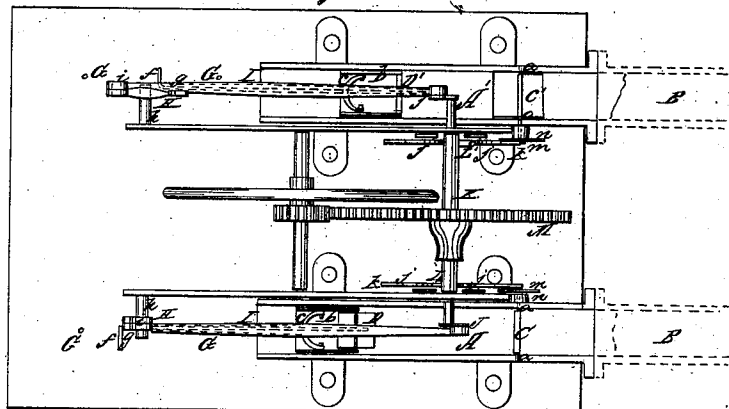


Fig. 2.



UNITED STATES PATENT OFFICE.

A. C. CAREY AND J. SMITH, OF IPSWICH, MASSACHUSETTS.

HYDRAULIC ENGINE.

Specification of Letters Patent No. 10,665, dated March 21, 1854.

To all whom it may concern:

Be it known that we, AUGUSTUS C. CAREY and JEREMIAH SMITH, of Ipswich, in the county of Essex and State of Massachusetts, have invented a new and Improved Hydraulic Engine; 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 drawings, making a part of this specification, in which—

Figure 1, is a side elevation of an improved hydraulic engine. Fig. 2, is a plan or top view of ditto, the tops of the trunks in which the pistons work, being removed.

Similar letters of reference indicate corresponding parts in the two figures.

This invention relates to a new and improved hydraulic engine, whereby the power of water is applied to the propelling of machinery, and is intended to be used in lieu of the different water wheels in present use.

The nature of our invention consists in having two horizontal trunks, water chambers, or cylinders, provided each with a valve and piston. The pistons have adjustable or movable heads, and the ends of the piston rods are secured to connecting rods or levers, which are attached to reverse cranks on a shaft, having a gear wheel upon it, from which gear wheel the power is taken. The water from the flume is made to act, by means of the valves in the trunks, chambers, or cylinders, first against one piston, and then against the other, and a continuous rotary motion is given the crank shaft. The water in the trunks, chambers, or cylinders, after acting against the pistons the length of the stroke, is let out by the operation of the movable heads, as will be hereafter fully shown and described.

The arrangement of the valves and movable piston heads, constitute the invention.

To enable others skilled in the art, to make and use our invention, we will proceed to describe its construction and operation.

A, A', represent two trunks, water chambers, or cylinders; rectangular trunks are shown in the drawings, but cylinders may be used. These trunks are placed in a horizontal position, and parallel with each other, as shown in Fig. 2. The outer ends of the trunks are provided with flanges, and are secured directly to the flume, or to pipes, B, B, leading therefrom—see dotted lines. Within the trunks, A, A', and near their

outer ends, are valves, C, C', one in each trunk. These valves are hung upon horizontal shafts, (a), (a), which pass directly through their centers, and have their bearings in the sides of the trunks, see Fig. 2.

D, D', are the piston heads which are constructed similarly to the valves, C, C', the heads being secured at the ends of boxes, (b), (b), to which the piston rods, E, E, are secured by joints, (c), (c). The lower ends of the heads, D, D', are attached by pivots, (d), (d), to rods, F, F, which pass through eyes, (e), (e), underneath the piston rods, see Fig. 1, and the outer ends of the rods, F, F, are bent or curved at right angles with their other parts, as shown at f, f in Fig. 2.

G, G, are two vertical pins or studs, placed at a distance apart, equal to the length of the stroke of the piston. There are two pins to each trunk, and the pins are placed at the inner ends of the trunks, and in line with the bent portions, (f), (f), of the rods, F, F, as shown in Fig. 2.

The outer ends of the piston rods, E, E, are connected by pivots, (g), (g), to the lower ends of levers, H, H, which have their fulcrum at (h), (h), and the upper ends of the levers, H, H, are connected by pivots (i), (i), to connecting rods, I, I, which are connected to reverse cranks, J, J, upon a shaft, K.

L, L', are pins upon the shaft, K, placed in a reverse position. These pins act against curved arms (j), (j), (j'), (j'),—two to each pin, and an arm on each side of the shaft, K; the lower ends of each pair of arms are secured to a bar, (k), which works upon a center, (l). To each end of the bars, (k), (k), a wire, (m), is secured, and these wires are attached to arms, (n), (n), one end of the valve shafts, (a), (a).

M, is a gear wheel upon the shaft, K, from which gear wheel the power to be applied to the propelling of machinery is taken.

Operation: The water passes simultaneously into both trunks, A, A', and is arrested in one of them by the closed valve, C. The valve, C', in the other trunk, A', being open, the water acts upon the piston head, D', and forces it along till it reaches the end of the trunk, when the valve, C', is closed, by means of the pin, L', acting against the arm, (j'), (j'), at one end of the shaft, K, and the head, D', is opened by means of the bent portion, (f), of the arm coming in

contact with the outer pin, G, and the water passes out of the trunk. A short time previous to the closing of the valve, C', the valve, C, in the opposite trunk, A, is opened 5 by the pin, L, acting against the arms, (j) (j'), and the water acts against the head, D, a short time before the head, D', in the opposite trunk, stops. The head, D, is now forced along, and the head, D', is consequently 10 moved back, in an open state, to its original position in the trunk, A', owing to the connection of the piston rods, to the crank shaft, K, when the head, D', has nearly reached the length of its backward 15 stroke, the bent portion, (f), comes in contact with the inner pin, G, and closes the head, D', which is now ready to be again acted upon by the water.

The heads and valves in both trunks are 20 constructed and act precisely similar, but alternately, and a continuous rotary motion is given the shaft, K.

We have experimented with the within described machine, and find that we obtain 25 more power under a given head of water than can be obtained by the ordinary water wheels. We apply the water to the lowest point of the fall.

We are aware that hydraulic engines have 30 been previously used, but differently con-

structed from ours. We do not claim pistons attached to a crank shaft and working, by the force of the water, alternately in trunks or cylinders, for the purpose of applying water power to the propelling of machinery. But

What we claim as new, and desire to secure by Letters Patent, is:—

The peculiar arrangement of the valves, C, C', and piston heads, D, D', as herein 40 shown and described, viz: the piston heads being movable, or hung upon centers, and opened and closed by means of rods, F, F, acted upon by pins or studs, G, G, at each end of the strokes of the pistons, the valves, 45 C, C', being opened and closed alternately, by means of the pins, L, L', on the crank shaft, K, acting against the arms, (j), (j'), (j), (j'), by which arrangement the water is permitted to act not only alternately upon 50 the pistons, but also allowed to escape from the trunks or cylinders when the water has forced them along within the trunks or cylinders, the required distance or length of stroke.

AUGUSTUS C. CAREY.
JEREMIAH SMITH.

Witnesses:

JOSEPH S. MOARLY,
ALONZO GEER.