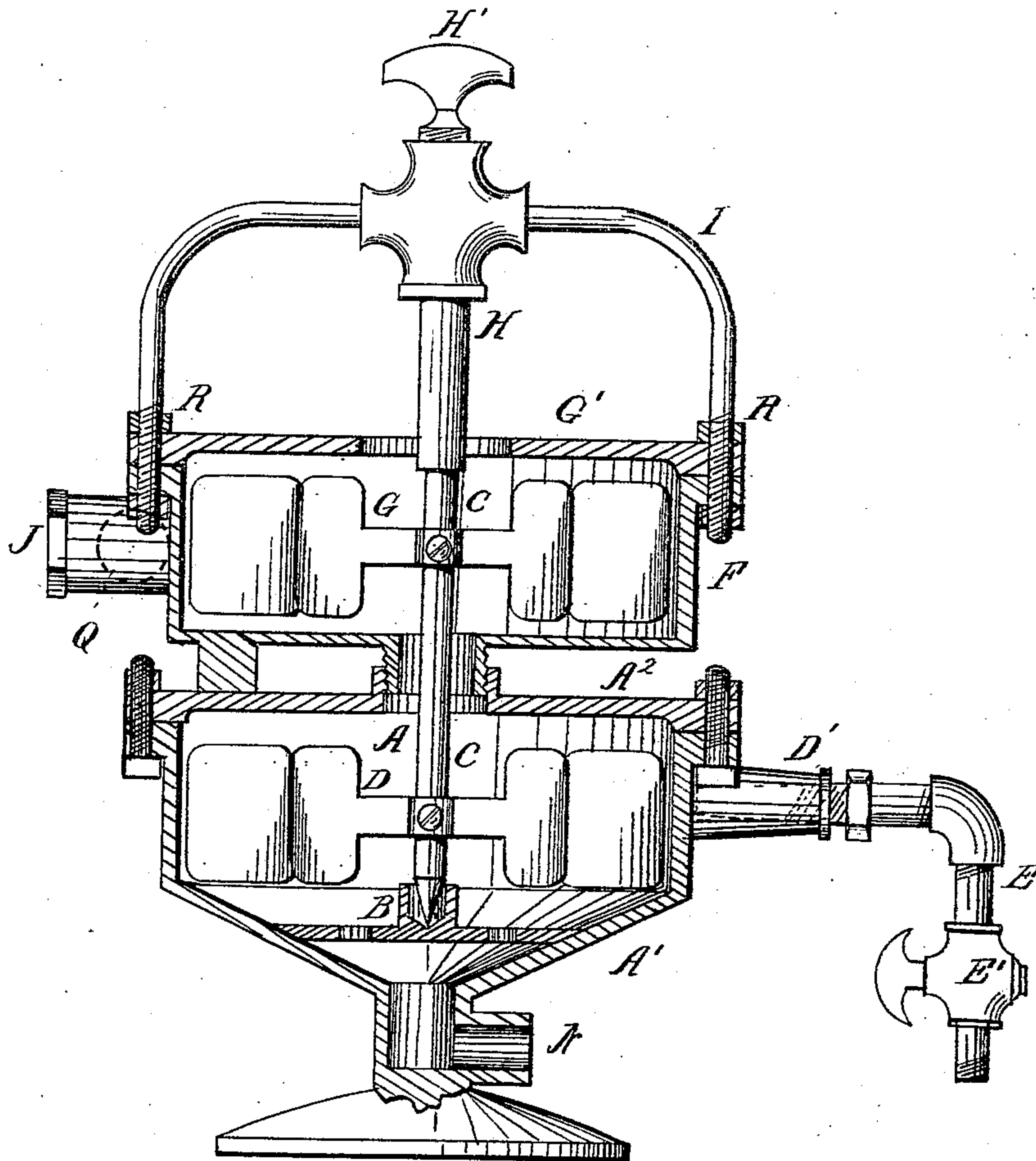


**T. H. HARRINGTON.**  
**Combined Air Heater and Boiler.**

No. 169,167.

Patented Oct. 26, 1875.

