

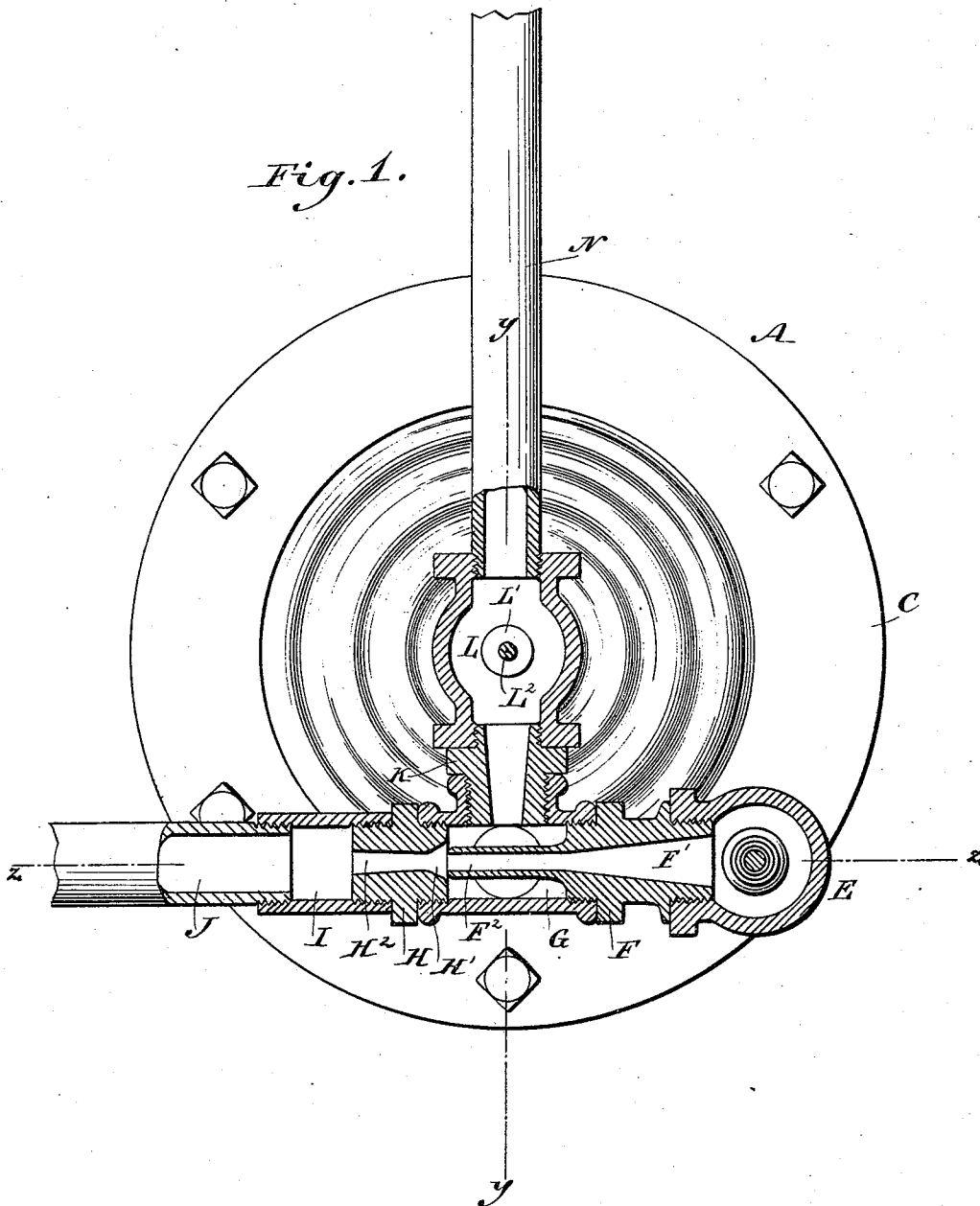
(No Model.)

2 Sheets—Sheet 1.

A. P. MONNIER.
WATER HEATER.

No. 436,254.

Patented Sept. 9, 1890.



