

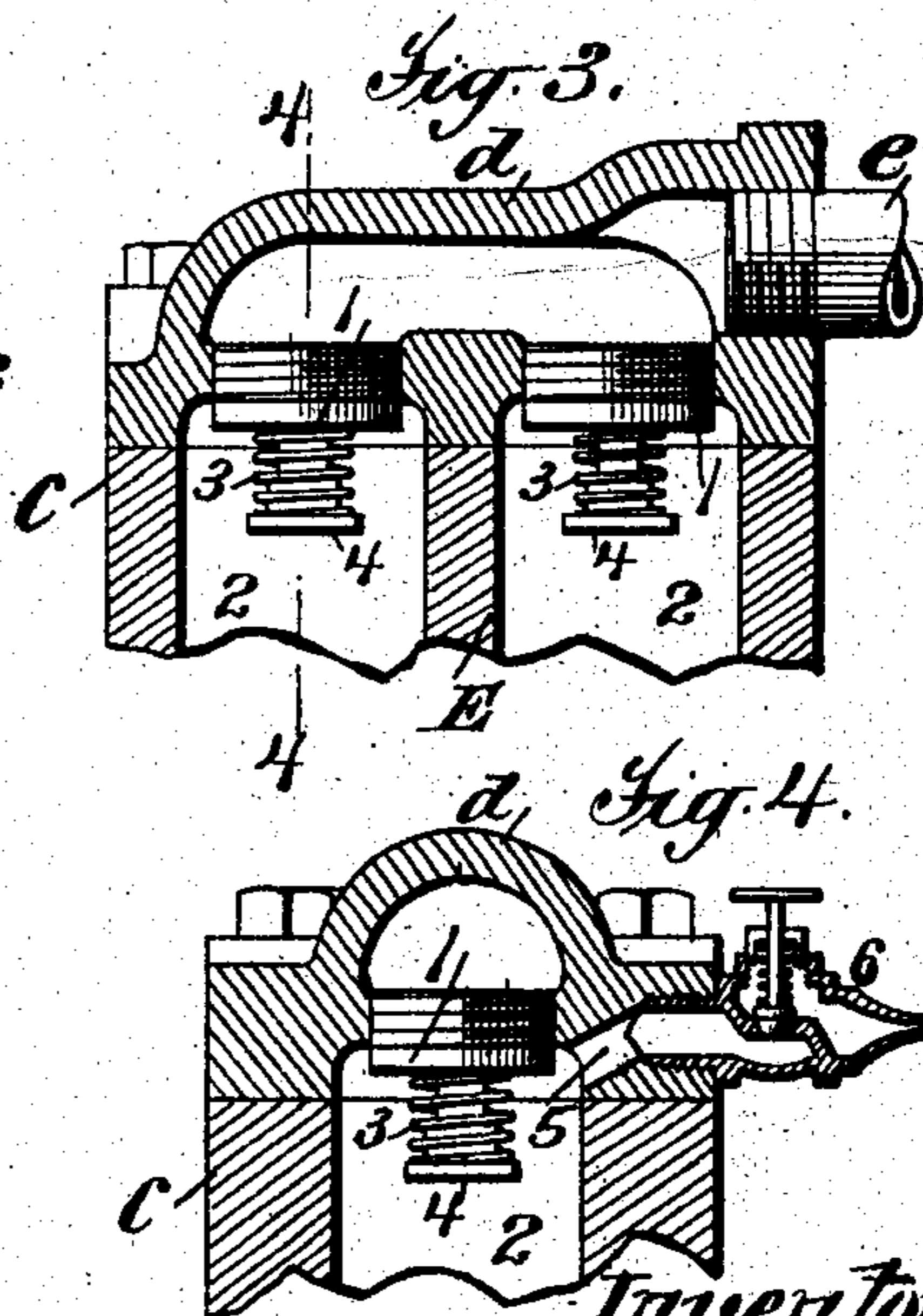