*Fig. 1.*



WITNESSES

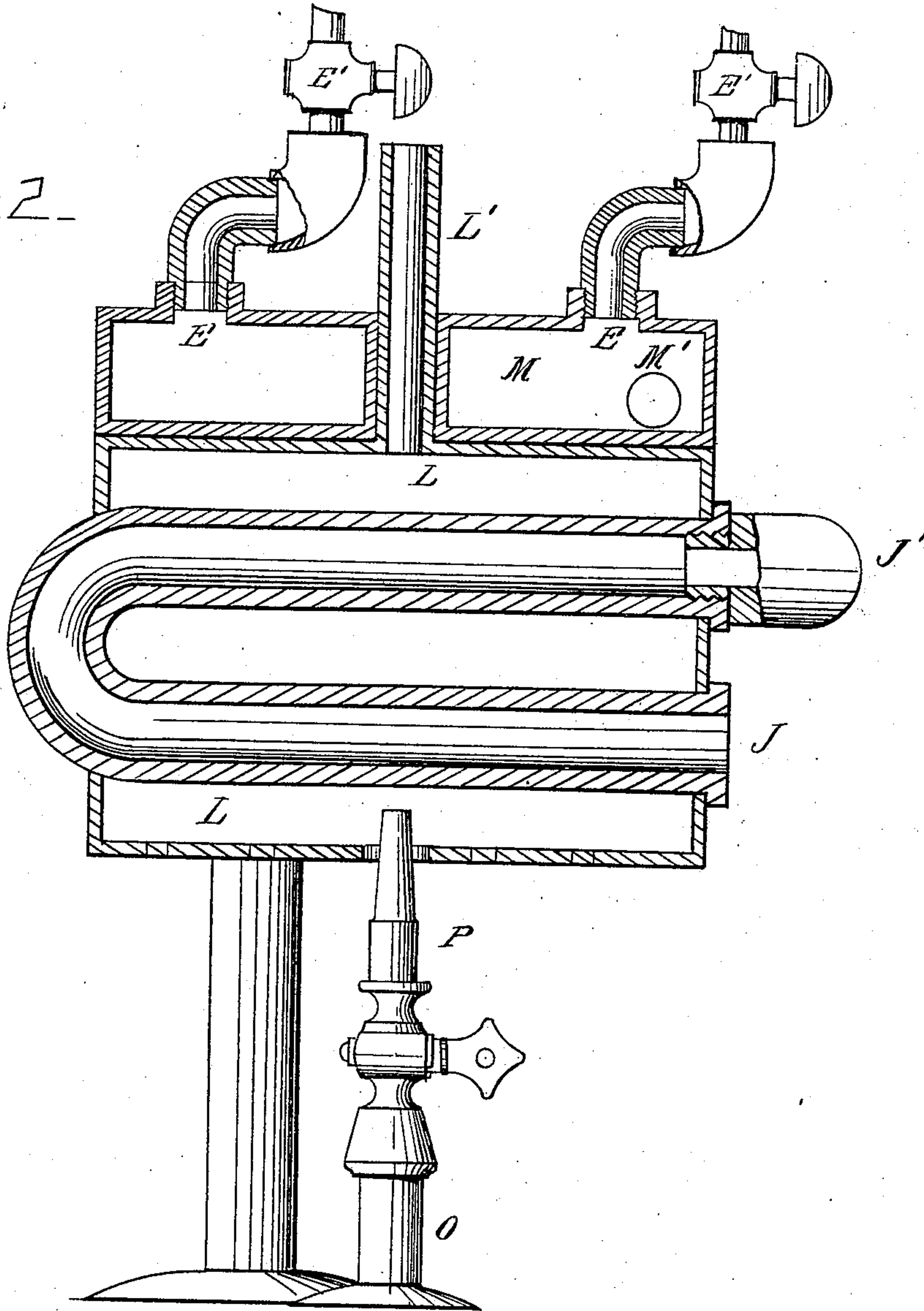
*E. J. Nottingham.*  
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INVENTOR

*Thomas H. Harrington.*  
By *Leggett & Leggett* Attorneys.

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*Fig 2.*



WITNESSES  
C. J. Nottingham  
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INVENTOR



# UNITED STATES PATENT OFFICE.

THOMAS H. HARRINGTON, OF PITTSBURG, PENNSYLVANIA.

## IMPROVEMENT IN COMBINED AIR-HEATERS AND BOILERS.

Specification forming part of Letters Patent No. **169,167**, dated October 26, 1875; application filed September 6, 1875.