WITNESSES:

John Deemer
C. Hodgwick

INVENTOR:

A. P. Monnier
BY *Munn & Co.*
ATTORNEYS

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

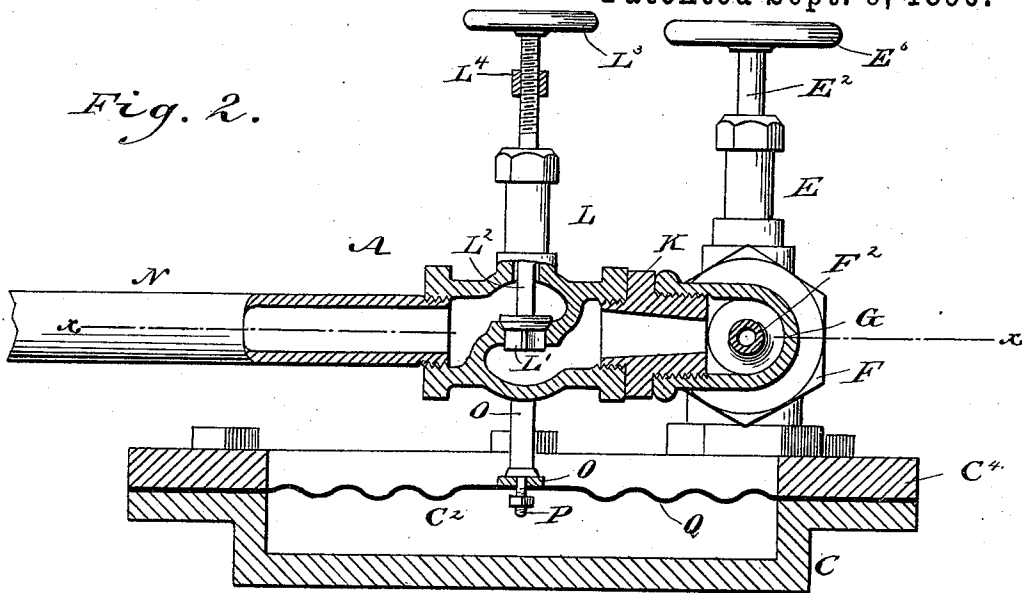
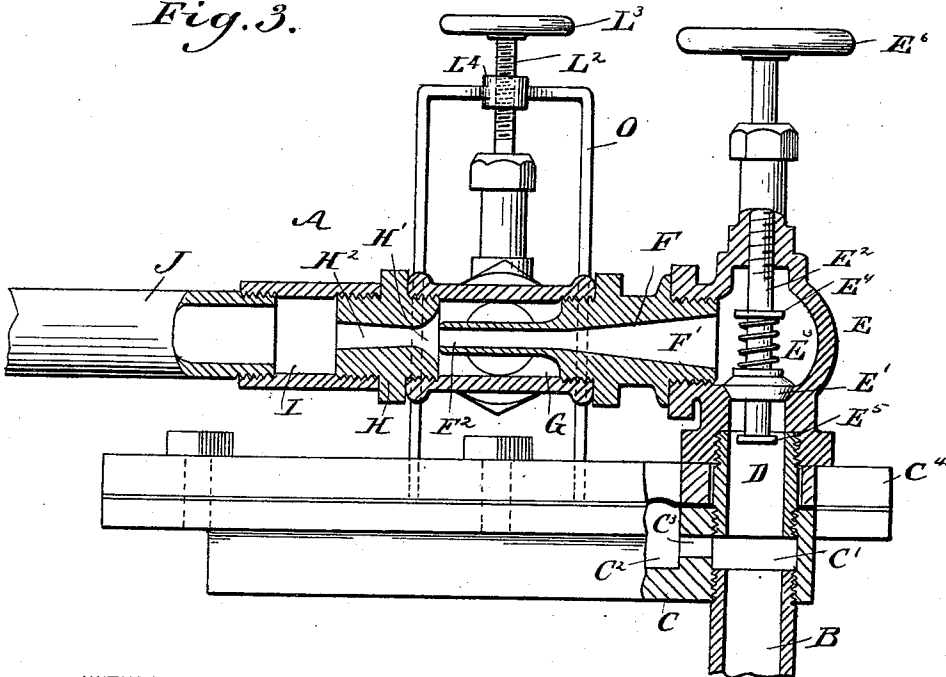


Fig. 3.



