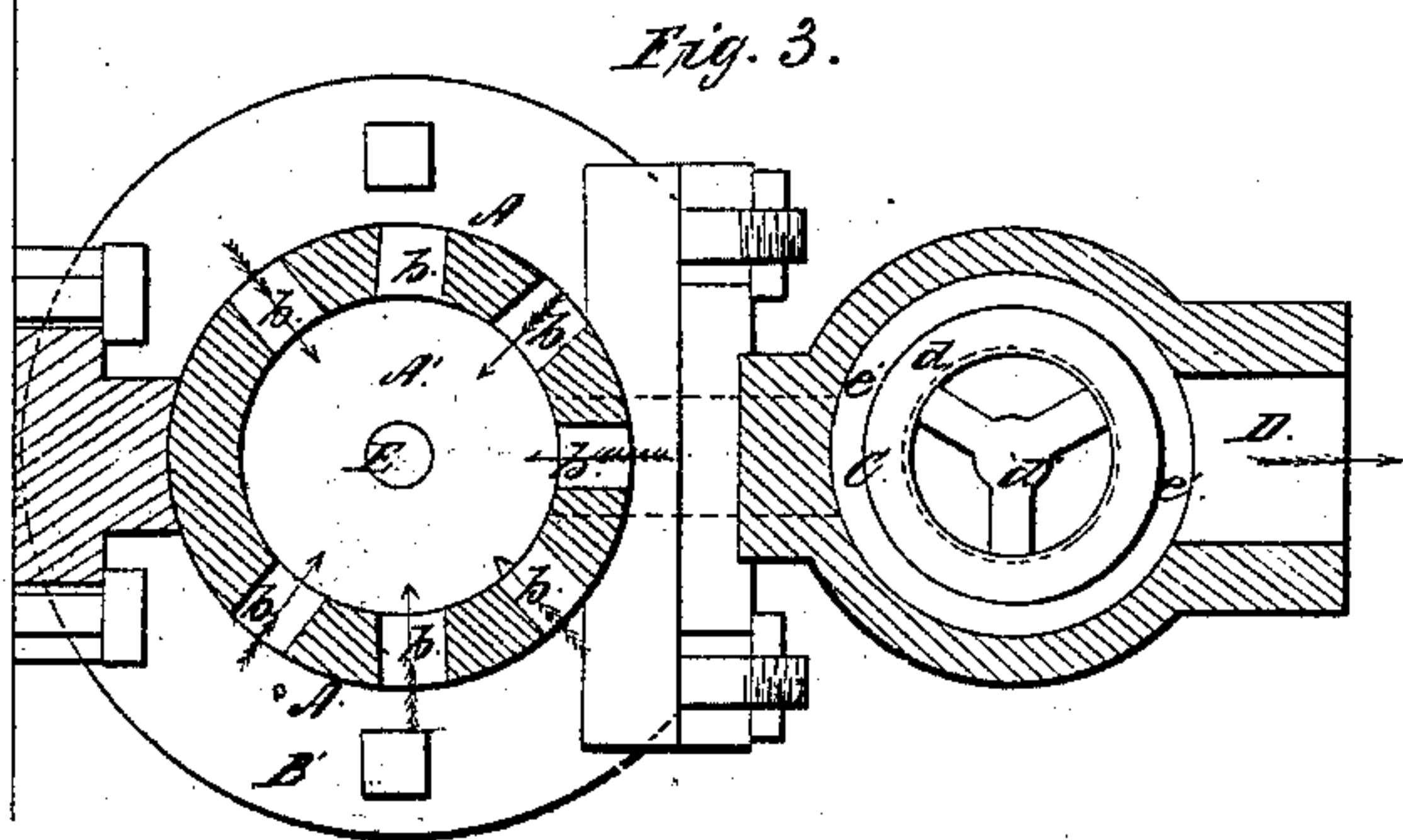
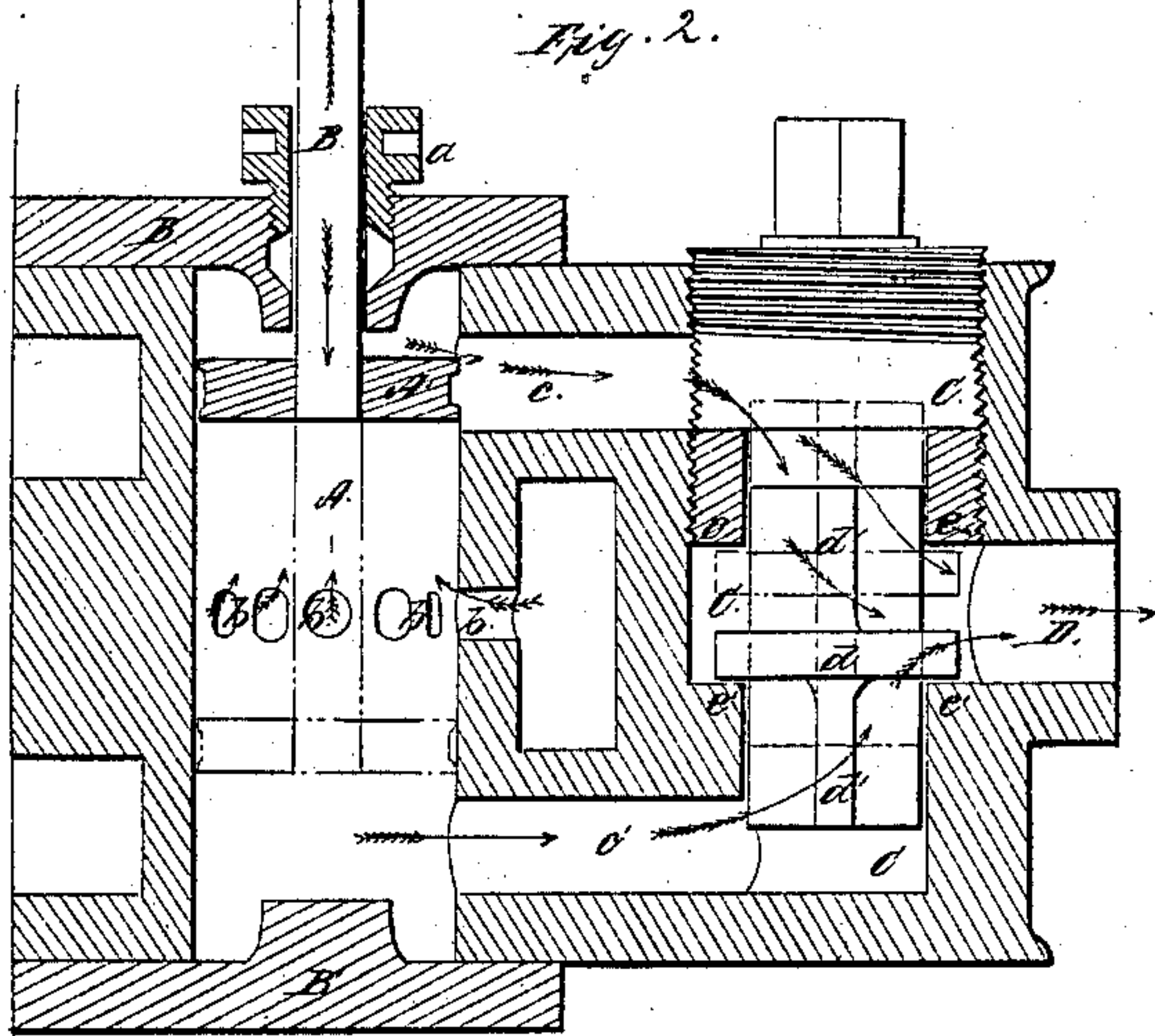