*To all whom it may concern:*

Be it known that I, THOMAS H. HARRINGTON, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Combined Heater and Boiler; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to a combined heater and boiler; and it consists in an apparatus run by water, which apparatus operates a fan, which latter keeps up a circulation through a coil of pipe located in a chamber above a gas-burner or burners, the said pipe being surmounted by a water-boiler, and the water that operates the wheel passes through and is heated in the boiler, being therefore never liable to freeze.

In the drawing, Figure 1 is a vertical section through the water-wheel and fan. Fig. 2 is a vertical longitudinal section through the boiler and heater. A is a cylindrical case, with a conical bottom, A'. Near the bottom of this case is a shoe, B, which supports the base of the upright shaft C. D is a water-wheel located on that shaft in the cylindrical portion of the case A. It is driven by water, which enters through a diminished nozzle, D', which nozzle is attached preferably to the service-pipe E. A<sup>2</sup> is a cover, which fits upon the case A, which makes it comparatively tight, though not necessarily water-tight, as the water is not intended to fill up the chamber A. Superposed upon the chamber A is a chamber, F. The shaft C passes up through this chamber F, and is here provided with a fan, G. This chamber is covered by the cover G', which is open about its center that air may be sucked in by the fan G. H is a dead-center, fixed so as to form a support or bearing for the top of the shaft C. This center is supported by a bow, I, and is made adjustable upon this bow by means of a suitable set-screw, H', whereby it may be adjusted centrally, or so as to cause the wheels D and G to revolve free through the cases A and F. J is a pipe or outlet leading from the chamber

F, through which air is forced. This pipe J is formed with a coil, and is subjected to heat from gas-burners P in the chamber or drum L, after which the air thus warmed is discharged into the apartment through the opening J' or the pipe leading therefrom. Superposed upon the heating-chamber L is a water-boiler, M, provided with a faucet, M', for drawing off water for domestic purposes. The service-pipe E passes into this boiler from one side, and starts out again from the other side, as shown, so that the boiler forms a part of this pipe, and therefore has within it a pressure that is due to the head of fluid. It should therefore be sufficiently strong to resist this pressure. A pipe, L', from the chamber L, passes up through the boiler M and out of its top, through which the products of combustion, or the noxious odors arising from the burning gas, may be conveyed away. This pipe L' assists in warming the water in the boiler M. Faucets E' serve to cut off communication on either side of the boiler M.

The operation of the device is as follows: This apparatus is placed in any suitable locality—as, for instance, the cellar of a house—a waste-pipe is connected at N to convey away the water after it has driven the wheel. Being in position, the gas, passing through the pipe O and burner or burners P, is directed against the pipe-coil J in the chamber L. The heat, rising, warms the water in the boiler M above. Water is turned on by means of the faucet E', and, passing through the pipes E, is delivered through the nozzle against the periphery of the wheel D. This wheel, in turn, drives the shaft C, and with it the fan G. This fan draws air in through the central opening above, and forces it through the pipe J, where it is heated in the chamber L, and discharged from J' through any suitable pipe into any particular apartment. The circulation is obviously kept up by the wheel G, and the apartment is therefore readily heated. At the same time the heat is utilized to heat the water in the boiler above, and it may be used therefrom through the faucet M' for domestic purposes, and at the same time, warm water being used to propel the wheel, there is no danger from freezing.

In the pipe J, near the wheel G, I place a



ball, Q. This ball prevents a free passage of the air, and, consequently, causes it to back up to a certain extent in the chamber F, and, as a result, the fan G is made to run very quietly. The center H is adjustable up or down by means of the nuts R on the bow I, so that any wear caused by shaft C may be readily compensated.

It will be observed that with a very small waste of water, and with a slight amount of gas, an apartment may be readily warmed, while the gas is, at the same time, utilized for heating the water. Moreover, a perfect circulation, in fact, a blast, of hot air is constantly maintained by the fan, regardless of any natural draft.

It should be noticed that the water driven through the nozzle against the wheel D will, immediately after delivering its impact on the

bucket, drop down free from the buckets and pass out of the exit or waste below.

What I claim is—

1. The combination, with the fan G, pipe J, and heating-chamber L, of the water-boiler M, connected with the service-pipe, substantially as and for the purpose described.

2. The combined heater and boiler consisting of the pipes E, boiler M, wheel D, and shaft C, in combination with the fan G, the pipe J, heating-chamber L, and burners P, substantially as and for the purposes described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS H. HARRINGTON.

Witnesses:

H. T. HOWER,

T. B. HALL.