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UNITED STATES PATENT OFFICE.

ALFRED P. MONNIER, OF GREENFIELD, MICHIGAN.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 436,254, dated September 9, 1890.

Application filed January 27, 1890. Serial No. 338,217. (No model.)

To all whom it may concern:

Be it known that I, ALFRED P. MONNIER, of Greenfield, in the county of Wayne and State of Michigan, have invented a new and Improved Water-Heater, of which the following is a full, clear, and exact description.

The object of this invention is to provide a new and improved water-heater, specially designed for use in steam-heated greenhouses, and serving to heat water to a temperature of about 70° to 80° Fahrenheit for watering and sprinkling flowers during the winter-time, and for other purposes.

My invention is also adapted to heat the feed-water for steam-boilers.

The invention consists of a water-inlet pipe provided with a spring-pressed regulating-valve, a diaphragm controlled by the water in the said pipe, a water-delivery nozzle connected with the said water-inlet pipe, and a steam-pipe leading to the said nozzle and provided with a valve controlled by the said diaphragm.

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

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional plan view of the improvement on the line *x x* of Fig. 2. Fig. 2 is a transverse section of the same on the line *y y* of Fig. 1, and Fig. 3 is a sectional side elevation of the same on the line *z z* of Fig. 1.

The improved water-heater A is provided with a water-inlet pipe B, connected with a pump and hydrant for forcing cold water through the said pipe. The pipe B is connected with a small chamber C', formed in the diaphragm-cylinder C, and connected by a short pipe D with a valve E, provided with the valve proper E', adapted to be seated in the valve-body by the action of a spring E³, coiled on the valve-stem E², screwing in the valve-body and on which the valve proper E' is loosely held. The spring E³ rests with one end against the top of the valve proper E', so as to force the latter on its seat, and the other end of the said spring presses against the

collar E⁴, secured on the valve-stem E². On the lower end of the latter is arranged a collar E⁵ to prevent the valve proper E' from becoming detached from the valve-stem E² when the latter is moved into an uppermost position.

On the outer end of the valve-stem E² is secured the usual hand-wheel E⁶ for turning the valve-stem, so as to raise or lower it and to regulate the tension of spring. It will be seen that when the valve-stem is raised the pressure of the spring E³ on the valve proper E' decreases, so that it takes less force of water passing through the pipes B and D to raise the valve from its seat. When the valve-stem E² is screwed down, the valve proper E' is held on its seat with great force by the spring E³, so that it takes a greater amount of pressure on the water to raise the valve from its seat. The valve E is connected above the valve proper E' with the conical opening F' in the water-delivery nozzle F, which opening terminates at its small end in a cylindrical opening F², formed on the outer end of the said nozzle. This end of the nozzle F passes through the short pipe G and opens into the bell-shaped mouth H' of a pipe H, screwing on the pipe G, and carrying a nipple I, from which leads the discharge-pipe J, through which the heated water passes to a sprinkling-hose can or other receptacle. The bell-shaped mouth H' terminates in the small end of a cone-shaped opening H², leading to the nipple I, as is plainly shown in Figs. 1 and 3. Into the pipe G opens the small end of the cone-shaped opening of a pipe K, on which is held a valve L, connected with the steam-inlet pipe N, leading to the steam-dome of the boiler, so that the steam from the latter can pass through the said pipe N through the valve L into and through the pipes K and G to mix with the water in the latter to heat the same and condense, so that the water by the pressure of the steam is forced into the outlet-pipe J, to be used as above described.

