

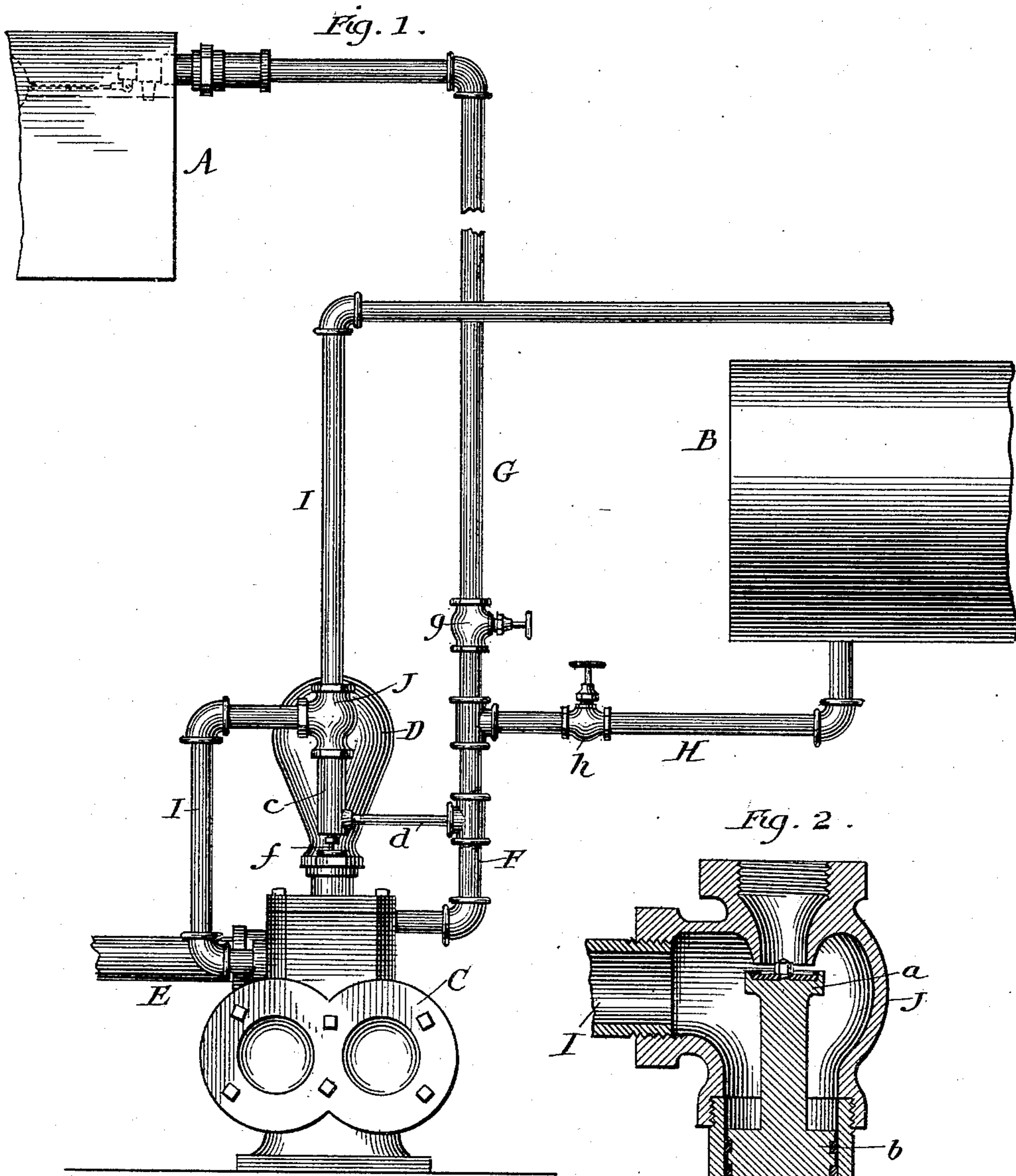
(No Model.)

J. W. STEVENS.

APPARATUS FOR FEEDING BOILERS OR WATER TANKS.

No. 427,633.

Patented May 13, 1890.



Witnesses:
Harry F. Jones.
Albert H. Adams.

Inventor:
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UNITED STATES PATENT OFFICE.

JOEL W. STEVENS, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF AND
ROBERT BINES, OF SAME PLACE.

APPARATUS FOR FEEDING BOILERS OR WATER-TANKS.

SPECIFICATION forming part of Letters Patent No. 427,633, dated May 13, 1890.

Application filed January 20, 1890. Serial No. 337,497. (No model.)

To all whom it may concern:

Be it known that I, JOEL W. STEVENS, residing at Chicago, county of Cook, State of Illinois, and a citizen of the United States, have invented a new and useful Improvement in Apparatus for Feeding Boilers or Water-Tanks, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation showing the manner of applying my improvements, and Fig. 2 is a central vertical section through the valve.

This invention relates to apparatus for feeding boilers or water-tanks of the class shown in Letters Patent No. 405,615, granted to me June 18, 1889; but it may be applied to other constructions.

