

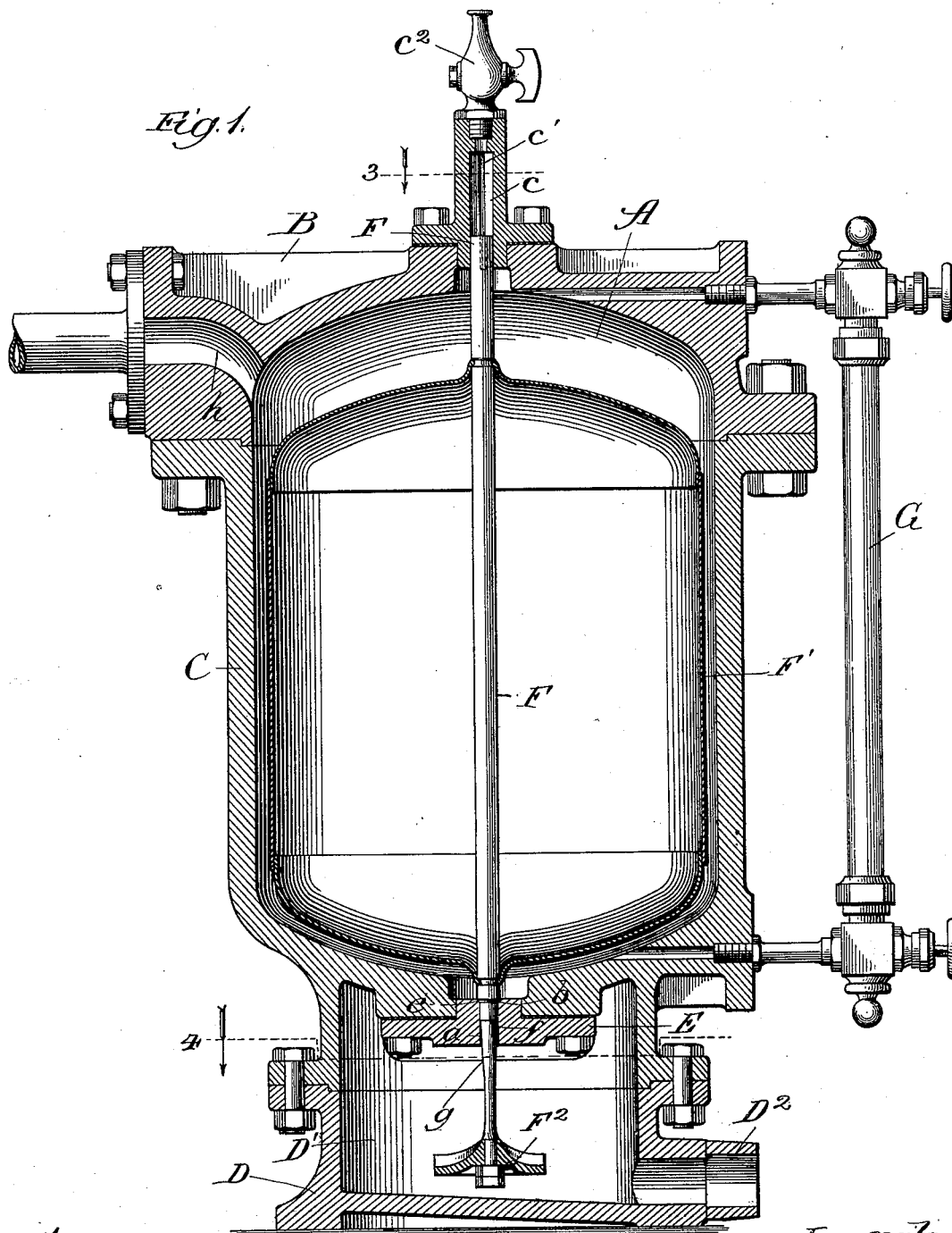
No. 648,180.

Patented Apr. 24, 1900.

J. STUMPF.
ROTARY FLOAT VALVE.
(Application filed Dec. 29, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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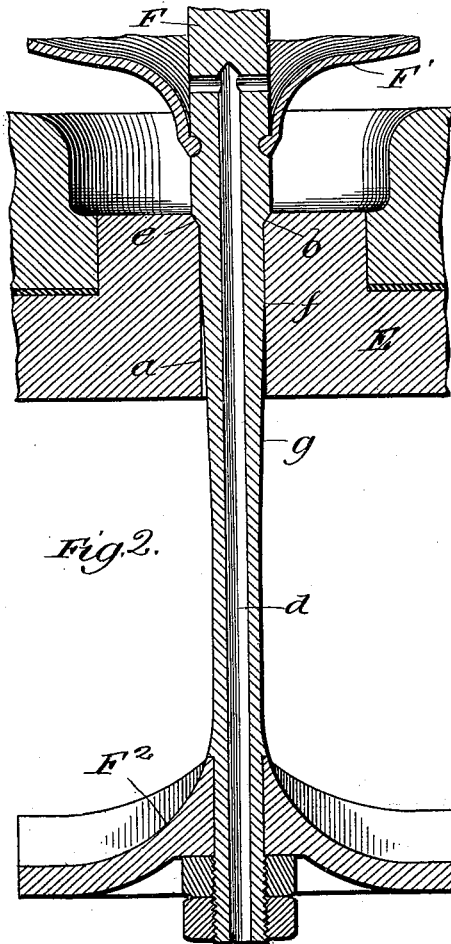