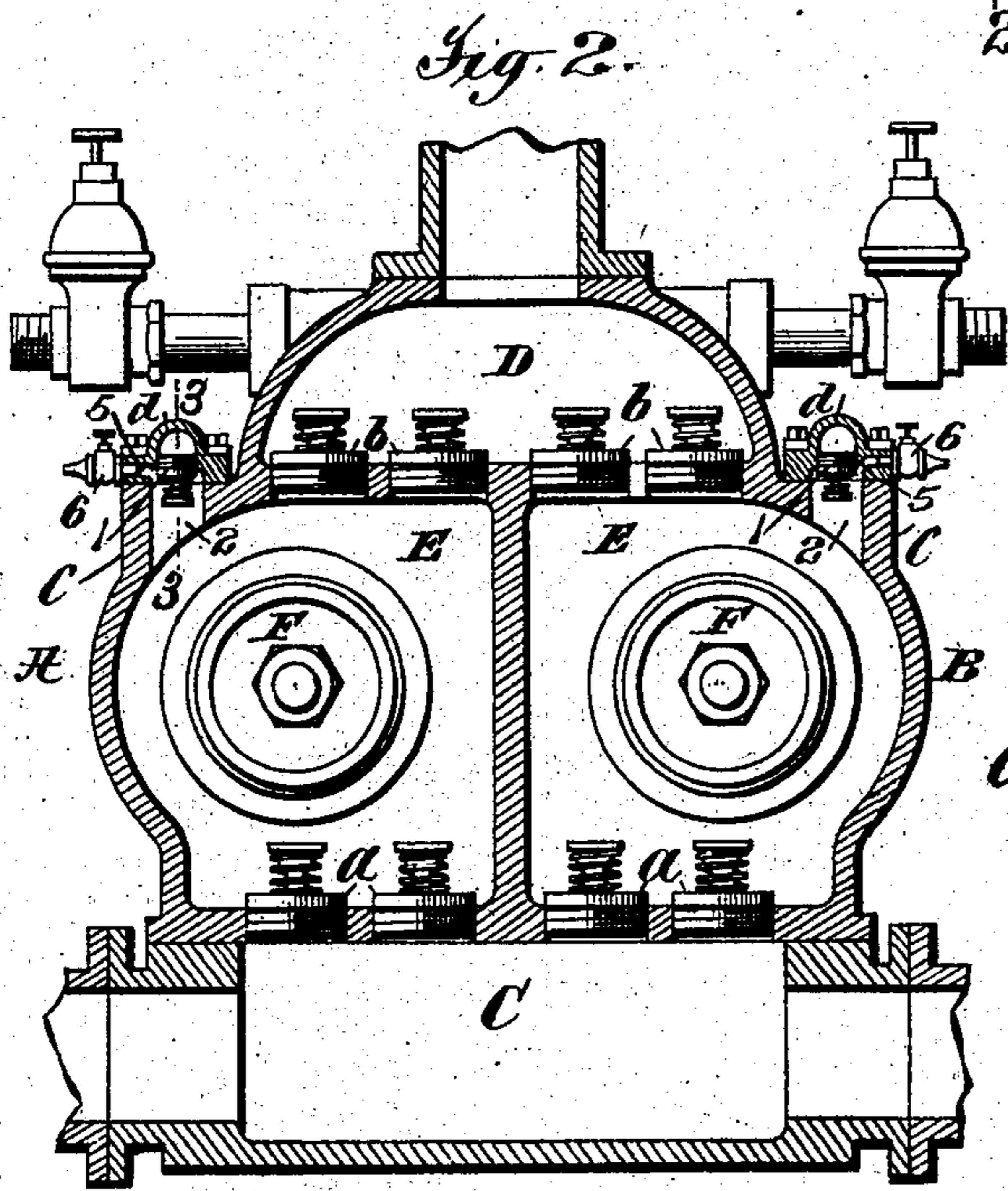
