

# R. J. Gould.

## Steam Pump.

N<sup>o</sup> 99,877.

Patented Feb. 15, 1870.

Fig. 1.

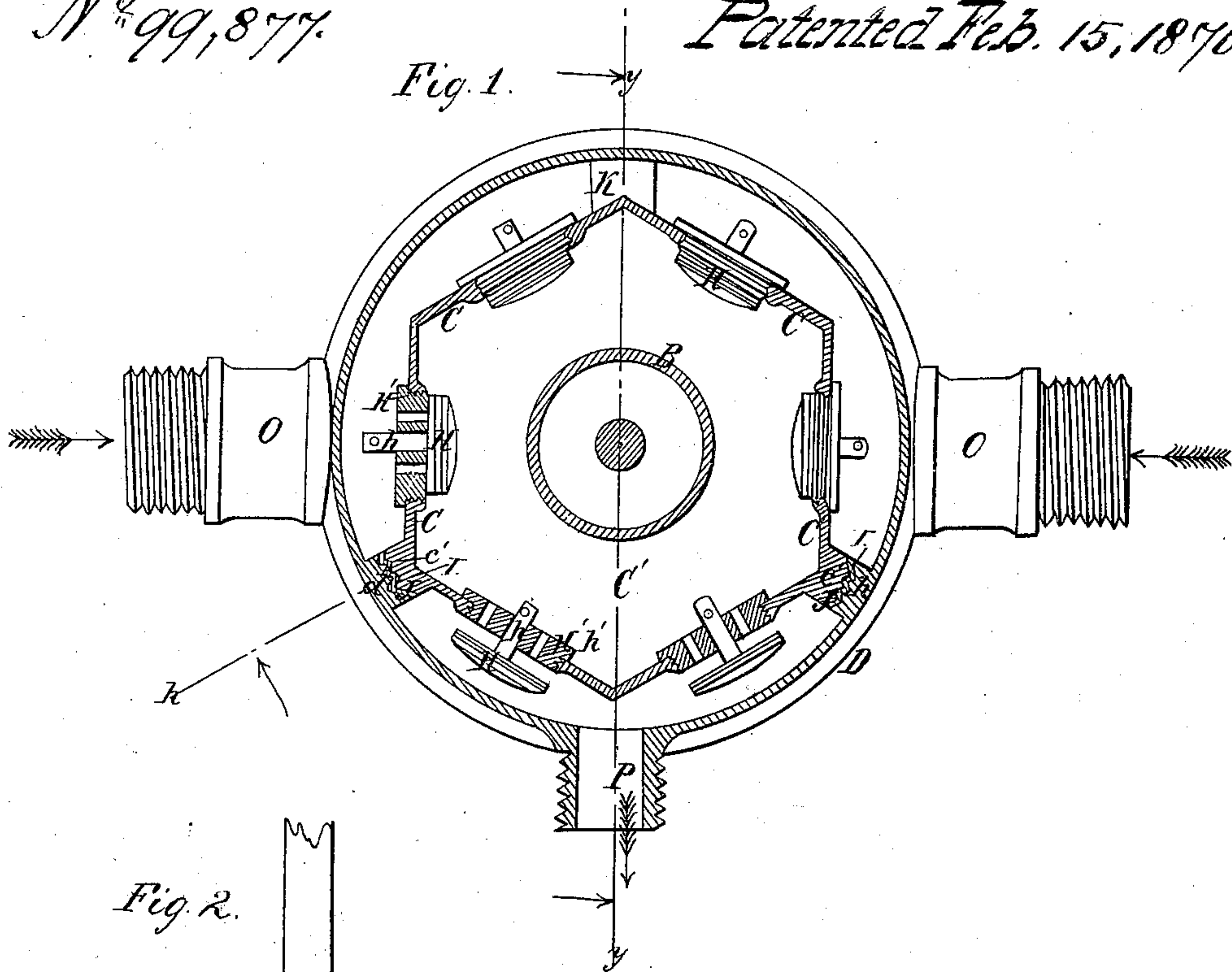


Fig. 2.