The valve L is provided with a valve proper L', secured on a valve-stem L², carrying on its outer end the usual hand-wheel L³ for raising and lowering the said valve proper L'. The valve-stem L² is threaded near its outer end,

and on it screws a nut L^4 , held on a frame O extending downward, and secured by a bolt P in the middle of the diaphragm Q , held in the diaphragm-cylinder C , forming below it a chamber C^2 , connected by a port C^3 with the chamber C^1 , previously mentioned, so that water entering the pipe B can pass through the said port C^3 into the chamber C^2 and there exert a pressure on the under side of the diaphragm Q , whereby the latter is forced outward, moving the frame O in the same direction, so that the valve L^1 is unseated and steam is admitted to the pipes K and G , as previously described. The amount of steam admitted regularly to the pipes K and G can be regulated by turning the hand-wheel L^3 , so that the stem L^2 screws up or down in the nut L^4 , held on the frame O , rigidly connected with the diaphragm Q .

The operation is as follows: The valve proper E^1 remains seated by the force of the spring E^3 until the operator starts the pump or admits water under pressure through the pipe B , so as to overcome the tension of the said spring. The water under pressure also flows into the chamber C^2 and acts on the diaphragm Q , as previously mentioned, so that the frame O moves upward and lifts the valve-stem L^2 , so as to raise the valve L^1 from its seat to admit steam to the pipes K and G , as the water has previously passed by the valve E^1 into the nozzle F , which is heated by the steam in the pipe G , and when it leaves the end F^2 of the nozzle F it is forced into the bell-shaped mouth H^1 of the pipe H by the force of the steam, which latter, however, condenses more or less, according to the temperature of the cold water. The latter, after being heated, flows from the pipe H , into which it is forced by the action of the steam through the nipple I , to the outlet-pipe J , from which the heated water passes into a sprinkling-hose can or other suitable receptacle. The water is thus heated to a temperature of about 70° to 80° Fahrenheit and can be used for sprinkling flowers and plants in the winter-time to facilitate the growth of the same. It will be seen that the pressure on the diaphragm Q by the incoming water regulates the admission of steam to the incoming water and the flow of the latter to the steam-compartment—that is, the pipe G is regulated by the spring-pressed valve E^1 , the tension of which can be regulated as previously described.

Having thus fully described my invention,

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

1. In a water-heater, the combination, with a water-inlet pipe provided with a spring-pressed regulating-valve, of a diaphragm controlled by the water in the said pipe, a water-delivery nozzle connected with the said water-inlet pipe, and a steam-pipe leading to the said water-delivery nozzle and provided with a valve controlled by the said diaphragm, substantially as shown and described.

2. In a water-heater, the combination, with a water-inlet pipe provided with a spring-pressed regulating-valve, of a diaphragm controlled by the water in the said pipe, a water-delivery nozzle connected with the said water-inlet pipe, a steam-pipe leading to the said water-delivery nozzle and provided with a valve controlled by the said diaphragm, and a discharge-pipe having a bell-shaped opening into which open the said nozzle and the said steam-pipe, substantially as shown and described.

3. In a water-heater, the combination, with a water-inlet pipe, of a diaphragm connected with the said water-inlet pipe, a frame connected with the said diaphragm, a valve connected with the said frame, a steam-pipe containing the said valve, a regulating-valve connected with the said water-inlet pipe, a water-delivery nozzle connected with the said valve, and a pipe forming a steam-chamber around the discharge end of the said nozzle and in which pipe discharges the said steam-pipe, substantially as shown and described.

4. In a water-heater, the combination, with a water-inlet pipe, of a diaphragm connected with the said water-inlet pipe, a frame connected with the said diaphragm, a valve connected with the said frame, a steam-pipe containing the said valve, a regulating-valve connected with the said water-inlet pipe, a water-delivery nozzle connected with the said valve, a pipe forming a steam-chamber around the discharge end of the said nozzle and in which pipe discharges the said steam-pipe, and a water-delivery pipe connected with the said steam-chamber and provided with a bell-shaped mouth into which opens the discharge end of the said nozzle, substantially as shown and described.

ALFRED P. MONNIER.

Witnesses:

CHARLES P. COLLINS,
GEO. C. LAWRENCE.