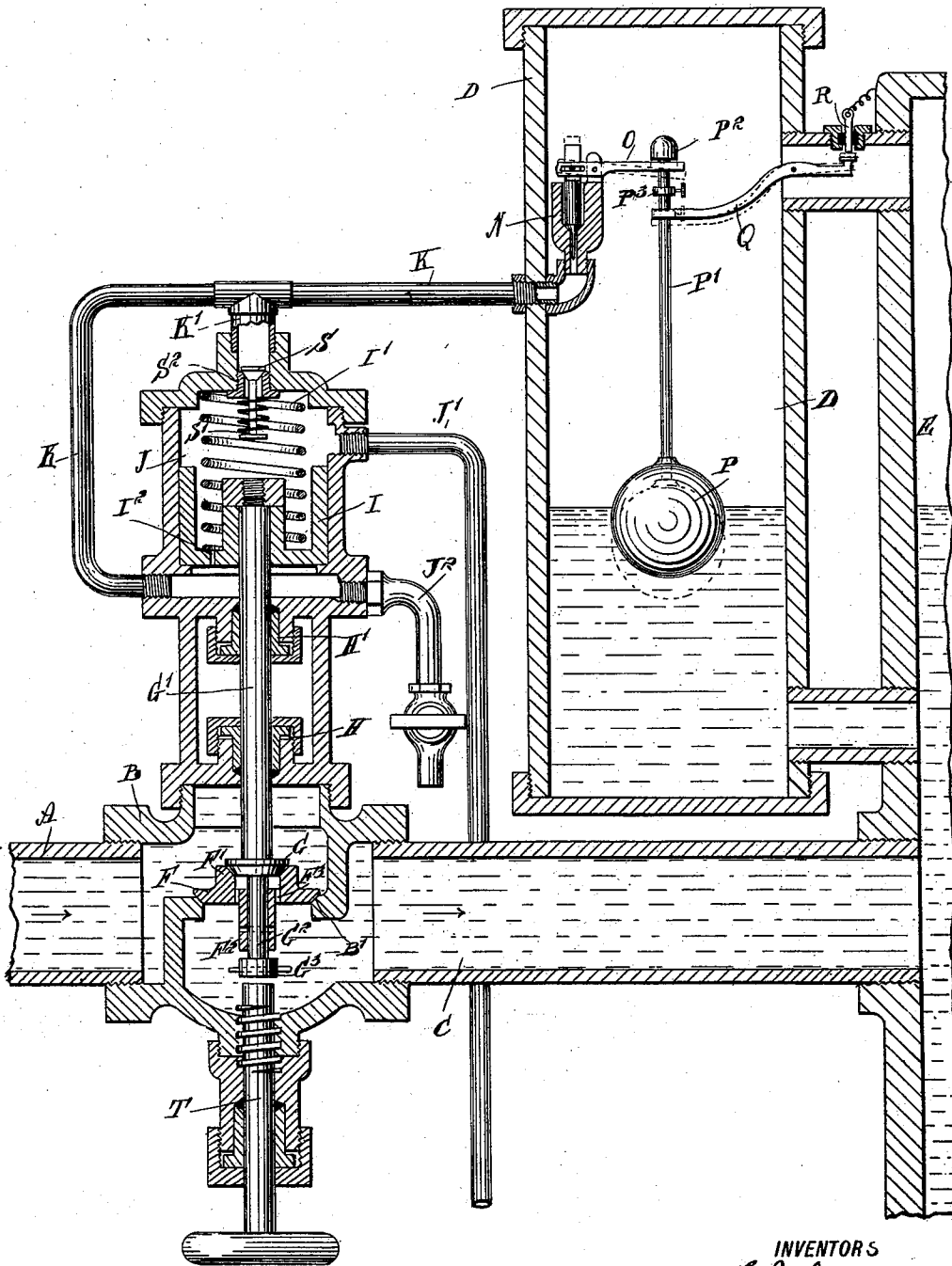


(No Model.)

