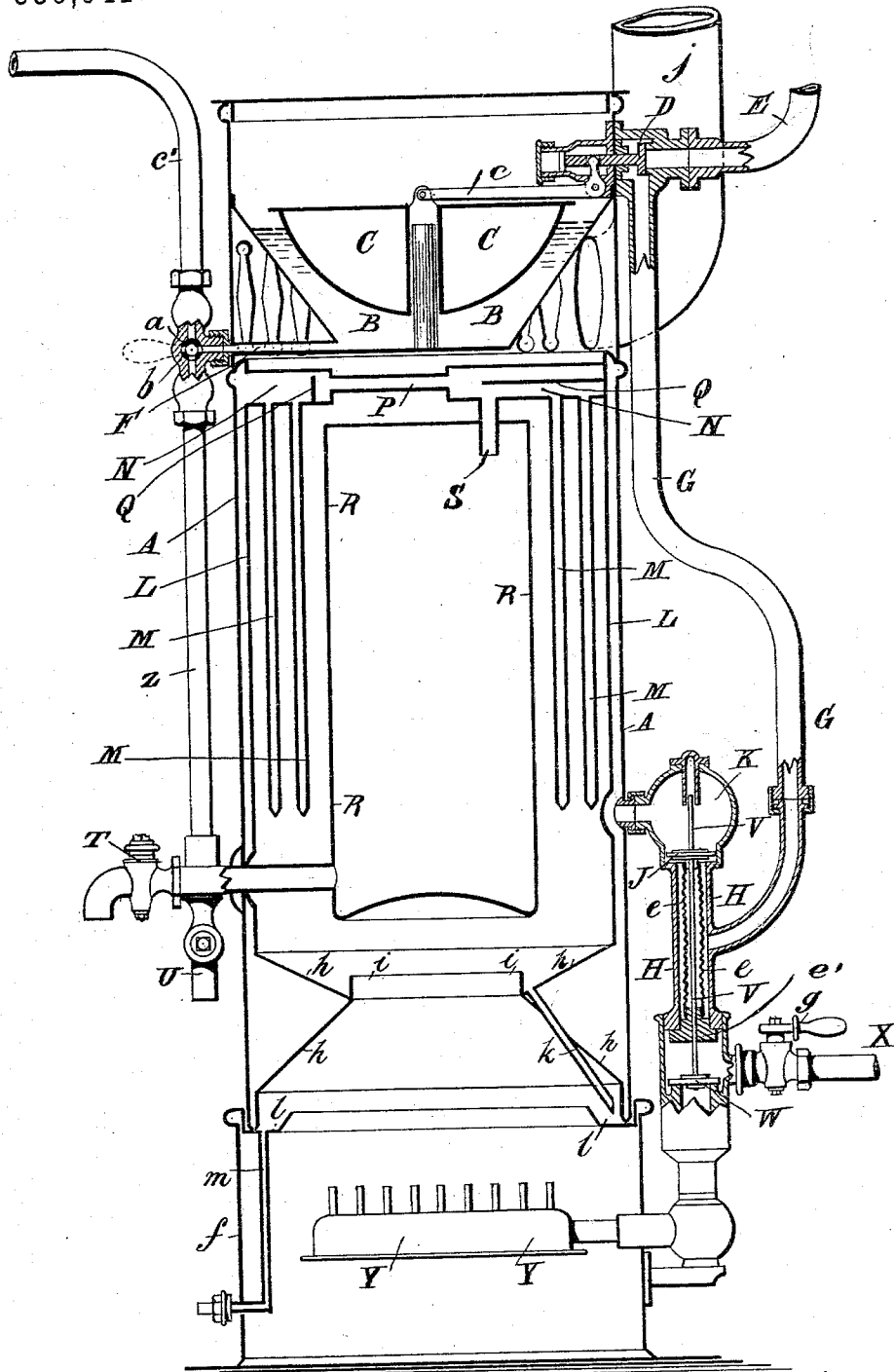


(No Model.)

E. A. PORCHER & J. WINTERFLOOD.
AUTOMATIC WATER HEATING APPARATUS.

No. 556,641.

