

(No Model.)

2 Sheets—Sheet 1.

T. E. MARTIN.
FORCE PUMP.

No. 599,004.

Patented Feb. 15, 1898.

Fig. 1.

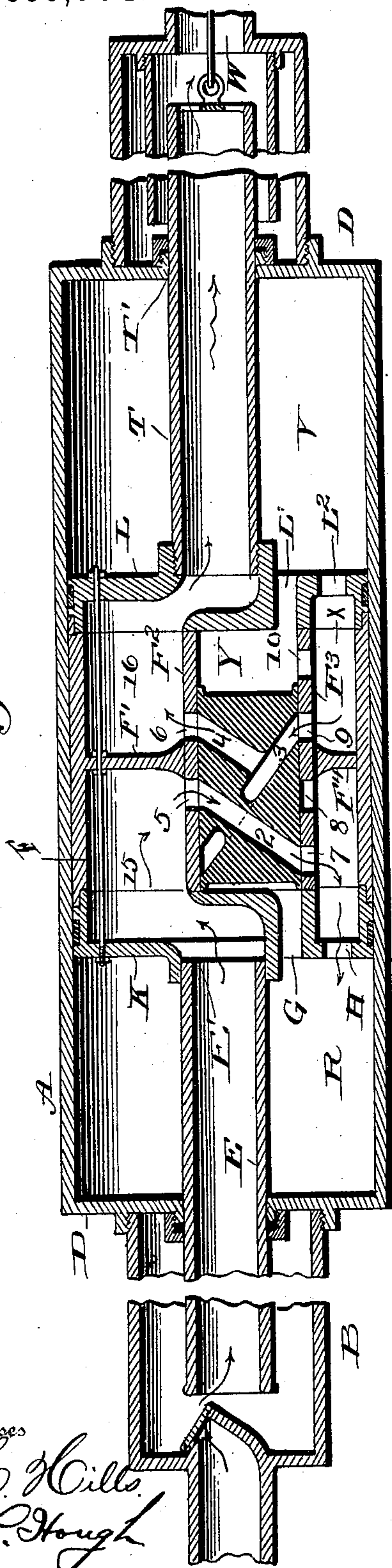
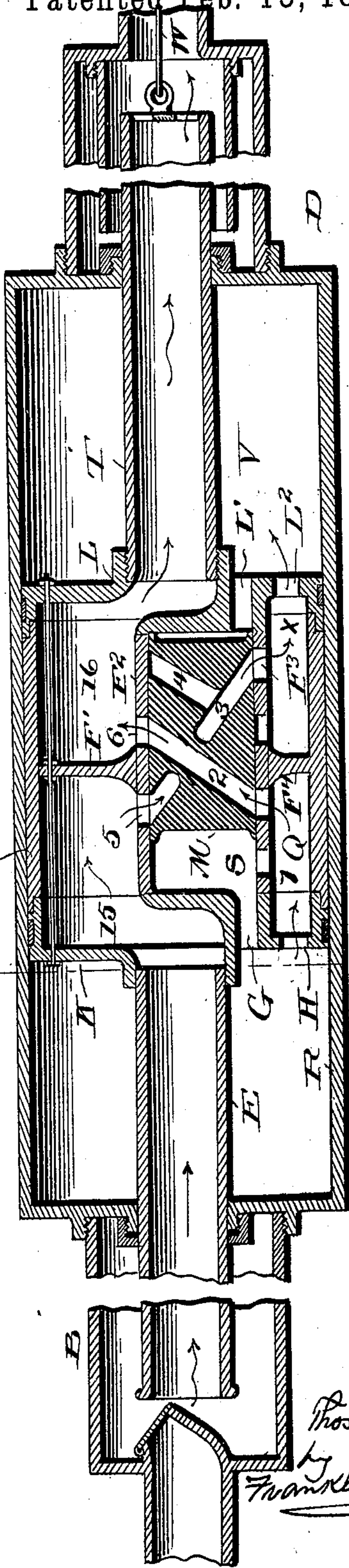


Fig. 2.



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2 Sheets—Sheet 2.

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Fig. 6.