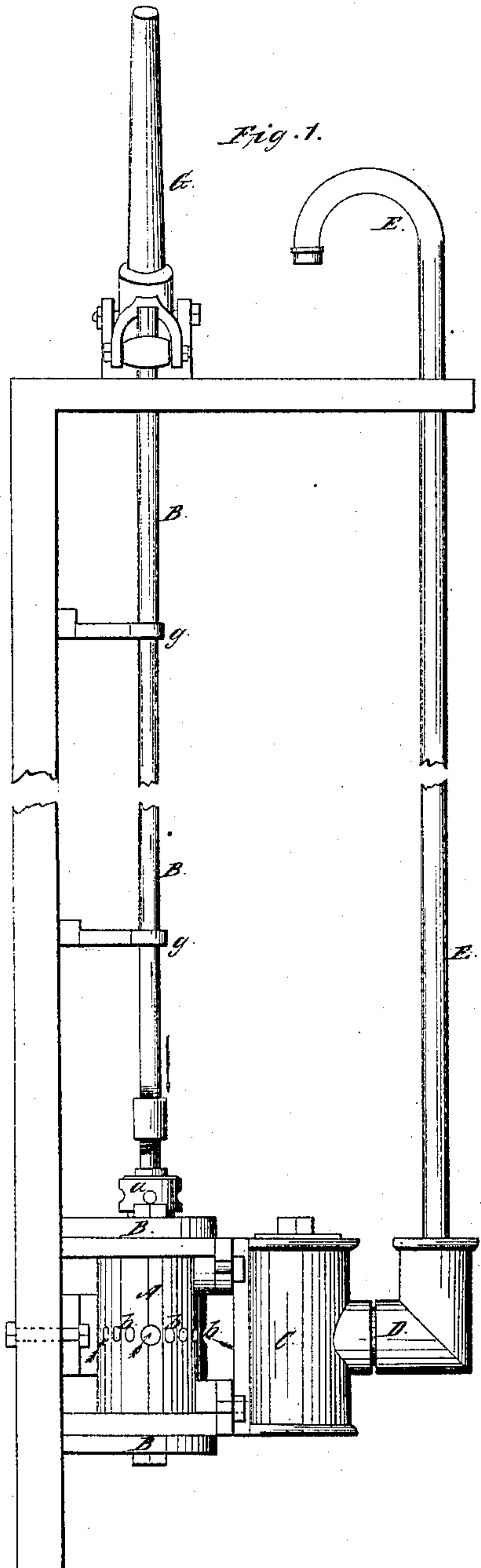