Fig. 2.

Fig. 3.

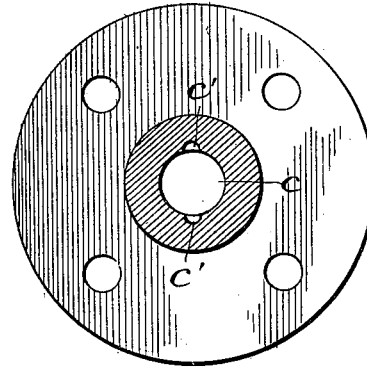


Fig. 4.

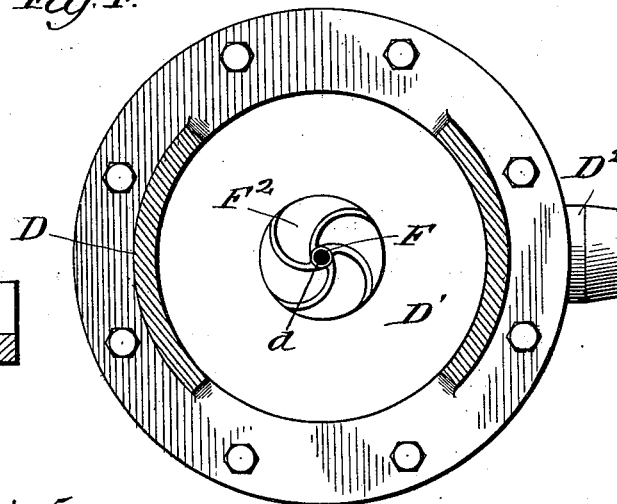
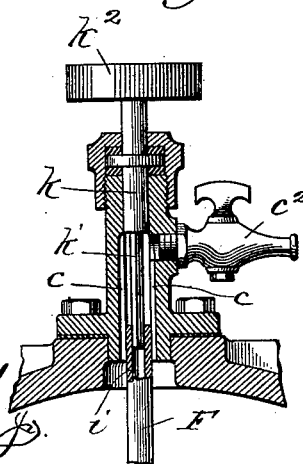


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN STUMPF, OF BERLIN, GERMANY.

ROTARY FLOAT-VALVE.

SPECIFICATION forming part of Letters Patent No. 648,180, dated April 24, 1900.

Application filed December 29, 1899. Serial No. 741,948. (No model.)

To all whom it may concern:

Be it known that I, JOHN STUMPF, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented a new and useful Improvement in Rotary Float-Valves, of which the following is a specification.

My invention relates to an improved valve device which while it may be used in any connection where its characteristics may render its employment advantageous is intended by me for use more especially in steam-traps.

Condensation-water from steam-traps and steam-engines frequently carries particles of sand or other hard material which lodge in the steam-trap valve and tend to interfere with the perfect working of its moving parts.

My object is to provide a float-valve which will tend to maintain a constant discharge of liquid and rotate under the force of the said discharge to maintain the valve clean and prevent its becoming clogged by the accumulation of sand or other foreign particles between its seating faces. It is also my object to so construct my improvements as to cause the rotating valve to perform the functions of a motor, from which power may be taken for useful purposes.

In the application of my invention to a steam-trap I provide the float-valve with a stem passing through the discharge-orifice of the trap, and on the stem beyond the said orifice I provide a turbine, whereby the opening of the valve is regulated by the float and the valve is rotated by the force of the discharge-water against the turbine.

In the drawings, Figure 1 is a vertical section of a constant-working turbine steam-trap constructed in accordance with my invention; Fig. 2, an enlarged and broken section of the lower part of the trap, showing the valve, valve-stem, and turbine; Fig. 3, an enlarged plan section taken on line 3 in Fig. 1; Fig. 4, a plan section taken on the irregular line 4 in Fig. 1, and Fig. 5 a vertical section of the upper part of the trap and illustrating a construction wherein the valve-spindle is provided with a pulley and performs the function of a motor.

