

(No Model.)

J. E. HENSHALL & G. E. FLING.

HYDRO EXTRACTOR.

No. 303,389.

Patented Aug. 12, 1884.

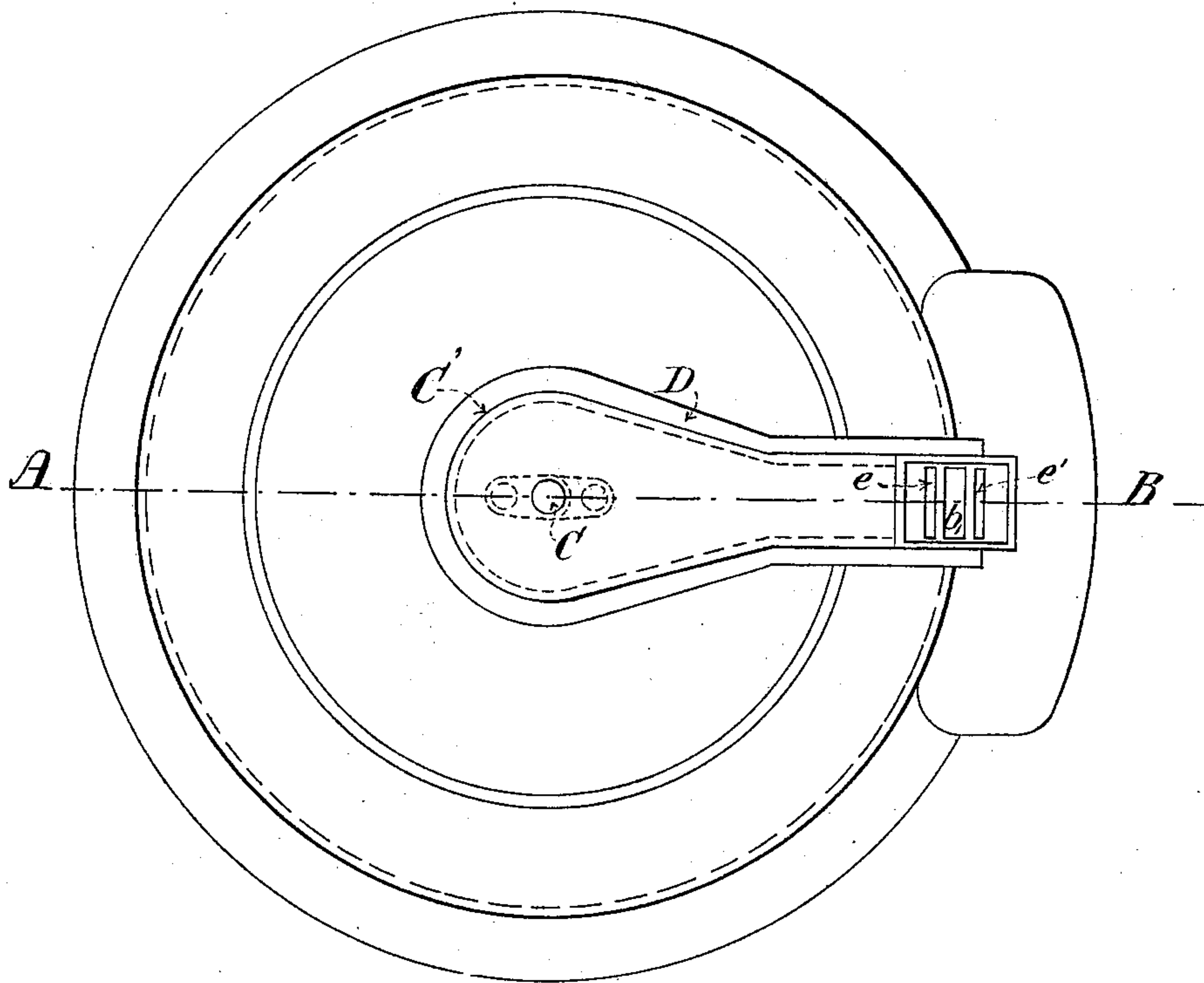
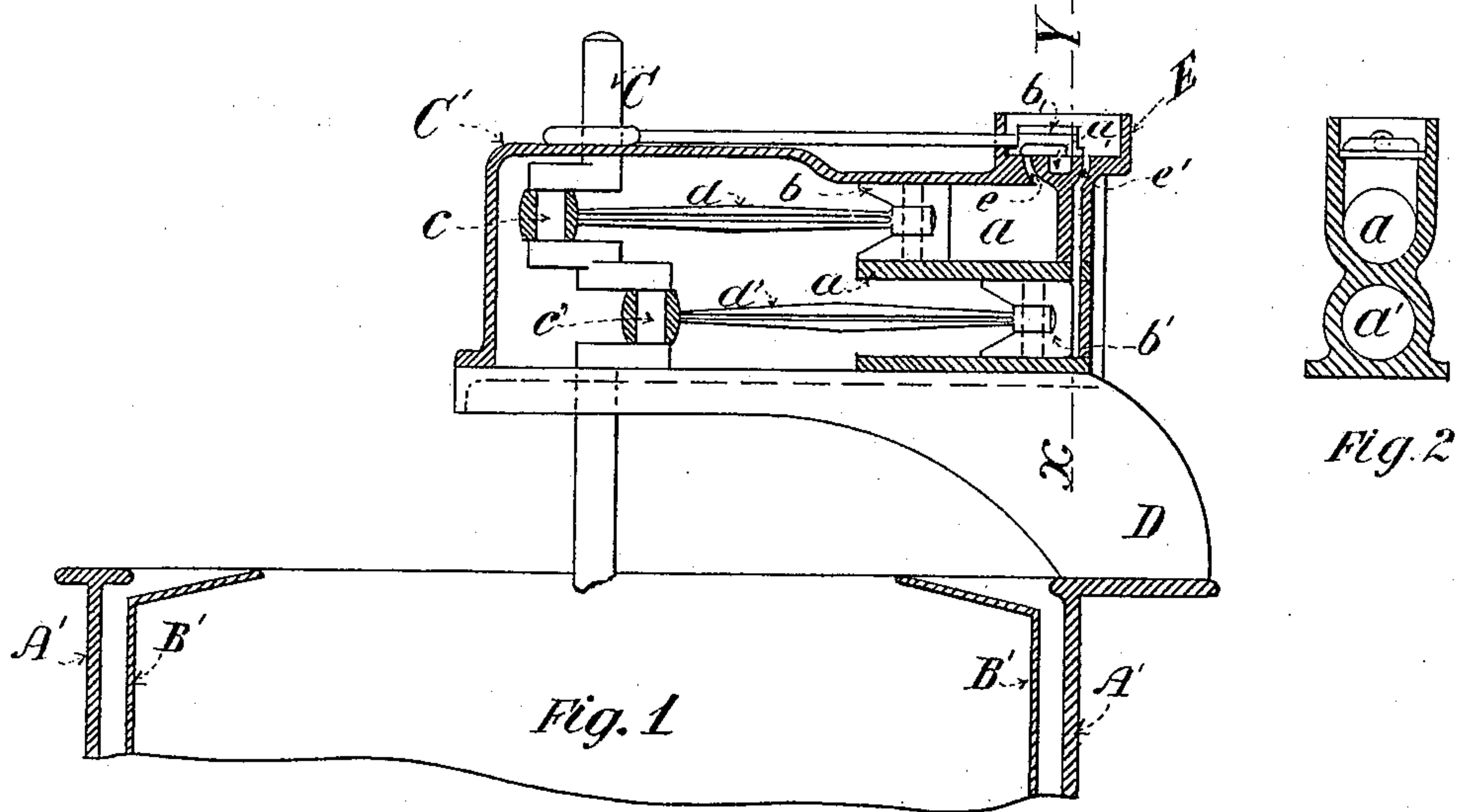