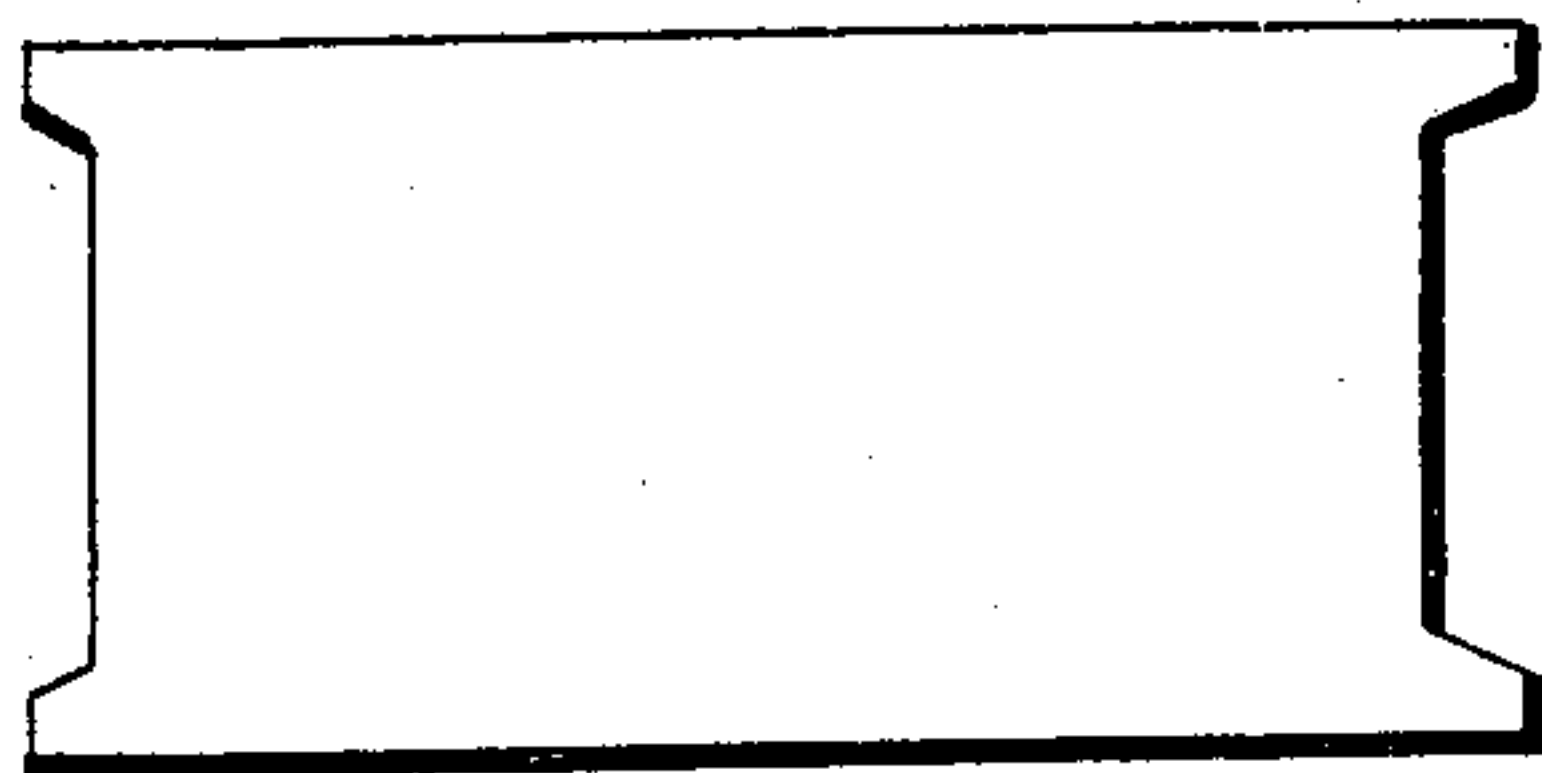


Fig. 4.