Patented Mar. 17, 1896.



Witnesses.

Francis H. Hume

Robert G. Smith

Inventors.

Emile A. Porcher,

Joseph Winterflood.

By James L. Norris,

Att'y.

UNITED STATES PATENT OFFICE.

EMILE ALEXANDRE PORCHER, OF PARIS, FRANCE, AND JOSEPH WINTERFLOOD, OF LONDON, ENGLAND.

AUTOMATIC WATER-HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 556,641, dated March 17, 1896.

Application filed July 27, 1895. Serial No. 557,376. (No model.) Patented in England March 19, 1895, No. 5,746.

To all whom it may concern:

Be it known that we, EMILE ALEXANDRE PORCHER, a citizen of the Republic of France, residing at 52 Rue d'Hauteville, Paris, France, and JOSEPH WINTERFLOOD, a subject of the Queen of Great Britain, residing at 39 Thornhill Road, Barnsbury, London, England, have invented certain new and useful Improvements in Automatic Water-Heating Apparatus, (patented in Great Britain, No. 5,746, dated March 19, 1895,) of which the following is a specification.

This invention relates to an automatic water-heating apparatus, and has for its object to provide improved means for obtaining a constant supply of heated water; and to this end our invention consists in the features and in the construction or arrangement of parts hereinafter described and pointed out in the claims following the description, reference being had to the accompanying drawing, forming a part of this specification, which illustrates a vertical central section of our improved device.

Referring to said drawing, the letter A indicates an outer casing, and B a cistern arranged in the upper portion thereof.

C is a float arranged in the cistern B and connected to one end of a pivoted bell-crank lever *c*, which is connected at its other end to the stem of a reciprocating valve D that controls the outlet of a service-pipe E. Leading from the outlet end of the service-pipe E is a pipe G, that communicates at its lower end with a cylinder H, in which latter is arranged a piston J, the stem V of which carries at its lower end a valve W, that controls the passage in a gas-supply pipe X for supplying gas to a burner Y arranged beneath the casing A. The gas-supply pipe X is also provided with a stop-cock *g* adapted to be operated by hand. A spring is employed to normally hold the valve W to its seat. A flexible tube *e* surrounds the piston-stem V and is attached at its upper end to the collar of the piston J and at its lower end to a plug *e'* inserted in the lower end of the cylinder H, the said tube operating to prevent the escape of gas into the cylinder H.

Arranged upon the upper end of the cylinder H is a bulb K, that communicates with

the space between the outer casing A and an inner casing L, said space communicating by an overflow with circular depending vessels M M and two boxes N N, which are connected by a cross-pipe P. Each of the boxes N is provided with a baffle-plate Q to check a sudden inrush of water into the boxes, as will more fully hereinafter appear. An inner vessel R communicates with one of the boxes N by a pipe S and is provided at its lower end with a draw-off cock T. The water enters from the service-pipe E through the pipe G, raises the piston J and thence passes into the space between the outer casing, A, and inner casing, L, into the vessels M, boxes N and inner vessel, R. A branch pipe Z leads from the draw-off pipe of the vessel R to a valve-casing *b*, which in turn communicates by means of a pipe F with the cistern B. A pipe *c'* also communicates with the valve-casing *b* and leads off to a point remote from or at a higher level than the heater.

In the valve-casing *b* is arranged a three-way valve *a*, which is adapted to put the pipes Z and F in communication or to cut off the pipe F and place the pipe *c'* in communication with the pipe Z.

The lower part of the casing L terminates in a cone-shaped barrel *h* having a contracted neck *i* for concentrating the heat from the burner Y under the bottom of the vessel R. The heated products thence spread outwardly and in ascending heat the vessels M M, as well as the vertical sides of the vessel R and the vertical walls of the casing L, and thence, after striking the bottoms of the boxes N N and the connecting-pipe P, the fumes pass out by the flue *j* into the atmosphere.

The letter *k* indicates a pipe for leading the condensation of the vessels M M and central vessel R into the trough *l*, from which it is conducted off by the pipe *m*.