Fig. 3

WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN E. HENSHALL AND GEORGE E. FLING, OF PHILADELPHIA, PA.

HYDRO-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 303,389, dated August 12, 1884.

Application filed May 5, 1884. (No model.)

To all whom it may concern:

Be it known that we, JOHN E. HENSHALL and GEORGE E. FLING, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Hydro-Extractors; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to that class of hydro-extractors that are driven by a steam-engine integral therewith or attached directly thereto; and the object of our improvement is to construct the said machine so that it can be run at the highest rate of speed of which the engine is capable, and at the same time be free from the jolt and tremor occurring in machines of this class when constructed in the ordinary way.

In the accompanying drawings, Figure 1 shows a vertical section on line A B of a hydro-extractor with the engine secured thereon. Fig. 2 is a cross-section through the engine on the line *x y*. Fig. 3 is a plan view.

A' is the external stationary casing of the hydro-extractor. B' is the internal perforated rotating basket or casing. Both the external casing, A', and the internal perforated basket, B', are of the kind commonly used, and they are arranged together in the usual way.

C is the vertical driving-shaft, to which the perforated basket B' is attached.

c c' are two cranks on the shaft C.

D is an arm secured on the outer rim of the casing A'. This arm extends over the center of the machine and forms a support for the engines and bearings for the upper end of the vertical crank-shaft C.

a a' are two steam-cylinders of the kind ordinarily placed in engines of this description. *b b'* are pistons working therein.

d d' are piston-rods making the connections to the crank-shaft.

e e' are ports for introducing the steam to the cylinders; *a*, the exhaust; *b*, the sliding valve for opening and closing the ports *e e'*; *c*, the connecting-rod operating the valve *b*.

E is the steam-chest.

The engines being in the position shown in Fig. 1, the live steam will enter the lower cylinder *a'* through the open port *e'*, and force the piston *b'* forward, thus revolving the crank-shaft C, at the same time the piston *b* is moving toward the right and the upper cylinder exhausting through the exhaust-port *a*. When the piston *b'* has made a full stroke and the valve *b* closed the port *e'* and opened the port *e*, the operation is reversed. The valve *b* and exhaust-port *a* are constructed so that both cylinders exhaust through the same port.

It will be readily seen that by constructing a machine of this kind in this way a continual push is kept up by one or the other of the pistons always operating on the crank-shaft. There being no sudden letting down and taking up of the propelling-power, all jolt, jar, or tremor is avoided, and the machines may be run to the utmost capacity of the engine. They may also be made lighter and consequently cheaper, and will not require such a secure foundation.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

The combination, in a hydro-extractor, of the arm D, having secured thereon an engine provided with two single-acting cylinders, the piston-rods *d d'*, and double-crank shaft C, secured to the perforated basket B', all substantially as shown and described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN E. HENSHALL.
GEORGE E. FLING.

Witnesses:

CHARLES H. WEISS,
SPENCER ROBERTS.