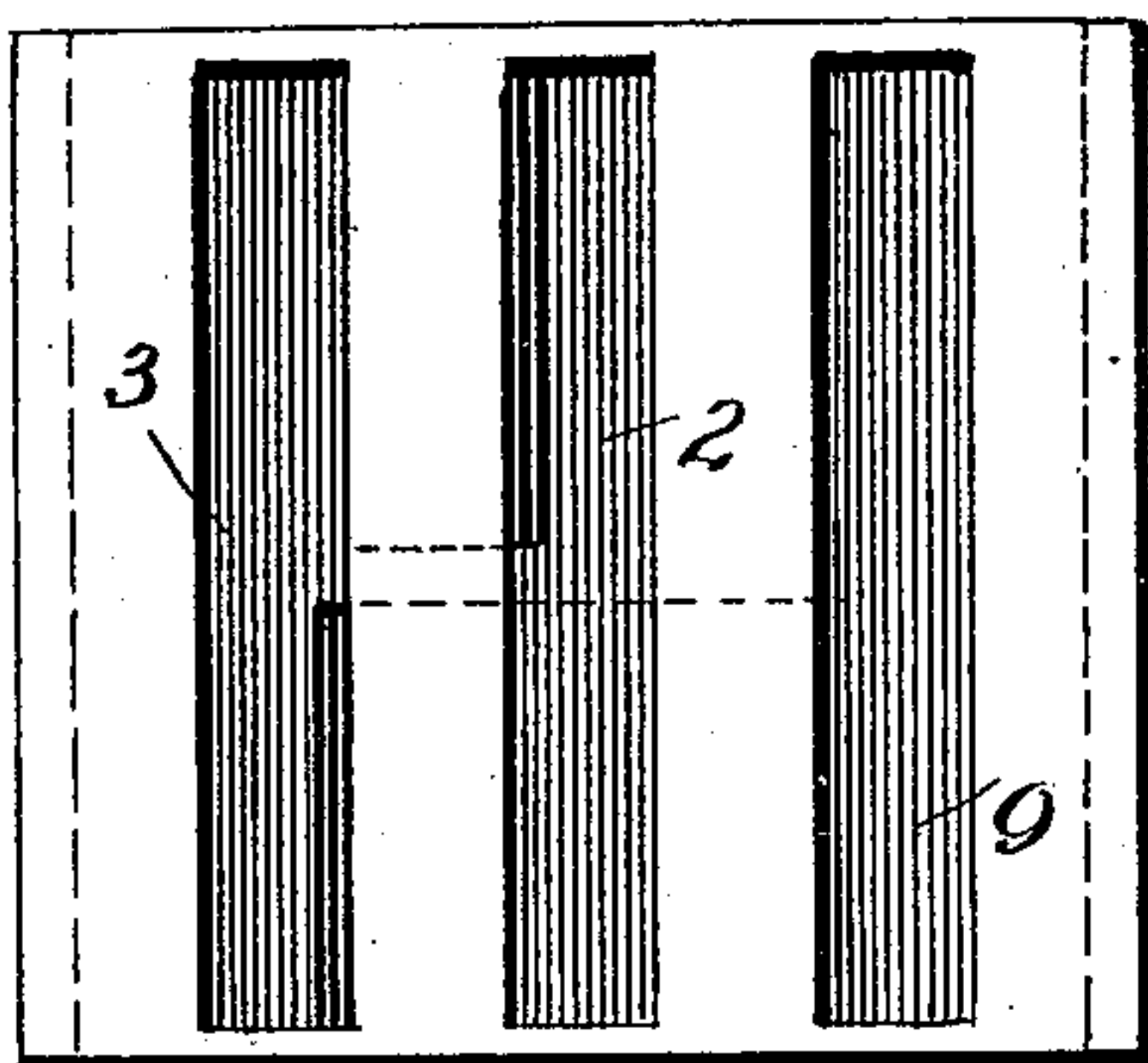


Fig. 5.