A is a steam-tight trap-chamber having a casing consisting of a cover B and a cylindrical body portion C, resting upon a base D. In the base is a chamber D', open to the at-

mosphere and having a water-outlet D². The lower end of the chamber A is closed by a plate E, bolted in place and having a central discharge-opening *a* through it, which flares at the top to form a valve-seat *b*.

F is a stem or spindle passing toward its lower end through the opening *a* and extending at its upper end into a vent-passage *c* in the top of the casing. The spindle may rotate freely in the bearings *a* *c*, and in the sides of the latter are vertical vent-grooves *c'*, whereby the top of the spindle is open to the pressure in the chamber A, and the passage *c* is provided with a vent-cock *c*².

F' is a float fastened at opposite ends to the stem F in the chamber A. The float should be water-tight, but is provided with a drainage-opening *d*, which extends from the interior of the float downward through the lower end of the stem F, as indicated in Fig. 2, so that in the event that the float should leak the water would drain therefrom to the chamber D'. Below the float F' the stem or spindle F is provided with a circumferential valve-face *e* to fit the valve-seat *b*. For a short distance below the valve-face *e* the stem is of a diameter to fit closely the opening *a*. From the point *f* the stem tapers in the outward direction to form the gradually-reducing portion *g*. Fastened upon the lower end of the stem or spindle F is a turbine F² of suitable construction. On the side of the casing is a water-gage G.

Water enters the trap-chamber at a port *h* near the top, and as it accumulates in the chamber it raises the float F' and spindle and opens the valve *e* to permit the water to escape through the orifice *a*. The resistance to opening of the valve *e* is the weight of the float, spindle, and turbine supplemented by the steam-pressure against the top of the spindle in the passage *c*. As the water under pressure escapes through the orifice *a* it strikes the turbine F², causing the same to rotate and give turning motion to the spindle and float. When the inflow of condensed water to the chamber A exceeds the outflow, the rise of water in the chamber will cause the float to rise, and owing to the tapering shape of the stem at *g* the outlet will be enlarged and the escape of water proportionately increased. Thus a substantially-even

level of water in the chamber will be maintained. The rotation of the spindle in the orifice *a* causes it to disintegrate any particles of sand, gravel, or other impurities that
 5 may lodge between the moving surfaces, and in this way all the working parts are rendered free and danger of binding or sticking is obviated.

In the construction shown in Fig. 5 the spindle *F* is provided with a squared socket *i* to
 10 receive the squared part *k'* of a shaft *k*, which passes through a stuffing-box in the top of the passage *c* and carries a pulley or other drive-wheel *k*². The engagement of the spindle *F*
 15 with the shaft *k* permits the former to rise and fall without releasing its engagement with the latter.

The flow of water from the trap will be constant instead of intermittent, as has been
 20 usual in steam-traps as hitherto generally provided, and a substantially-even turning motion will be given to the turbine, spindle, and attendant parts. A fan or other machine capable of being operated from the wheel *k*²
 25 may be geared or belted thereto.

The purpose of the turbine is primarily to rotate the outlet-valve on its seat, and thus prevent its sticking or becoming clogged with impurities.

30 While I prefer to construct my improvements throughout as shown and described, they may be variously modified in the matter of details without departing from the spirit of my invention as defined by the claims.

35 What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a receptacle having a liquid-inlet and a liquid-outlet, a valve-seating at said outlet, and having a stem ex-
 40 tending through the same, a float in the re-

ceptacle governing said valve and a turbine on the stem actuated by the escape of liquid from said outlet to rotate the valve upon its seat for cleaning the same, substantially as described.

2. The combination of a chamber or casing
 45 provided with an inlet and having an outlet in its lower side forming a valve-seat, a float in the chamber, a stem connected with the float and passing through said outlet, a valve
 50 on the stem at said valve-seat and a motor on the stem, below the said outlet, actuated by the escape of water from said outlet to turn the said stem, substantially as described.

3. The combination of a chamber or casing
 55 provided with an inlet and having an outlet-orifice in its lower side forming a valve-seat, a spindle passing through said orifice and tapering in the downward direction to enlarge the outlet in its rise, a float in the chamber
 60 connected with the spindle, and a motor on the spindle below said orifice actuated by the escape of water from the said chamber to turn the spindle, substantially as described.

4. The combination of a chamber or casing
 65 provided with an inlet and having an outlet-orifice in its lower side forming a valve-seat, a spindle passing through said orifice and tapering in the downward direction to enlarge the outlet in its rise, a float in the chamber
 70 connected with the spindle, a motor on the spindle below said orifice actuated by the escape of water from the said chamber to turn the spindle, and a drive-wheel upon the spindle outside the said chamber, substantially as
 75 and for the purpose set forth.

JOHN STUMPF.

In presence of—

WOLDEMAR HAUPT,
 HENRY HASPER.