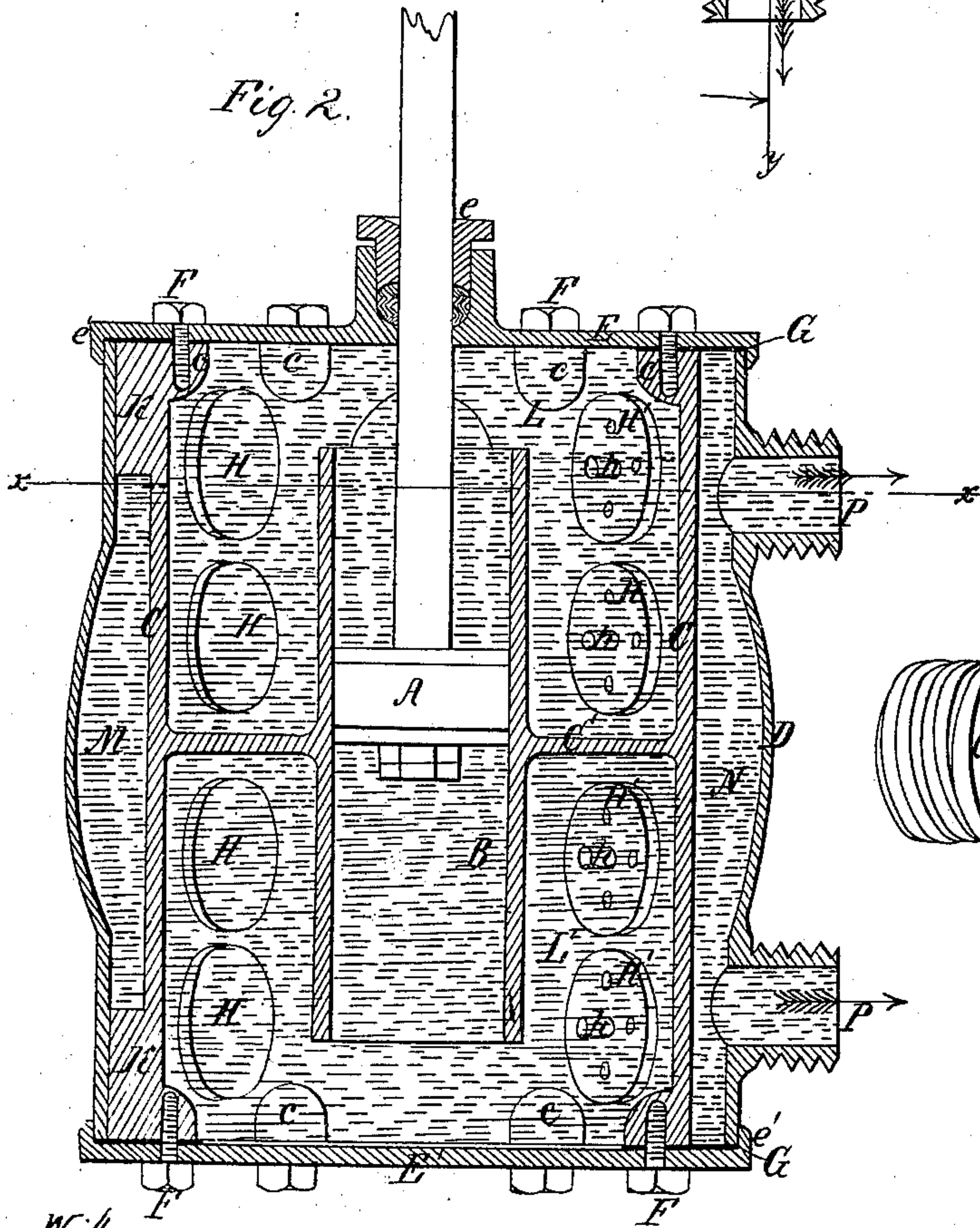
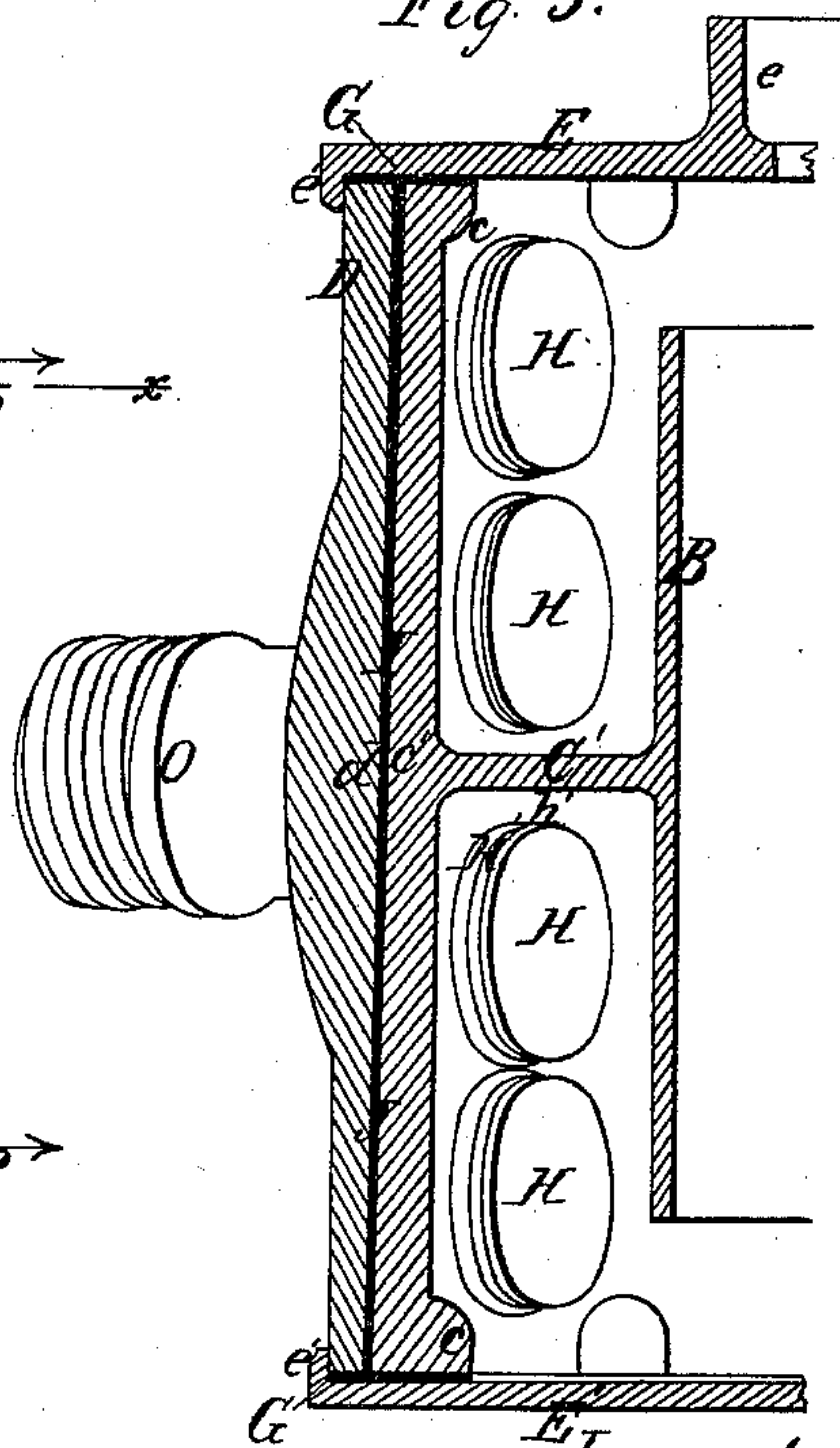