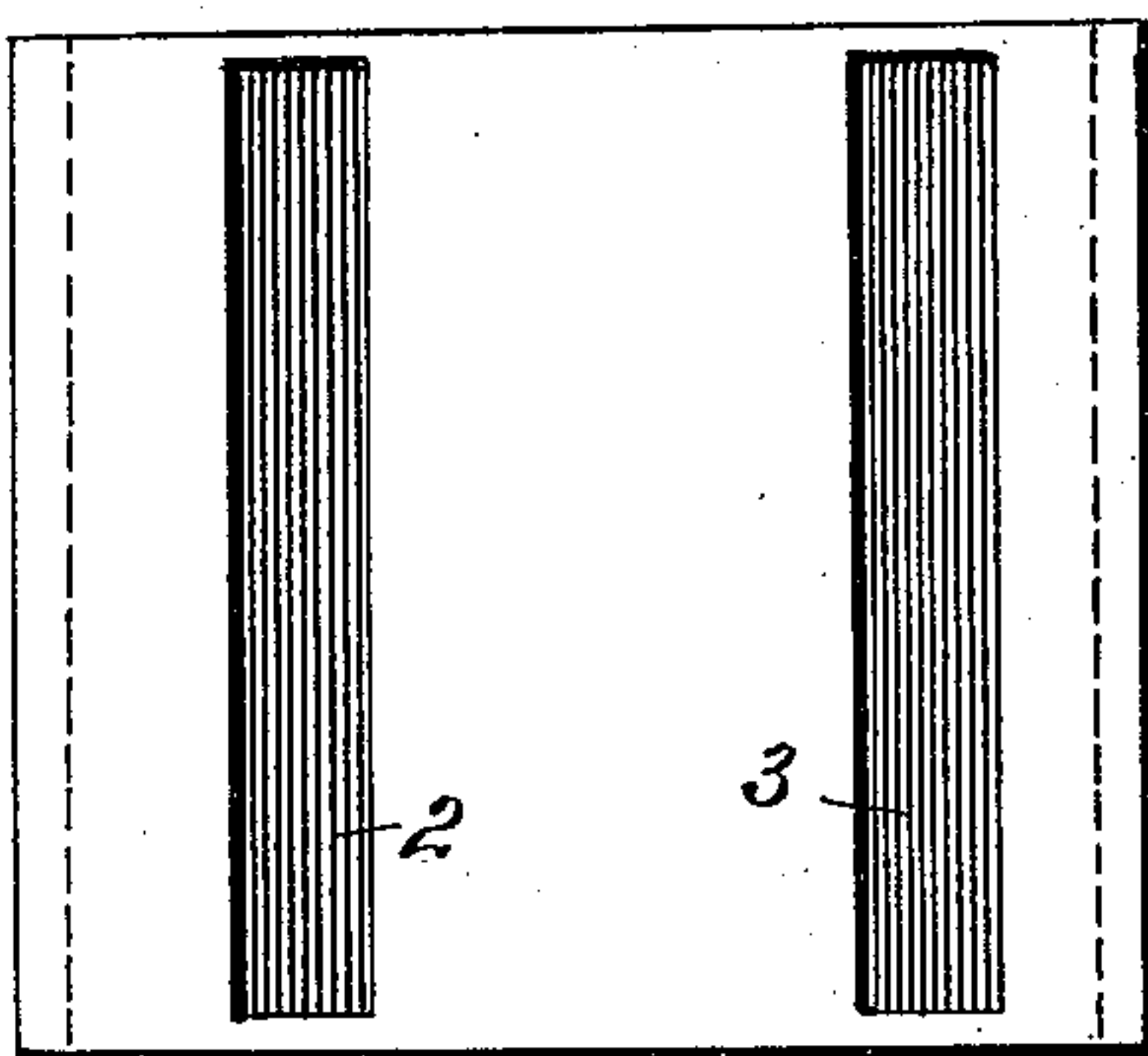
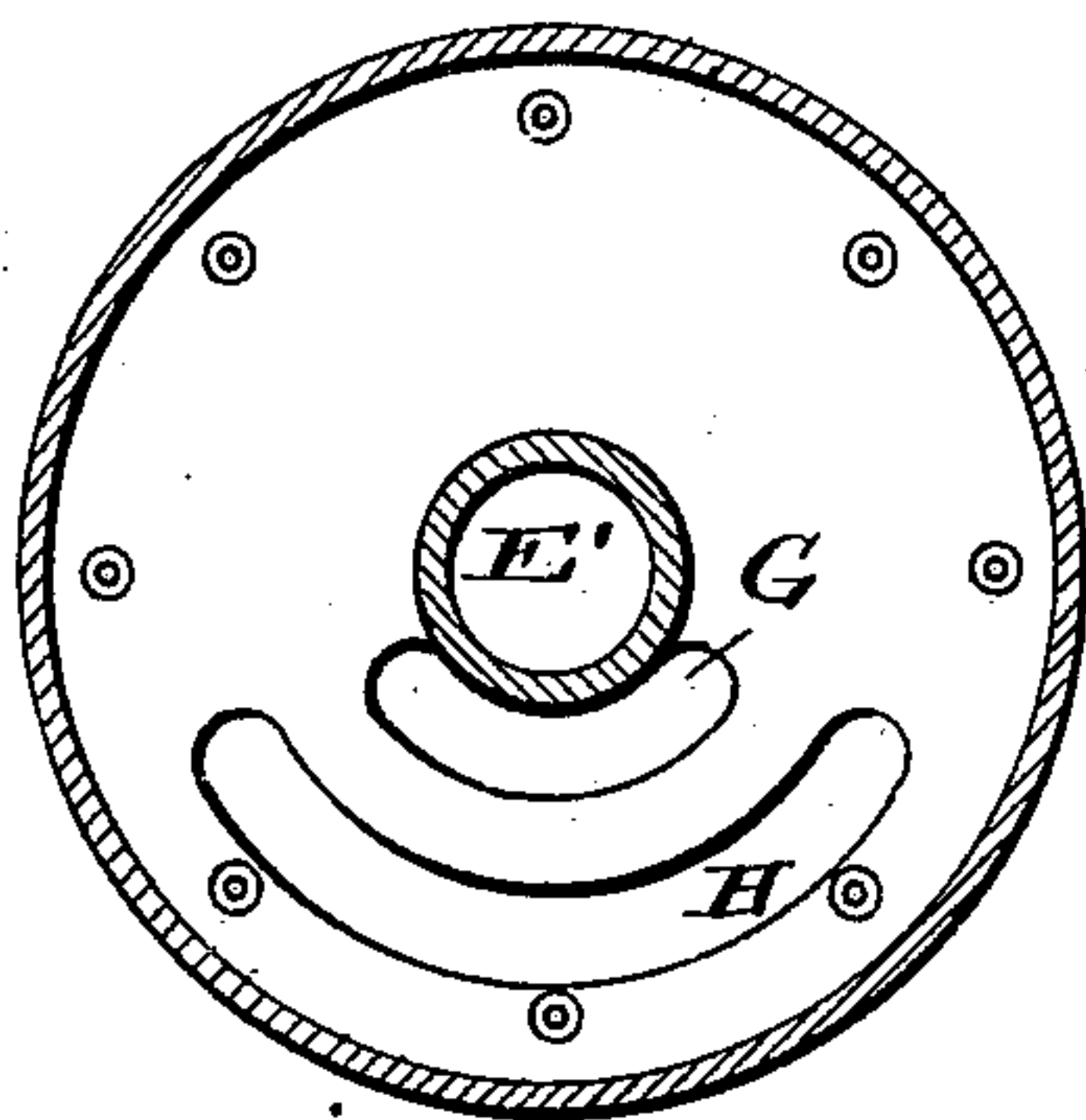