G. JOHNSON & M. F. SMITH.
AUTOMATIC BOILER FEEDER.

No. 601,258.

Patented Mar. 29, 1898.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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ASSIGNORS TO THEMSELVES, AND HARRY C. DRUM, OF CALIFORNIA,
PENNSYLVANIA.

AUTOMATIC BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 601,258, dated March 29, 1898.

Application filed February 2, 1897. Serial No. 621,669. (No model.)

To all whom it may concern:

Be it known that we, GEORGE JOHNSON and MURPHY F. SMITH, of Allenport, in the county of Washington and State of Pennsylvania, have invented a new and Improved Automatic Boiler-Feeder, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved boiler-feeder which is simple and durable in construction and arranged for automatically keeping the boiler supplied with water at a normal level.

The invention consists principally of a float-controlled piston carrying a valve for admitting and shutting off the water to and from the boiler.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure represents a sectional side elevation of the improvement.

The improved boiler-feeder is provided with a water-supply pipe A, connected with a pump, water-main, or other suitable water-supply, the said pipe being also connected with a valve-casing B, connected by a pipe C with the water-compartment of the boiler E.

The valve-casing B is provided with the usual valve-seat B', on which is adapted to be seated a valve F', formed with the valve-seat F', adapted to be engaged by a small valve G, secured on a valve-stem G', fitted to slide vertically in suitable stuffing-boxes H and H', of which the stuffing-box H is secured to the casing B and the stuffing-box H' is attached to the under side of a cylinder J, containing a piston I, rigidly secured to the upper end of the said valve-stem G'.

From the valve-stem G' extends downwardly a reduced valve-stem G², carrying at its lower end a collar G³, adapted to engage a sleeve F², projecting downwardly from the large valve F, the said sleeve F² forming, with the valve F, openings or ports F³, leading to the valve-seat F'. When the valve G is seated on the seat F', then the collar G³ is a suitable distance below the sleeve F², so that the

valve G when moving upward off its seat F' leaves the valve F' still at its seat until the said collar G³ finally engages the sleeve F² and starts the valve F' off its seat B'. Now it is evident that when the valve G is lifted off its seat then water under pressure can pass through the valve-casing to press with equal force on both sides of the large valve F, so that the latter is easily unseated by the upward pressure of the collar G³ and the sleeve F². The piston I, previously mentioned, is normally held in a lowermost position by a spring I', arranged in the cylinder J. Into the bottom of the said cylinder, however, opens a steam-pipe K, connected with a valve N, arranged within the usual safety water-column D and connected by a lever O with the stem P' of the float P, rising and falling with the water contained in the safety water-column D. The lever O is engaged by a collar P², secured on the upper end of the stem P', and the latter is provided with an adjustable collar P³, adapted to engage the free end of the lever Q, arranged to make contact with an electric or whistle alarm R of any approved construction, so that the float P, on sinking with the falling of the water-level in the boiler E and safety water-column D, first causes an opening of the valve N, and, finally, a contact of the lever Q with the alarm R by the collar P³ striking the lever Q. Now when the water-level of the boiler E falls the valve N is first opened and steam can pass from the safety water-column D through the pipe K to the lower end of the cylinder J to lift the piston I and valve-stem G' to move the valve G off its seat F' on the large valve F. Water can now flow from the pipe A through the casing B to equalize the pressure on the valve F, so that the latter is unseated and a full flow of water takes place through the casing B into the safety water-column and boiler E. When the water rises in the boiler and safety water-column D, then the float P moves upward, and consequently the valve N is again closed to cut off the steam through the cylinder J, and as the piston I is provided with a leak-aperture I² steam can pass into the upper end of the cylinder J and from the latter through an outlet-pipe J' to the outside.