The operation of our improved apparatus is as follows: Let it be assumed that all the vessels and their connections are filled with water to the normal level. The float C will then be in its elevated position and will hold the valve D closed against its seat, cutting off the pressure from the service-pipe E. Under these conditions the valve W will be held to its seat, cutting off the supply of gas

from the burner Y. If now water be drawn from the vessel R, water will flow from the cistern B through the pipes F and Z to take the place of the water withdrawn, upon which the float C will fall and open the valve D and permit a fresh supply of water to flow from the service-pipe E. The water flows down the pipe G into the cylinder H, lifts the piston J and flows into the inner vessels and their connections. The piston J will remain in its lifted position until the water regains its normal level, when the float C will again raise and close the valve D, cutting off the pressure from the service-pipe E, upon which the piston will be forced down, closing the valve W. When the piston is raised by the inflowing water, the valve W is raised, permitting a flow of gas to the burner Y to heat the water that is cooled by the inflowing supply, and when the supply ceases said valve W automatically closes and shuts off the supply of gas.

In practice a small auxiliary burner is kept constantly burning to ignite the burner Y; but as such an arrangement forms no part of our invention and is well known in the art, we have not deemed it necessary to show or particularly describe the same.

For the purpose of permitting water to be drawn from the heater at a point below or remote from the same we provide a pipe U that leads from the discharge-pipe of the vessel R to the desired point.

By turning the cock *a* in the proper direction water may be conducted to a higher level through the pipe *c*.

Constructed as above described the apparatus is relieved from all strain of the pressure of a head of water, as the inlet-water can only flow in when the float lowers to open the valve D, as when the water is being drawn off from the vessel R.

Having described our invention, what we claim is—

1. In a water-heating apparatus the combination with a reservoir and a gas-burner arranged beneath the same, of a service-pipe, a valve for controlling the same, a cistern connected with the reservoir, a float-valve arranged in said cistern and operating said valve, a cylinder communicating with the reservoir, a pipe leading from the service-pipe to said cylinder, a gas-supply pipe leading to the burner, and a piston arranged in said cylinder and operating a valve controlling the gas-supply pipe, whereby when water is withdrawn from the reservoir the float in

the cistern opens the service-pipe and the pressure of the inflowing water opens the gas-valve and furnishes gas to the burner, substantially as described.

2. In a water-heating apparatus, the combination with a reservoir and a gas-burner arranged beneath the same, of a service-pipe, a valve for controlling the same, a discharge-pipe for said reservoir having a stop-cock, a cistern, a pipe leading from said cistern to the discharge-pipe, a float-valve arranged in the cistern and operating the said valve, a cylinder communicating with the reservoir, a pipe leading from the service-pipe to said cylinder, a gas-supply pipe leading to the burner, and a piston arranged in said cylinder and operating a valve controlling the gas-supply pipe, whereby when water is withdrawn from said stop-cock the float in the cistern opens the service-pipe and the pressure of the inflowing water opens the gas-valve and furnishes gas to the burner, substantially as described.

3. In a water-heating apparatus, the combination with a reservoir and a gas-burner arranged beneath the same, of a service-pipe, a valve for controlling the same, a discharge-pipe for said reservoir having a stop-cock, a cistern, a pipe leading from said discharge-pipe to a point above the level of the heater, a branch pipe connecting said last-named pipe with the cistern, a three-way cock arranged at the junction of said branch pipe and the pipe leading from the discharge-pipe, a pipe leading from the discharge-pipe to a point below the heater, a float-valve arranged in the cistern and operating the service-pipe valve, a cylinder communicating with the reservoir, a pipe leading from the service-pipe to said cylinder, a gas-supply pipe leading to the burner, and a piston arranged in the cylinder and operating a valve controlling the gas-supply pipe, substantially as described.

In witness whereof we have hereto signed our names in the presence of two subscribing witnesses.

EMILE ALEXANDRE PORCHER.
JOSEPH WINTERFLOOD.

Witnesses to the signature of Emile Alexandre Porcher:

CLYDE SHROPSHIRE,
A. J. HERON.

Witnesses to the signature of Joseph Winterflood:

ARTHUR SAINSBURY,
GEORGE ELVART.