Fig. 3.



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UNITED STATES PATENT OFFICE.

THOMAS EUGENE MARTIN, OF NORTH RUSH, NEW YORK.

FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 599,004, dated February 15, 1898.

Application filed July 30, 1897. Serial No. 646,526. (No model.)

To all whom it may concern:

Be it known that I, THOMAS EUGENE MARTIN, a citizen of the United States, residing at North Rush, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Continuously-Flowing Force-Pumps; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in pumps, and especially to a continuously-flowing force-pump with but one valve in which the suction and pressure at the opposite ends of the sliding valve serve to automatically actuate the same to present the proper ducts in such registering relations as to cause a continuous flow of water from the hollow suction-pipe through the piston-heads and to the delivering-pipe.

More specifically my invention consists in the provision of a continuously-flowing force-pump having a compartment-piston suitably partitioned and containing a sliding valve having a peculiar arrangement of passage-ways through the same, whereby as the valve is reciprocated the said passage-ways are caused to register with ducts on opposite sides of the partitions of the piston, so as to cause a continuous flow of water through the pump, the pressure and suction at the opposite ends of the piston serving to hold the valve at the limit of its throw as the piston is operated, the valve cutting off and opening without any possibility of a backflow.

To these ends and to such others as the invention may pertain the same consists, further, in the novel construction, combination, and adaptation of the parts, as will be hereinafter more fully described, and then specifically defined in the appended claim.

The invention is clearly illustrated in the accompanying drawings, which, with the letters and figures of reference marked thereon, form a part of this specification, and in which drawings similar letters and figures of reference indicate like parts throughout the several views, in which—

Figure 1 is a central longitudinal sectional view through the improved pump, showing the sliding valve at its farthest throw at one end of the piston. Fig. 2 is a similar sectional view through the pump, showing the valve reversed or at the limit of its throw at the opposite end of the piston. Fig. 3 is an end view of the piston, showing the ducts therein. Fig. 4 is a plan view of the top of the valve. Fig. 5 is a bottom plan view of the valve, and Fig. 6 is an end elevation of the same.

