No. 646,083 Patented Mar. 27, 1900.

E. J. STRONG.

AUTOMATIC FEEDER FOR STEAM BOILERS.

(Application filed Apr. 8, 1899.)

(No Model.)

Fig. 1.

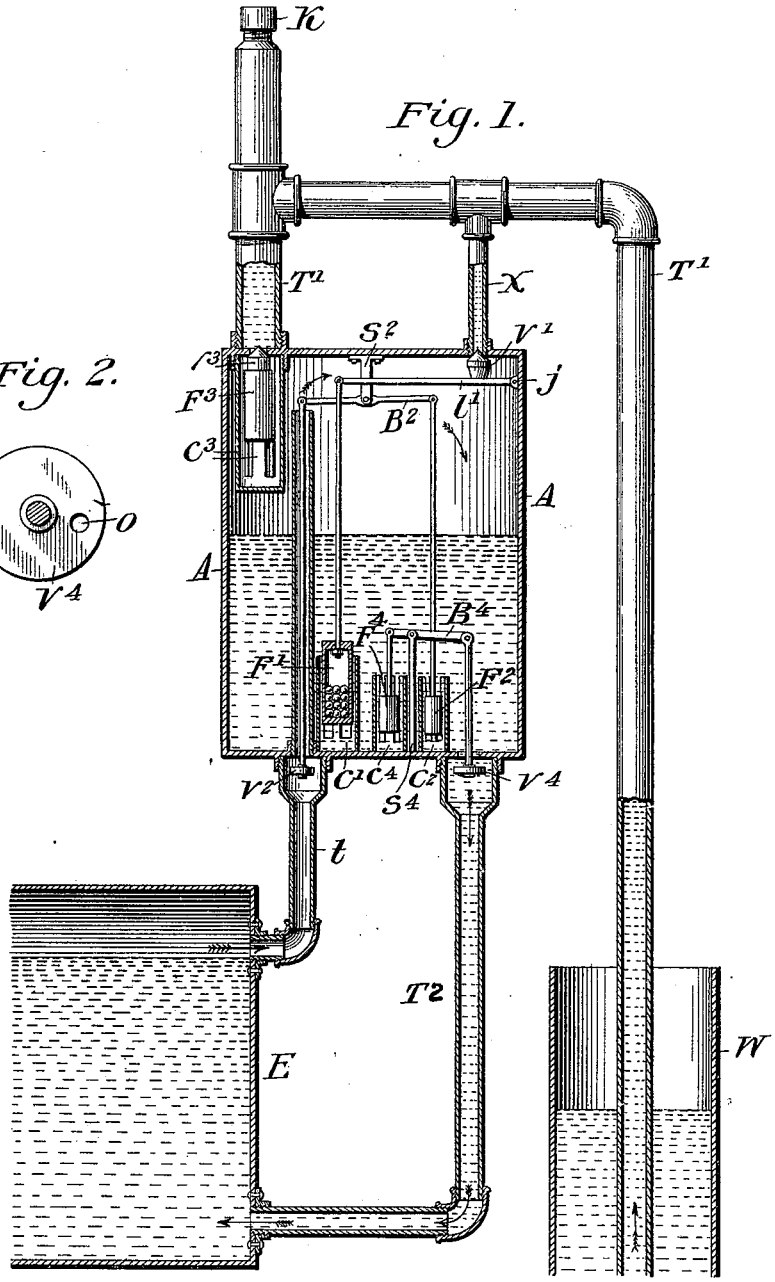

Fig. 2.

Witnesses.

Archie M. White

P. Steary

Inventor.

Edwin J. Strong

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDWIN J. STRONG, OF PLOVER, IOWA.

AUTOMATIC FEEDER FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 646,083, dated March 27, 1900.

Application filed April 8, 1899. Serial No. 712,341. (No model.)

To all whom it may concern:

Be it known that I, EDWIN J. STRONG, a citizen of the United States, residing at Plover, in the county of Pocahontas and State of Iowa, have invented a new and useful Automatic Feeder for Steam-Boilers, of which the following is a specification.

The object of my invention is to provide an automatic feeder for steam-boilers which will carry water into a steam-boiler when the water in the boiler is under steam-pressure and keep the water near a certain predetermined height in the boiler without the aid or attention of an engineer or attendant.

In the drawings, Figure 1 is a sectional view of the feeder connected with the steam-space of a boiler E by a steam-pipe t and with the water-space of the boiler E by a water-pipe T^2 and connected with the source of water-supply W by the inlet-pipe T′, and Fig. 2 a top view of the perforated or leaking valve v^4.