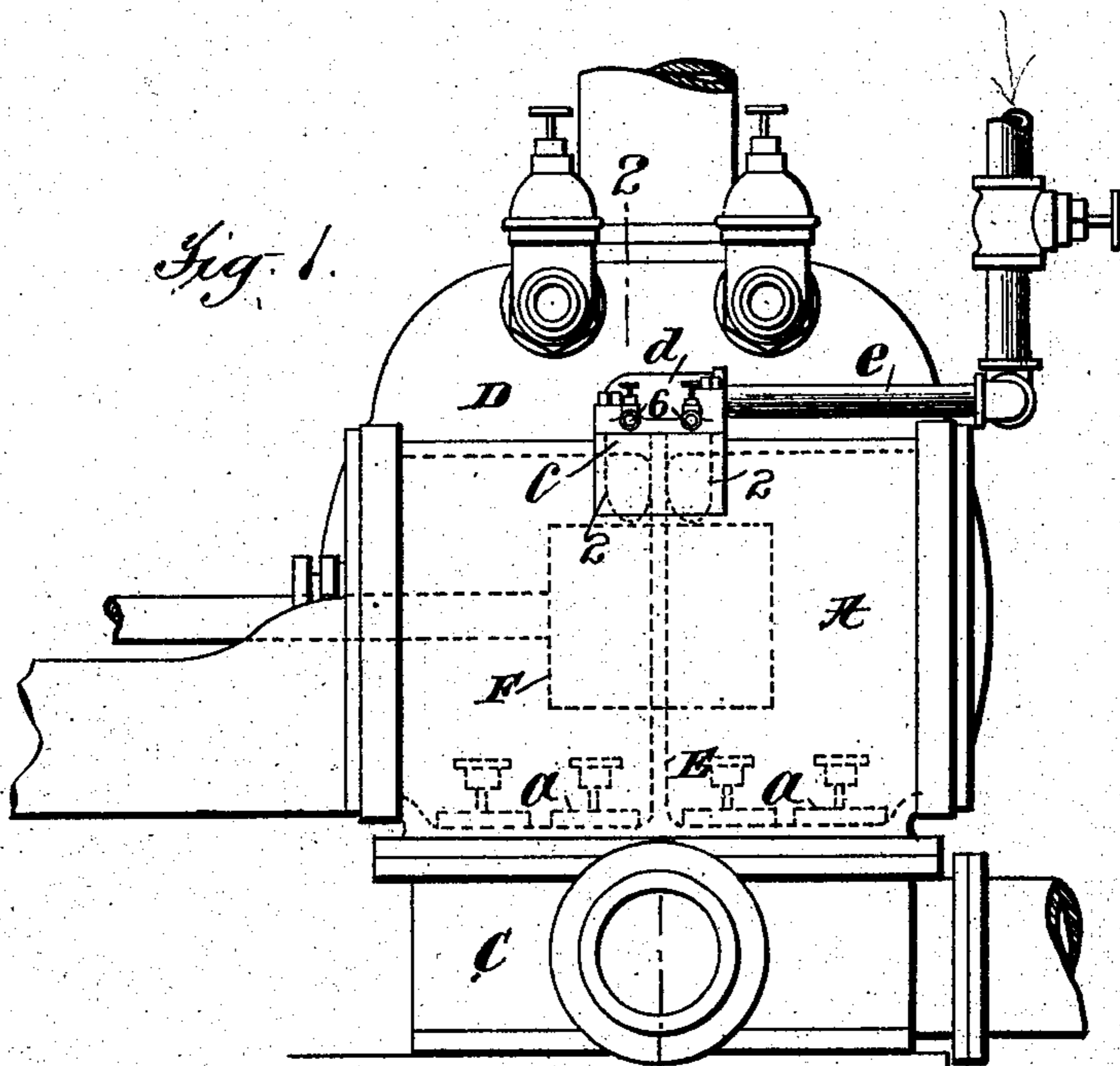
No. 693,479.

