

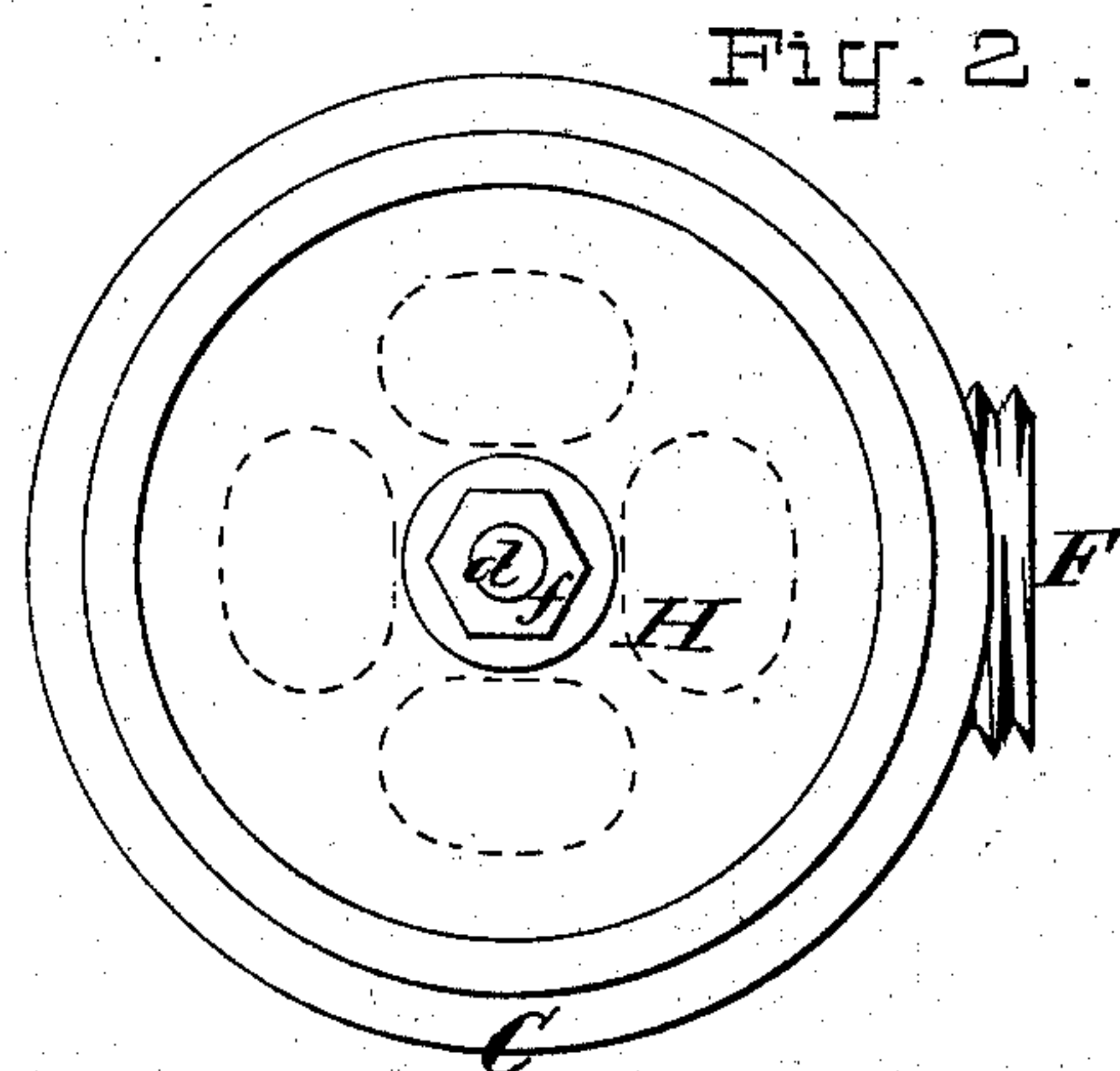
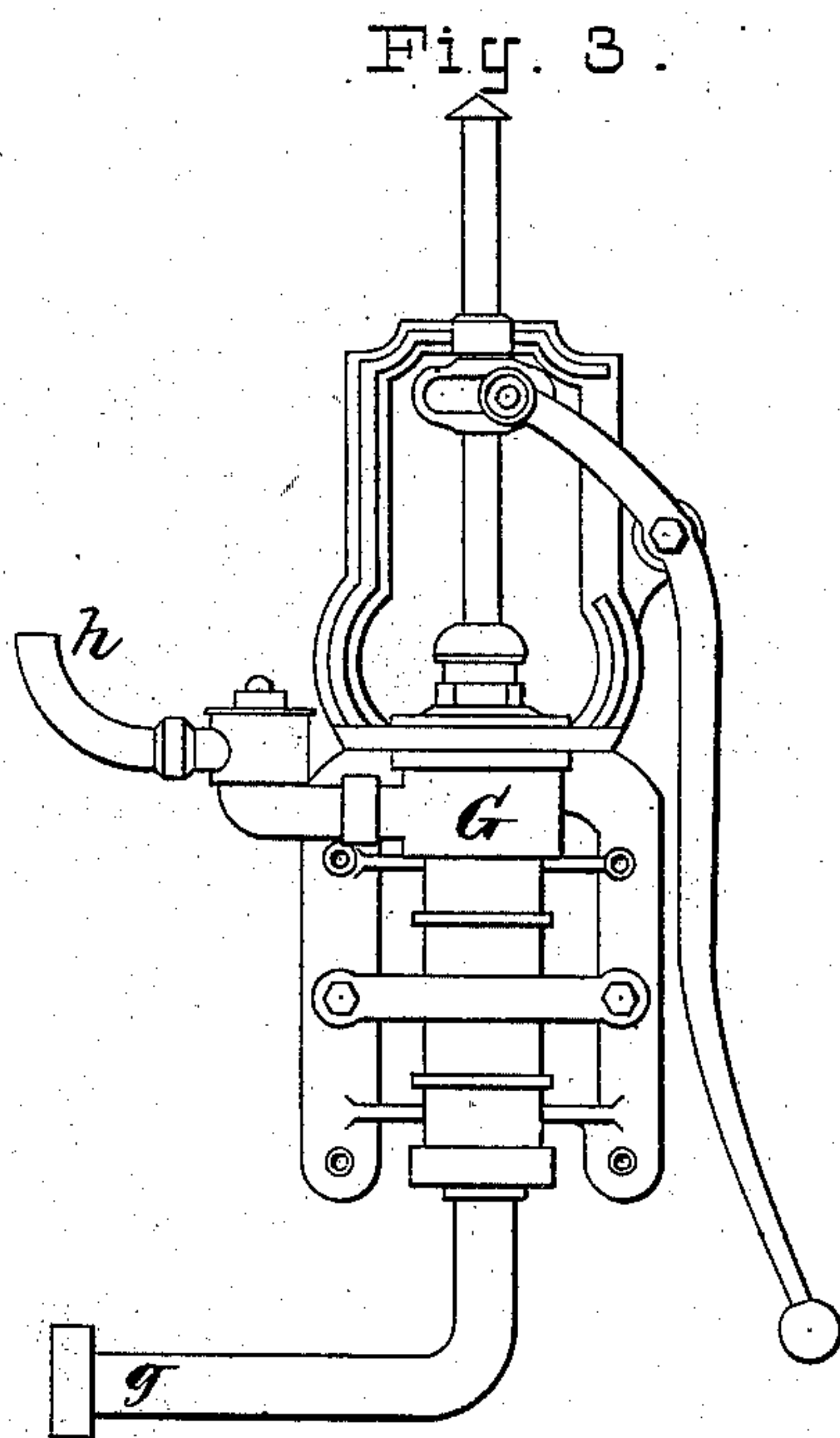