The object of my invention is to provide means for regulating the amount of back-pressure necessary to close the valve in apparatus of this class, which I accomplish as illustrated in the drawings, and as hereinafter described.

That which I claim as new will be pointed out in the claims.

In the drawings, A represents a tank; B, a boiler; C, a pump; D, an air-chamber; E, a water-supply pipe leading to the pump; F, a water-discharge pipe leading from the pump; G, a pipe leading from the pipe F to the tank A; H, a pipe leading from the pipe F to the boiler B; I, a steam-pipe leading to the pump C from the boiler B, and J a valve-case in the pipe I.

The arrangement of the tank, boiler, pump, and pipes connected therewith may be varied to suit the building in which the apparatus is located. The boiler may be any style of boiler, and the tank A may be situated at any elevation. The discharge-pipes G and H may be provided with any suitable discharge-controlling devices, such as the floats shown in my former patent. The flow of water from the pipe F may be to the boiler B through the pipe H, or to the tank A through the pipe G, the pipes G and H being provided with suitable valves *g* *h*, respectively, to control the flow, as desired.

a is a valve in the case J. As shown, it seats upward against a seat in the case J, to

shut off the steam from the boiler to the pump. The arrangement shown of the valve and its case is the best known to me, and in most instances will be found the most convenient; but it is evident that the form of case J and the arrangement of its inlet and outlet ports may be varied to suit a different arrangement of the pipe I.

b is a piston connected with the stem of the valve *a*. This piston is located in a tube or cylinder *c*, coupled to the valve-case J, as shown; but it is evident that the cylinder *c* and valve-case J may be made integral.

d is a pipe leading from the discharge-pipe F into the cylinder *c* beyond the piston *b*, as shown in Fig. 2.

e is a spring supported upon a screw-threaded rod *f*, which passes through a cap on the end of the cylinder or tube *c*. This spring *e* abuts against the head *i* on the inner end of the rod *f* and against a support *j*, secured upon the piston *b*. The support *j* should be at a sufficient distance from the piston *b* to allow the valve to open and close, and to permit the rod *f* and spring *e* thereon to be adjusted, as hereinafter set forth. The valve, valve-stem, piston, and spring, which are the only parts which move in operation, are wholly within the valve-case and cylinder, and an adjusting-rod is the only part which projects through the case or cylinder. This construction obviates the use of a stuffing-box and protects the movable parts from outside interference.

The valve *a* will be opened by the steam in the pipe I to start the pump, and will be closed by the back-pressure of the water on the piston *b* to stop the pump, as described in my former patent.

The steam in the pipe I holds the valve *a* in my improved device open, while its pressure on the valve *a* and the tension of the spring *e* exceed the back-pressure of the water in the pipe F on the opposite side of the piston *b*. When the back-pressure of the water in the pipe F is increased sufficient to move the piston *b* against the steam-pressure and the tension of the spring *e*, the valve *a* will be seated, shutting off the steam-supply and stopping the pump. The amount of back-pressure in the pipe F, and consequently upon

the piston *b*, will depend upon the length of the pipe and the height of its water column. The valve might be closed by the weight of the water column or great back-pressure in the pipe *F* before the tank was filled and when it was desired to have the pump stop. I overcome enough of this large constant back-pressure by means of the spring *e*, whose tension must be overcome before the piston *b* is moved to close the valve *a*, to cause the valve to be closed when the back-pressure reaches a certain point. The amount of the back-pressure will vary with the pressure in the boiler *B*, and when the water in the tank *A* is under pressure it will also vary with the pressure in the tank *A*. The pressure of the steam on the valve will also vary with the pressure of the steam in the boiler. To overcome these variations, I adjust the tension of the spring *e* by means of the screw-threaded rod *f*, as may be required.

It will be seen that any increase in the back-pressure can be compensated for by the spring *e*, and any variation in the steam-pressure or back-pressure can be quickly compensated for by adjusting the spring *e* by means of the rod *f*, and that the relation of pressure and back-pressure can be adjusted by means of the spring and rod to allow the valve to open or close at any desired point.

In some instances a weight may be used instead of a spring.

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

1. The combination, with a water-receiving vessel and a supply-pump connected therewith, of a valve-section located in the steam-supply pipe of the pump, normally held open by the steam-pressure and adapted to be automatically closed by the back-pressure from the water-supply pipe to the tank to cut off the steam-supply, and a spring for overcoming a part of the back-pressure, substantially as specified.

2. The combination, with a water-receiving vessel and a supply-pipe connected therewith, of a valve-section located in the steam-supply pipe of the pump, normally held open by the steam-pressure, and adapted to be automatically closed by the back-pressure from the water-supply pipe to the tank to cut off the steam-supply, a spring for overcoming a part of the back-pressure, and means for adjusting the tension of the spring, substantially as and for the purpose specified.

3. The combination, with a valve-case and valve therein, of a cylinder and piston in said cylinder for closing the valve by back-pressure thereon, an adjusting-rod projecting through the cylinder, and a spring in said cylinder abutting against the piston and rod, whereby the amount of back-pressure necessary to close the valve may be regulated, substantially as specified.

JOEL W. STEVENS.

Witnesses:

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HARRY T. JONES.