Patented Feb. 18, 1902.

C. C. WORTHINGTON.
CYLINDER CHARGING VALVE FOR PUMPS.

(Application filed Nov. 21, 1896.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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CYLINDER-CHARGING VALVE FOR PUMPS.

SPECIFICATION forming part of Letters Patent No. 693,479, dated February 18, 1902.

Application filed November 21, 1896. Serial No. 612,945. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. WORTHINGTON, a citizen of the United States, residing at Irvington, county of Westchester, and State of New York, have invented certain new and useful Improvements in Cylinder-Charging Valves for Pumps, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of the present invention is to provide an improved means for priming or charging the water-cylinders of pumps with water and expelling the air in starting the pump, so as to enable them to readily take suction, such charging being particularly desirable in fire-pumps and other pumps in which a foot-valve is not entirely reliable. This charging has heretofore been effected by carrying a pipe from some supply of water under pressure down to a point near the water cylinder or cylinders where the common pipe has been divided and a small pipe carried to and introduced between the suction and delivery valves in each compartment of the water cylinder or cylinders, check-valves being placed on these branch pipes, so as to admit the charging-water to the cylinder, but prevent its return, and air-cocks applied at the highest point of each compartment of the water cylinder or cylinders to allow the air to escape to the atmosphere during the force-stroke of the plunger, but to prevent the air returning during the suction-stroke. This construction is not satisfactory, because there are air-spaces in the pipe between the check-valve on the small charging-pipes and the points at which they enter the compartments of the water-cylinder, which when filled or partially filled with air causes an irregular and slamming action of the pump and a fluttering and pounding of the valves, resulting eventually either in their destruction and the disabling of a fire-pump at a critical moment or rendering it dangerous and often impossible to run up to the normal speed and capacity. The construction also is complicated in appearance and expensive in construction and on account of the several fittings and joints is liable to air leakage and consequent impairment of action, even if the charging should be successfully accomplished.

In accordance with the present invention I apply to each cylinder a charging-chamber, preferably formed of a single casting and having two valves opening into the water-cylinder at its highest point and air-relief valves arranged to open from a point just opposite or inside the valves and connect the charging-pipe to this chamber. By this construction there is no air-space beneath the valves, so that there is no fluttering or pounding action due to the accumulation of air, and no air can collect beneath the valves momentarily, as the air-relief valves will discharge it. The construction, moreover, is simple, compact, and cheap, and the same size chamber may be used for all sizes of pumps and be made in quantities, effecting a material saving in the construction.

For a full understanding of the invention a detailed description of a construction embodying the same in its preferred form will now be given in connection with the accompanying drawings, forming a part of this specification, and the features forming the invention will then be specifically pointed out in the claims.

In the drawings, Figure 1 is a side view of the water end of a duplex fire-pump embodying the invention. Fig. 2 is a cross-section of the water-cylinders on the line 2 of Fig. 1. Fig. 3 is a detail vertical section taken on the line 3 of Fig. 2. Fig. 4 is a cross-section on the line 4 of Fig. 3.

A B are the water-cylinders on opposite sides of the duplex pump shown, C the suction and D the force chamber, having the suction and force valves *a b*, and E the partition through which the plunger F moves and which divides the cylinders into the two opposite end compartments, all of which parts may be of any suitable construction other than that shown.

Centrally of the length of the cylinders A B are mounted upon the ledges *c*, formed at the tops of the cylinders, the castings *d*, forming the charging-chambers and containing the charging-valves, and which are preferably constructed as follows: The casting is tapped at one end for the charging-pipe *e* and is provided with two valves 1, opening downward and controlling communication between the charging-chamber and ports 2, which enter

the cylinder on opposite sides of the partition E and form the valve-chambers for valves 1, these valves 1 preferably being the common rubber spring-seated valves opening downward under the priming pressure and closed after charging by the cylinder-pressure and springs 3 on valve-stems 4, although any other suitable valves may be used. The casting d is provided just inside the valve-seats with openings 5, communicating with the atmosphere through air-relief valves 6, which may be of any suitable form of check-valve arranged, as usual, to permit the air to pass outward from the cylinder, but prevent its return.

The operation of the construction will be understood without detail description, it being obvious that the charging-valves 1 will be opened by the charging pressure on the outside of the valves in charging the cylinders and closed by the pressure inside the cylinders after charging and that any air which may momentarily collect beneath the valves 1 will be at once removed through air-relief valves 6.

What is claimed is—

1. The combination with the pump-cylinder

A having ports 2 communicating with the cylinder-compartments at the top of the cylinder, of charging-chamber d separate from the force-chamber mounted on the cylinder above said ports, charging-pipe 3 connecting with said chamber for supplying liquid for charging the pump, charging-valves 1 controlling communication between the charging-chamber and ports 2, and air-relief valves permitting the escape of air from the top of the cylinder, substantially as described.

2. The combination with the pump-cylinder A having ports 2 communicating with the cylinder-compartments at the top of the cylinder, of charging-chamber d mounted on the cylinder above said ports and charging-valves 1 controlling communication between the charging-chamber and ports 2, and air-relief valves opening from inside said charging-valves, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHAS C. WORTHINGTON.

Witnesses:

HOSEA WEBSTER,

LOUIS R. ALBERGER.