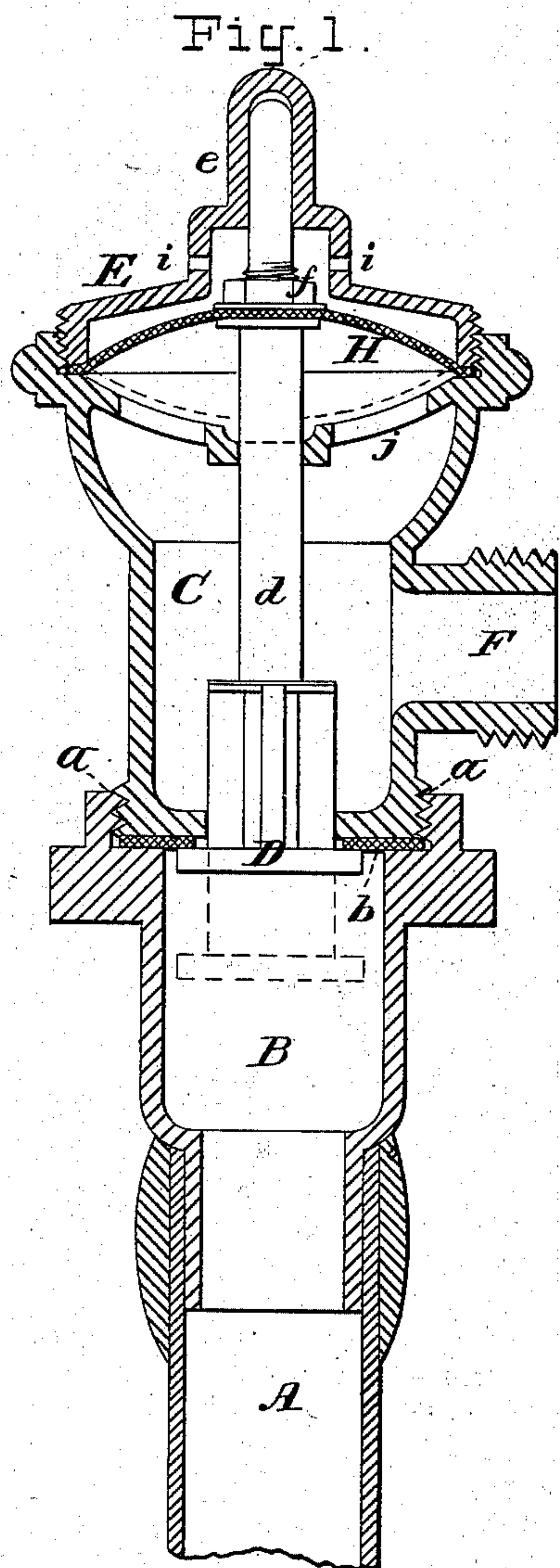
(Model.)