Fig. 3.



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# United States Patent Office.

ROSCOE J. GOULD, OF NEWARK, NEW JERSEY.

Letters Patent No. 99,877, dated February 15, 1870.

## IMPROVEMENT IN PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ROSCOE J. GOULD, of Newark, in the county of Essex, and State of New Jersey, have invented a new and useful improvement in Double-Acting Pumps for Steam-Engines, &c.; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings which are made part of this specification.

My invention consists of a novel construction of double-acting pump, having large water-passages and large valve area in small space; adapted to be easily and cheaply manufactured, readily taken apart to get at the valves and working parts, and not liable to get out of order.

The cylinder, open at both ends, is supported centrally in a chamber formed by a suitable shell, and the heads of a pump by a partition which further divides said chamber into two equal compartments with which the respective ends of the cylinder communicate. Said shell forms the "valve-plate" and is inclosed by an outer shell or casing forming an annular chamber external to said valve-plate, the area of which chamber is preferably increased by making the sides of the outer shell or casing bulging, and which is divided by longitudinal partitions into compartments forming the suction and discharge chambers or passages.

The bolts holding the heads of the pump are screwed into the ends of the valve-plate and serve to hold both, and also to form the joints at the end of both the valve-plate and shell. The pump is also thus adapted to be readily taken apart when desired. The valves with their seats are removable to facilitate their repair and renewal.

In the drawings—

Figure 1 is a transverse section on the line *x x*, fig. 2, of a pump illustrating my invention.