When the piston I moves upward in the cylinder J, it compresses the spring I' and finally engages the stem S' of the spring-pressed valve S, seated on the valve-seat S², secured to the cap of the cylinder J, the said cap being connected by a branch pipe K' with the pipe K. Thus when the piston I moves into an extreme uppermost position the valve S is unseated to admit steam to the cylinder J to return the piston I, as the steam-pressure is now equal on both sides of the piston I.

From the lower end of the cylinder J leads a drain-pipe J² for carrying off water of condensation accumulating in the said cylinder. In the bottom of the valve-casing B screws a valve-stem T, adapted to engage the under side of the collar G³ to enable the operator to unseat the valve G whenever it is desired to pass water directly into the boiler from the supply-pipe A for cleaning and other purposes. In case the pump does not act, or the water-supply to the casing B is interrupted for some reason or other, then the water in the boiler falling still farther finally causes the float P to engage with its collar P³, and the lever Q, to set the alarm in operation, so as to notify the engineer of the impending danger. Now it will be seen that by the arrangement described the device is completely automatic in operation and requires no attention whatever on the part of the engineer.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a boiler-feeder, the combination with a cylinder connected with the steam-compartment of the boiler, a valve for controlling the admission of steam to the cylinder, a piston in the cylinder, and a valve in the water-supply and operated by the piston, of a second and smaller valve in the water-supply for admitting water to equalize the pressure on the first-named valve, said second valve being also operated by the piston, substantially as described.

2. In a boiler-feeder, the combination with a cylinder connected with the steam-compartment of the boiler, a valve for controlling the admission of steam to the cylinder and a piston in the cylinder, of a valve in the water-supply and having a valve-seat on its upper surface, and a second and smaller valve on the said valve-seat, said second valve being connected with the piston and loosely connected with the first-named valve, substantially as described.

3. In a boiler-feeder, the combination with a cylinder connected with the steam-compartment of the boiler, a valve for controlling the admission of steam to the cylinder and a piston in said cylinder, of a valve in the water-supply and having a valve-seat on its upper

surface, a second and smaller valve on the said valve-seat, a valve-stem projecting from the smaller valve and connected with the piston, and a second valve-stem from the lower face of the smaller valve through the larger valve and provided with a collar at its end, substantially as described.

4. In a boiler-feeder, the combination with a cylinder, and a float-controlled valve for regulating the admission of steam to said cylinder, of a piston in the cylinder, a valve in the water-supply and having a valve-seat on its upper surface, a second and smaller valve on said seat, and a valve-stem on which the smaller valve is mounted, one end of the said stem being connected with the piston and the other end loosely connected with the larger valve, substantially as described.

5. In a boiler-feeder, the combination of a cylinder connected with the steam-compartment of the boiler, a valve for controlling the admission of steam to the cylinder, a float connected with said valve to open and close the same by the rise and fall of the water, a spring-pressed piston in the cylinder, a valve in the water-supply and having a valve-seat on its upper face, and a second and smaller valve on the said seat, said second valve being connected with the piston and loosely connected with the first-named valve, substantially as described.

6. In a boiler-feeder, the combination with a valve in the water-supply, of a cylinder having its lower end connected with the steam-compartment of the boiler, a float-controlled valve for regulating the admission of steam to the cylinder, a spring-pressed piston in the cylinder and connected with the stem of the valve in the water-supply, and a valved connection between the upper end of the cylinder and the pipe connecting the said cylinder with the steam-compartment of the boiler, substantially as described.

7. A boiler-feeder, comprising a supply-valve connected with a water-supply and with the boiler, a spring-pressed piston attached to the stem of the said valve, a cylinder containing the said piston, a valve in the steam-compartment of the boiler, a pipe connecting the said steam-valve with the said cylinder, a float rising and falling with the water in the boiler and connected with the said steam-valve to open and close the same, a branch connection between the said pipe and the cylinder, and a valve in the branch connection and arranged to be opened by the said piston, substantially as shown and described.

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Witnesses:

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