J. E. BOYLE.

STOP VALVE FOR HOUSE PUMPS.

No. 249,578.

Patented Nov. 15, 1881.



ATTEST :

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STOP-VALVE FOR HOUSE-PUMPS.

SPECIFICATION forming part of Letters Patent No. 249,573, dated November 15, 1881.

Application filed April 16, 1881. (Model.)

To all whom it may concern:

Be it known that I, JAMES E. BOYLE, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Stop-Valves for House-Pumps, of which the following is a specification.

This invention relates to an automatic stop-valve to be employed in connection with a house-pump. In some localities, where water is supplied to the different floors of the buildings through service-pipes, the water fails to rise to the basins during the day from various causes, and pumps are employed to lift it. At night, however, the water will rise, and, if the faucets be left open, will overflow the basins or sinks and cause serious trouble, besides a waste of water. The causes of this fluctuation in the water arise mainly from an insufficient supply and a deficient "head," the demand for water being mainly during the day, and very little being used at night. As the water will not flow of itself during the day, under such circumstances, the user, after pumping all that is needed, is apt to leave the faucet turned on, and this causes trouble at night when the flow begins, as the water flows readily through the pump.

To obviate the above defects I arrange an automatic stop-valve in the service-pipe below the pump, and preferably above the ordinary day-level of the water in said pipe, said valve being so arranged as to close automatically when the water rises at night and cut it off, but to permit the water to pass readily when the pump is in operation, all as will be more fully hereinafter set forth.

In the drawings, which serve to illustrate my invention, Figure 1 is a vertical mid-section of my improved valve, and Fig. 2 is a plan of the same with the cap removed, so as to show the diaphragm. Fig. 3 is a view, on a small scale, of a house-pump of the ordinary kind, adapted to be used in connection with my valve.

The stop-valve may be constructed in a variety of ways, all embodying the same principle of operation; but that I have here shown is simple and easily made.

