W. H. CLARK.
Hydraulic Engine.

No. 201,095. Patented March 12, 1878.

Fig. 1

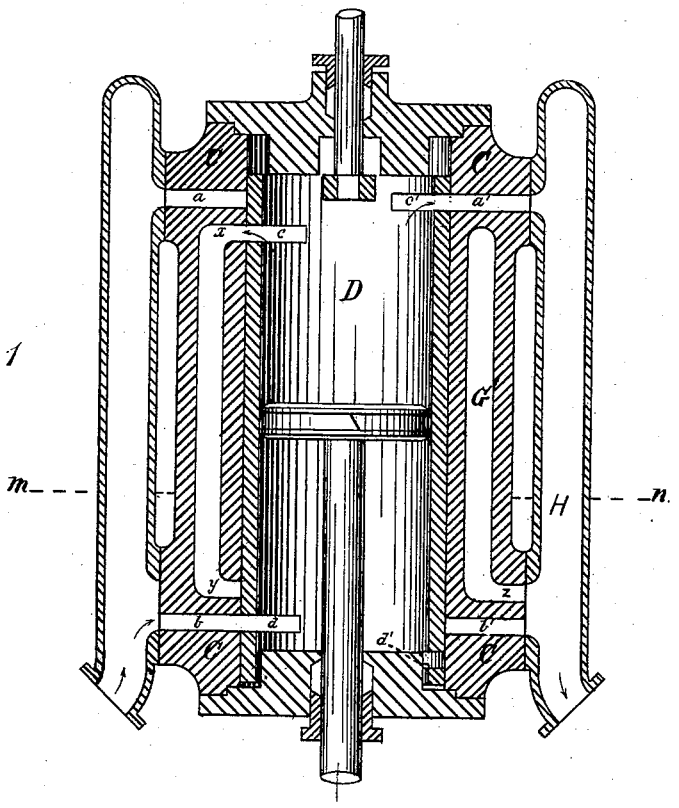
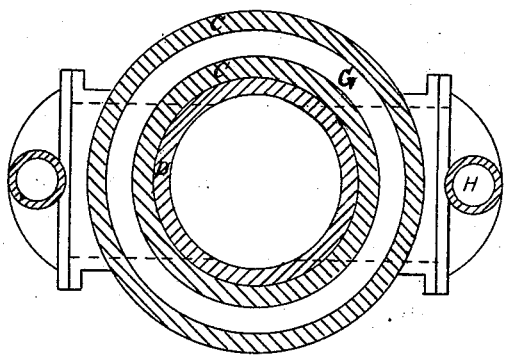


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM H. CLARK, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN HYDRAULIC ENGINES.

Specification forming part of Letters Patent No. **201,095**, dated March 12, 1878; application filed July 18, 1877.

To all whom it may concern:

Be it known that I, WILLIAM H. CLARK, of the city of Chicago, Cook county, State of Illinois, have invented a new and useful Improvement in Hydraulic Engines, which improvement is fully set forth in the following specification and accompanying drawing.

This invention is an improvement upon the hydraulic engine described in Letters Patent of the United States No. 190,005.

The object of my present improvement is to increase the area of the exhausting capacity, so that the water can pass out of the cylinder with greater facility.

Figure 1 is a vertical longitudinal section of the cylinder. Fig. 2 is a sectional view of cylinder at *m n*.

In my former patent, No. 190,005, the cylinder C and sliding cylinder D are provided with only four ports each. In the present case the cylinder C is provided with two ports, *a b*, through which the water enters to the interior of D, and four exhaust-ports, *a' b'* and *x y*, the two connecting with a passage, G, extending around the entire cylinder, or around half the cylinder, in either direction, and opening at *z* into the exhaust-chamber or pipe H. More exhaust-ports may be added, if desired.

As shown, the heads or ends of C act as heads for the cylinder D, and this form is preferred; but it is evident that one or both ends of D may have separate tight heads.

The sliding cylinder D, and the piston inside of it, reciprocate in the manner shown in my former patent No. 190,005. The sliding cylinder D stands so that the ports coincide—*b* with *d*, *c* with *x*, *c'* with *a'*—when the piston is at the lower end of D, so that when the water enters through *b d* the exhaust passes out through *c x* and *c' a'*; and when the piston is near the upper end of D, the sliding cylinder D is moved, so that *a* and *c*, *d* and *y*, and *d' b'* will coincide, when the water will enter through *a c*, and the exhaust will pass through *d y* and *d' b'*, so that when the piston is moving in either direction there will always be two or more exhaust-ports open and one supply-port open.

It will be seen that by the increased area for exhaust the entire pressure of water is imparted to the area of the piston, and no back pressure is given to the piston on the exhaust side.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a hydraulic engine, the cylinder C, provided with inlet-openings *a b* and the outlet-openings *a' b' x y*, *x y* being connected with *z* by the passage around the cylinder, in combination with the cylinder D, having inlet and outlet ports, substantially as and for the purposes specified.

2. In a hydraulic engine, the interposed secondary discharge-space G, having interior inlets *x y* and one or more outlets, *z*, substantially as described.

WILLIAM H. CLARK.

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