Figure 2 is a longitudinal section of the same on the line *y y*, fig. 1.

Figure 3 is a partial longitudinal section on the line *z*, fig. 1.

A represents the piston, which may be of any suitable form.

B represents the open cylinder in which the piston A works.

C, the inner shell or valve-plate surrounding said cylinder; and

C', the partition employed to support said cylinder and divide the chamber formed by said valve-plate.

D represents the outer shell or casing surrounding the valve-plate C, and forming the suction and discharge-chambers or passages, and which is preferably made bulging, as shown, to increase its capacity.

E E' represent the heads, the former of which is provided with a suitable stuffing-box, *e*, for the rod of the piston A.

*e' e'* are maginal flanges formed on the heads E E' for the support of the casing D.

F F represent the bolts employed to connect the parts of the pump, and which passing through the heads E E' are screwed into the ends of the valve-plate C.

*c c* are bosses provided on the valve-plate C for the reception of the bolts F.

G G represent the packing employed between the ends of the valve-plate C and casing D, and the heads E E', and which may be of the usual or any suitable description.

H H represent the valves; and

H' H' their open removable seats. They both may be of any suitable form and material.

The latter are secured in the valve-plate C by being screwed into corresponding apertures therein, flanges *h* thereon or equivalent means serving to limit their insertion.

The former may be secured to their seats and guided by stems *h*, having a pin passing through them at their outer ends, as shown, or in other suitable manner.

The valve-plate C is preferably made with flat sides or faces for the reception of the valves, as shown, the number of said faces varying according to the size and character of valve and the capacity of the pump. The suction and discharge-valves may be similar both in area and form, as shown, or otherwise if preferred, and are arranged respectively on the inner and outer sides of the valve-plate C.

I I represent the longitudinal partitions employed to divide the annular space between the valve-plate C and casing D into the suction and discharge-chambers or passages.

Said partitions are preferably formed by flanges *c' d*, on the valve-plate and casing respectively, provided with intermeshing projections and grooves and made tapering, as represented in fig. 3, (the small diameter being at the end at which the piston-rod enters,) to facilitate the insertion and packing of the valve-plate.

J J represent packing employed in the joints of the partitions I, as shown.

K K are stays employed between the partitions I I to assist in supporting the valve-plate C and casing D, and preferably formed on the valve-plate, as shown.

L L' represent the valve-chambers; and

M, the suction; and

N, the discharge-chambers or passages.

O O represent the connection for the suction-pipes; and

P P, those for the discharge-pipes, both of which may be formed on the casing D, as shown.

The relative number of valves included in the suction and discharge-chambers or passages and the relative area of the pipes may be varied as desired.

The piston being as represented in fig. 2, on its



downward stroke the discharge-valves in the chamber L' are opened, and the water displaced by the piston is forced out through said valves and the chamber or passage N and pipe P, the water being meanwhile drawn into chamber L through the suction-valves in said chamber, the chamber or passage M and pipes O. On the reversal of the stroke of the piston, the action in the different chambers is of course reversed, the water in L being forced out through H N P and a fresh supply drawn into L' through H M O.

The pump (excepting the piston, valves, valve-seats, packings and screws,) is by my invention adapted to be made in four castings; the casing D forming one, the valve-plate C and the cylinder B another, and the two heads E E' the others.

A double pump may be readily made by connecting two pumps together by a waist at one of the partitions, I, and extending said partition through to meet that of the other pump.

The piston may be operated in any suitable manner. The pipes or connections O may form trunnions for the support of the pump, or it may be supported in other suitable manner.

I claim as my invention—

1. The combination and arrangement in a double acting pump, having an open-ended cylinder, B, of a circumferential valve-plate, C, a circumferential casing, D, partitions C' I I, and heads E E', to form the valve, supply, and discharge-chambers, as herein shown and described, for the purpose set forth.

2. The combination in a double-acting pump, having an open-ended cylinder, B, of the concentric circumferential spaces L L' and M N, separated by the valve-plate C, and divided respectively by partitions C' and I I into the valve-chambers and the supply and discharge-chambers, as set forth.

3. In combination, the piston A, cylinder B, valve-plate C c, casing D O P, partitions C' I c' d, I c' d, stays K K, removable valve-seats H' h' H' h', valves H h H h, heads E e c' E' e', packing G J, and bolts F F, as constructed and arranged in the manner shown and described, to form an improved double-acting pump.

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Witnesses:

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