In Fig. 1 the cylindrical receptacle or steam-chamber A is connected with the steam-space of a boiler E by a steam-pipe t, which extends upward into the cylinder A and is provided with a valve v^2, pivotally attached to a lever B^2, suspended by its fulcrum s^2, and to the opposite end of said lever B^2 is pivotally attached a float F^2 in a cage c^2. The water-space of the boiler E is connected with the cylinder A by the water-pipe T^2, having a perforated or leaking valve v^4, (top view shown in detail, Fig. 2,) which allows water to flow from cylinder A into the boiler E through the pipe T^2, but prevents it from flowing in the opposite direction except in a small stream. Said valve v^4, having a leak-hole o, is pivotally attached to a lever B^4, which is supported upon its fulcrum s^4, and to the opposite end of the lever B^4 is pivotally attached a float F^4 in a cage c^4.

The source of water-supply or tank W is connected with the cylinder A by a water-inlet pipe T′, provided with a valve v^3 upon a float F^3 in a cage c^3. The interior of cylinder A and water-inlet pipe T′ are also connected by a steam-pipe x, which is provided with a valve v' upon a lever l', which is pivotally attached to cylinder A at j, and to its opposite end is pivotally attached a weighted float F′ in a cage c'.

K is a cap-screw on top of inlet-pipe T′.

The operation consists in having the boiler E filled with water to above the open end of the steam-pipe t in the boiler E and the entire feeder filled from the boiler E to the source of water-supply W. Then as the water boils down below the open end of steam-pipe t in the boiler E steam is free to pass upward through pipe t into cylinder A, and the water in cylinder A is free to flow downward by gravity and seek its level in the boiler E. When nearly all the water in cylinder A is exchanged for steam, the weighted float F′ pulls down on the long end of lever l', and thereby opens steam-pipe x, which gives vent to the steam in cylinder A, which causes a sudden draft of steam and water up through steam-pipe t and water-pipe T^2, which instantly shuts their valves v^2 and v^4, and as steam continues to pass through steam-pipe x the steam-pressure upward is relieved from valve v^3, which drops open, and the water in the inlet-pipe T′, between valve v^3 and steam-pipe x, flows down through cage c^3 and commingles with steam in cylinder A, which suddenly condenses, forming a vacuum in cylinder A and in the inlet-pipe T′, which soon entirely fills with water from the source of water-supply W. When cylinder A fills with water, the float F′ brings valve v' up and closes steam-pipe x, and float F^3 brings valve v^3 up and closes the inlet-pipe T′. Then as water gradually leaks up through the perforated valve v^4 the boiler-pressure upward against valve v^4 and valve v^2 is permitted to pass up through into cylinder A, and thereby relieve valve v^4 and valve v^2 from steam-pressure upward, and consequently open steam-pipe t and water-pipe T^2. Now cylinder A is again filled with water, and its pipes which communicate with the interior of the boiler E are open, and cylinder A is again ready to give the boiler E water in exchange for steam until the open end of steam-pipe t in the boiler E is flooded with water, which stops its operation until the water again boils down.

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

1. In an automatic feeder for steam-boilers, the combination with the chamber A, the boiler E and a source of water-supply W of

the steam-pipe t connecting the steam-space in said boiler E with said chamber A and extending vertically to near the upper end of said chamber A; the water-pipe T^2 connecting the lower end of said chamber A with the lower portion of said boiler E; the fulcrum s^2 depending from the lower face of the upper head of said chamber A; the lever B^2 pivoted in said fulcrum s^2 and provided with a rod having a valve v^2 adapted to work in the enlarged upper end of said steam-pipe t; the lever l' provided with a valve v' for opening and closing the steam-pipe x communicating with the inlet-pipe T'; the cage c' rising from the bottom of said chamber A; the weighted float F' connected with said lever l' and adapted to work in said cage c'; the lever B^4 supported on the fulcrum s^4; the perforated valve v^4 located in the upper end of the water-pipe T^2 and pivotally connected by a valve-rod with said lever B^4; the cage c^3 connected with the head of said chamber A directly below the inlet-pipe T', and the float F^3 provided with valve v^3 located in said cage c^3; substantially as specified.

2. In an automatic feeder for steam-boilers, a water-chamber A, a water-inlet pipe with a valve therefor, pipes t, T^2, connecting said chamber with the steam and water spaces of the boiler, a valve for each of said pipes, the valve in the water-pipe T^2 being provided with a leak-opening whereby the gradual leakage of water from the boiler into the chamber A will raise the pressure therein to the boiler-pressure, substantially as described.

3. In an automatic boiler-feeder for steam-boilers, the combination with the boiler of a chamber A having a water-inlet pipe T', water-pipe T^2 leading from the chamber to the boiler, steam-pipe t leading from the steam-space of the boiler to the chamber A and the steam-pipe x connecting the upper part of the chamber with the water-inlet pipe, a valve for each of these pipes the valve v^4 in pipe T^2 having a leak-opening o whereby the water is permitted to leak backward from the boiler into chamber A for the purpose set forth.

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

EDWIN J. STRONG.

Witnesses:
S. S. APPLEBY,
W. J. HOGAN.