Reference now being had to the details of the drawings by letters and figures, A designates the outer shell of the pump-cylinder, to the ends of which are secured the inlet-passage B, and at the inlet of same is a check-valve, and the outlet-passage with water-tight connections with the ends D of the cylinder. Through the cylinder-head works a hollow suction-tube E in a suitably-packed aperture in the cylinder-head, and the inner end of the said tube is secured to the walls of an aperture E' in one end of the piston. The piston-head K has the ducts or recesses G and H, the purposes of which will be hereinafter described. The piston is made up, preferably, of the ends K and L, of similar construction and are held to a cylindrical shell F, and within the piston-chamber are the partitions F', F², F³, and F⁴.

Mounted within the piston-chamber and between the parallel partitions F² and F³ is the reciprocating valve M, having the ducts or passage-ways 2, 3, and 4, the two ducts 2 and 3 crossing each other without communicating, while the duct 4 leads into duct 3. As seen in the detail views, Figs. 4 and 5 of the drawings, the upper face of the valve has three openings or ducts, while the under face has but two, and at each end are projections F⁵ to prevent the entire surface of the ends of the valve contacting with the piston-heads. In the partition-wall F² are the ports 5 and 6 and in the lower portion are the ports 7, 8, 9, and 10. Communication between the compartment Q and the space R between the left end of the piston and the end of the cylinder is had through the port H, and the port G leads from the compartment S to the space R.

Both ends of the piston are similarly constructed, the end L having the outlet-pipe secured to the piston end and working through a suitably-packed aperture in the end of the

cylinder at T', as plainly seen in the drawings, and ports L' and L² communicate between the space V outside of the piston-head and the space Y at one end of the sliding valve and the compartment X, respectively.

At the outlet end of the pump a suitable pump-rod W may be connected to the end of the outlet-tube T in any suitable manner, or the said tube T extended may act as a pump-rod, provision being made to allow the water to freely pass out about the connection of the said rod and to the spout, the latter not being shown in the drawings.

In operation in Fig. 1 the piston is supposed to be passing to the right, the valve being held in the position shown by means of the suction from the space R drawing the valve against the end of the piston, while at the opposite end of the valve there is a pressure exerted by the water which is contained in the space V being forced out through the ports L' and L². In the position shown in Fig. 1 the water enters through the aperture E', to which the water is conducted in the inlet-tube E, into the chamber 15, and thence passes through the duct 5 into passage-way 2, through the port 7 into compartment Q, thence into the space R between the left end of the piston and end of pump-cylinder. When the piston is reversed, the valve assumes the position shown in Fig. 2—that is, at the opposite end of the piston-chamber—by reason of the suction being exerted on the right end of the valve and pressure at the opposite end. When the valve is in the position shown in Fig. 2, in the backward movement of the piston the water that has been drawn by suction into the space R will be forced through the passage 2 into the chamber 16, and the water which enters the compartment 15 in the reverse movement of the valve will be drawn through the passage-way 3, the current entering chamber or space V through ports 10

and L² to fill the space formed by the partial vacuum as the valve and piston move to the left. The water contained in the chamber V in Fig. 1 as the valve passes to the left is forced through the ports L' and L², 9 and 10, and through the passages 3 and 4 into the chamber 16, and thence out through the outlet-tube T, and so on to the spout. In the successive movements of the piston backward and forward the same operation is repeated, and thus is produced a continuous flow of water through the pump.

The construction of pump which I have described is intended to work in a horizontal position, but may be adapted for use in a vertical or other position with slight alterations, which will not depart from the spirit of the invention.

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

In a pump, the combination with the pump-cylinder, the piston-cylinder F, working therein, the heads K and L secured to the said piston-cylinder, the supply and outlet pipes secured to the said heads, and working through suitable packed apertures in the ends of the pump-cylinder, partitions F', F² and F³ in the shell of the piston, a valve designed to reciprocate between the said partitions F³ and F², and having diagonally-disposed ducts through the valve, which are designed to register with ports in their partitions, the chamber beneath the chamber F³, having suitable ports between the same, and the interior of the pump-cylinder, all arranged substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS EUGENE MARTIN.

Witnesses:

E. H. MARTIN,

EDWIN P. CLAPP.