*J. DeLong,*  
*Force Pump.*

*N<sup>o</sup> 44,790.*

*Patented Oct. 25, 1864.*



*Witnesses:*  
*R. T. Campbell.*  
*E. Schaefer*

*Inventor:*  
*Joseph De Long*  
*by his Atty<sup>y</sup>*  
*Mason Kunkin Schumaker*



# UNITED STATES PATENT OFFICE.

JOSEPH DE LONG, OF UPPER SANDUSKY, OHIO.

## IMPROVEMENT IN FORCE-PUMPS.

Specification forming part of Letters Patent No. 44,790, dated October 25, 1864.

*To all whom it may concern:*

Be it known that I, JOSEPH DE LONG, of Upper Sandusky, Wyandot county, State of Ohio, have invented a new and Improved Force-Pump; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of the improved pump arranged for use. Fig. 2 is a diametrical section of the pump-cylinder and valve-chamber on the side of it. Fig. 3 is a horizontal section taken centrally through the cylinder and valve-chamber.

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

This invention relates to improvements in that class of pumps which are submerged in the water when in use.

The nature of my invention consists in providing the pump-cylinder with induction-passages, arranged at an intermediate point between its ends, and in combining with such a cylinder a valveless piston, and a double-acting valve working in a side chamber, as will be hereinafter described.

To enable others skilled in the art to make and use my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the pump-cylinder, provided with two heads, B B', one of which is solid, while the other is tapped for receiving the stuffing box *a*, through which the lower section of the piston-rod B passes. At the middle of the length of the cylinder a number of holes, *b*, are made through it for the introduction of water into said cylinder, as will be hereinafter further explained.

Near the ends of the cylinder A are two induction-passages, *c c'*, which form communications between this cylinder and a side chamber or box, C, as clearly shown in Fig. 2. This side chamber, C, is furnished with a valve, *d*, having a double face and working between two seats, *e e'*, so as to alternately cut off and open a communication between the cylinder A, above the piston A', and the induction-orifice D, and between the cylinder, below the piston, and said induction-orifice. The valve *d* is cast with flanges *d'* projecting from it for the pur-

pose of centering and keeping it in its proper relative position to the seats *e e'*.

The perforated cylinder A, solid piston A', and the valved chamber C, arranged as I have just described, constitute the main features of my improved pump.

The manner of arranging and operating the improved pump is as follows: The cylinder A is bolted to a shaft, which is carried down to and rests upon the bottom of the well, and the valve-box C is bolted to the cylinder A, as shown in Figs. 1 and 2. The orifice D, through which the water escapes from the valve-box C, is provided with a pipe, E, leading to the top of the well, which pipe is shown in Fig. 1, bent over so as to form a discharge-nozzle.

The piston-rod B may be made up of sections, united together by right and left screw-couplings. This rod extends upward through guides *g g*, and projects above the platform at the top of the well a sufficient distance to receive a pump-handle, G, which may be applied to said rod in the manner shown in Fig. 1, or in any other suitable manner.

By reference to Fig. 2, it will be seen that when the piston A' is drawn up a vacuum will be formed below the openings *b*, in consequence of the valve *d* closing the lower passage, *c'*; but when the piston rises above the openings *b* the water will rush into the cylinder and fill it. When the piston descends, a vacuum is formed above it, in consequence of the valve *d* closing the upper passage, *c*, which vacuum is instantly filled with water when the piston descends below the passages *b*. Simultaneously with the filling of the cylinder A, the piston forces the water below the perforations *b* out through passage *c'*. As the piston is again elevated, the water above it will be forced through the passage *c* and out through pipe E. Thus at every stroke of the piston the water in the cylinder is forced out through pipe E, and the cylinder again supplied through the induction-passages *b*.

It will be seen from the foregoing description and the accompanying drawings that my pump requires but one valve, and that the puppet-valve which I use answers the purpose of two ball or two flap valves. By using one valve much fitting is obviated, and in getting at the valve or its seats but a single

screw-cap has to be removed. My construction is cheap and very easily manipulated.

I am aware that a pump with two or more valves and a single piston working in a cylinder which is perforated midway of its length is shown in the application of J. M. Reeder, rejected July 20, 1860; also in the rejected application of J. K. Andrews, dated November 17, 1860. Therefore I do not claim, broadly, such a pump; but,

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

1. The arrangement of the single double-

acting valve *d* with the intermediately-perforated cylinder A, solid piston A', and valve-chamber C, the whole constructed and operating substantially in the manner described.

2. The arrangement of the removable screw-seat *e*, constructed with a passage through it, with puppet-valve *d d'* and the perforated cylinder A, substantially in the manner and for the purpose described.

JOSEPH DE LONG.

Witnesses:

R. R. CLARKSON,

F. E. RUTH.