Let A represent the water-service pipe, and B a receiver attached thereto, preferably by an ordinary "wipe-joint." The upper part of this

receiver has an internal screw-thread at *a*, to receive a water-chamber, C, which is screwed therein. When screwed together the two parts B and C clamp between them a gasket, *b*, of rubber, leather, or similar material, to form a valve-seat around the valve-opening in the bottom of the chamber C. D is a valve, which has a stem, *d*, that passes up into a guide at *e* in the screw-cap E of the water-chamber. F is the outlet to the pump G, and through it to the faucets. When screwed into the chamber C, the cap E clamps a diaphragm, H, preferably of rubber, down onto a shoulder in the rim of the chamber and binds fast its edge. The stem *d* of the valve passes through the diaphragm, and the latter is clamped tightly thereto by means of a nut, *f*, as shown. The suction-pipe *g* of the pump is coupled to the outlet F of the stop-valve chamber, and the outlet-pipe *h* of the pump leads to the basins or faucets.

So far as described the operation of the valve is as follows: During the night, when the water rises in the pipe A, it passes through the valve-opening in the bottom of the chamber C, (the valve D standing normally, as indicated by the dotted lines,) and out through the outlet F to the pump. This gives the water head enough to fill the chamber C and create a little pressure therein, and this pressure, acting upward on the diaphragm H, (which has an area greater than that of the valve D,) lifts the valve to its seat and cuts off the incoming water. As soon as the pressure in the mains is reduced and the water falls, the valve again drops to its former position, (indicated by the dotted lines.)

The pump may be used at any time, no matter what may be the condition of the valve, as the first stroke of the pump exhausts the water from the chamber C, and the diaphragm H is forced downward by the pressure of the external air behind it, which enters at the openings *i i*. When the diaphragm falls it rests upon a bridge or support, *j*.

To operate successfully it is important that the diaphragm H have a much greater area than the valve D, so that the latter may be closed promptly by the rising water and opened readily by the pump.

The pump shown represents one in common use, and I make no claim to it. Any kind of pump may be employed.

My stop-valve may be put in any position where it will be out of the way and out of sight, and as it works automatically it will not need to be touched or tampered with by any one, unless it fails to work from some cause. So long as the valve is between the pump and the street-main it is not important where it is set.

As an equivalent of the diaphragm a piston playing in a cylinder might be substituted; but as the friction of a piston is apt to be variable I prefer the diaphragm.

The stop-valve may stand in any position, and will work as well in one position as another.

Having thus described my invention, I claim—

1. An automatic stop-valve for houses where- in the water-supply has a fluctuating pressure and a pump is required, which consists of a casing inclosing a cut-off valve and its seat and a diaphragm, or its equivalent, of greater area than the valve, and connected with the stem of the same, an inlet for the water beyond the valve-opening, and an outlet between the valve and the diaphragm, whereby the back-pressure of water from the pump or pipe will lift the diaphragm and close the valve, thus cutting off the influx of water, substantially as set forth.

2. The combination, with a house-pump connected with the water-service pipe, of a stop-valve arranged between the pump and the main, composed of a cut-off valve actuated by the fluctuations of a diaphragm, or its equivalent, attached thereto, all arranged within a casing having an outlet to the pump between the dia-

phragm and the valve, whereby the suction of the pump by exhausting the water and air from the chamber allows the diaphragm to fall and open the valve, substantially as set forth.

3. The combination, to form an automatic stop-valve for water-service pipes of houses, of the chamber C, provided with a valve-opening and an outlet, F, the valve D, arranged to close the valve-opening, and the diaphragm H, or its equivalent, connected with the valve and adapted to open or close the valve-opening by its fluctuations, the outlet F being arranged between the valve and the diaphragm, substantially as set forth.

4. The combination, with the house-pump, of the automatic stop-valve composed of the chamber C, connected with the pipe A, and having an outlet, F, and a valve-opening in its bottom to admit water from the pipe A, the valve D, arranged to close said opening, the diaphragm H, connected with the stem of said valve, the cap E, provided with openings *i i*, to admit air upon the diaphragm, and the concave rest or support *j*, all arranged to operate substantially as and for the purposes set forth.

5. An automatic valve for house-pumps, arranged between the house-pump and the water-main, and arranged to prevent the water from rising to and escaping at the faucets when the pump is not in operation, as set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES E. BOYLE.

Witnesses:

ARTHUR C. FRASER,
HENRY CONNETT.