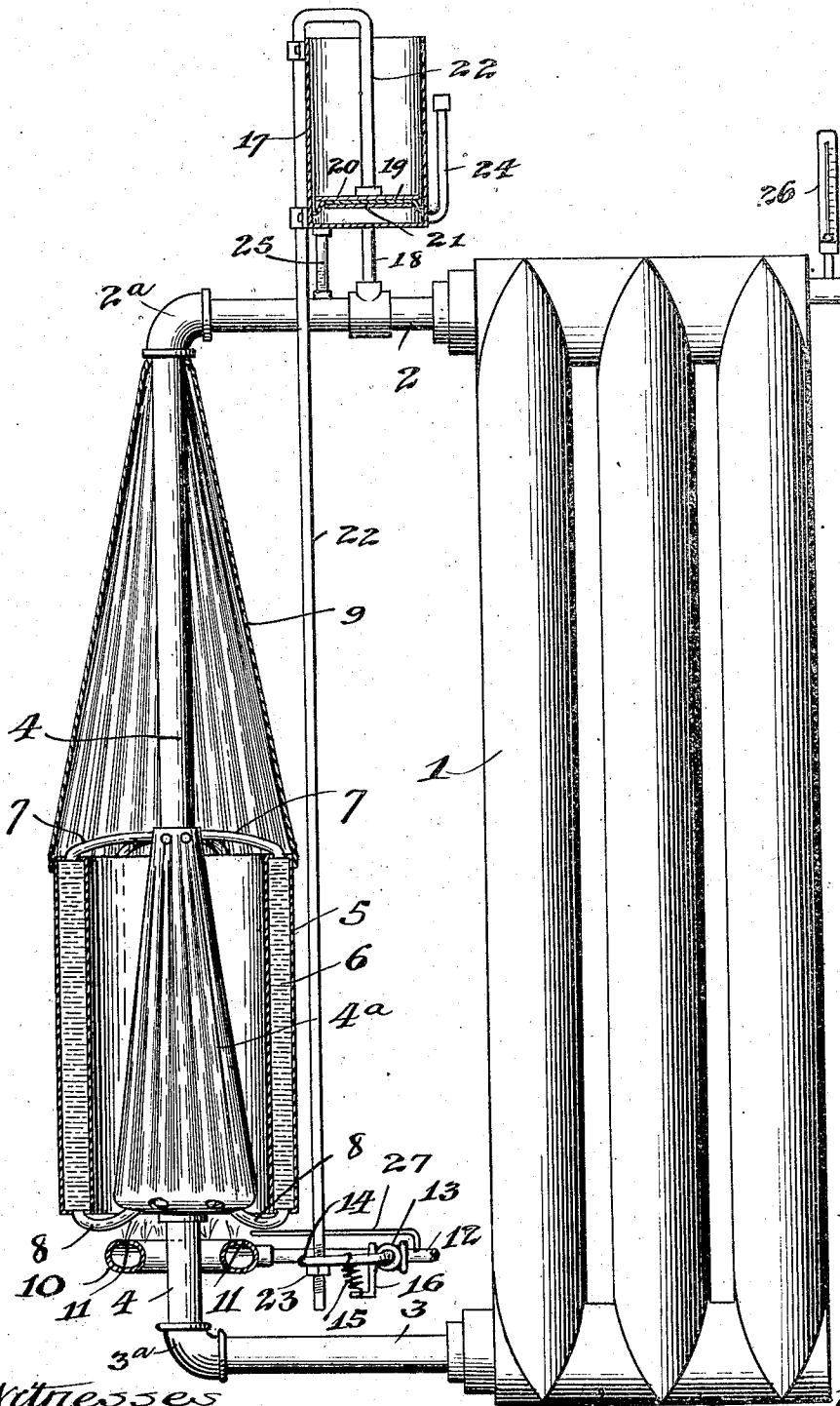


J. MRACEK.
HOT WATER HEATER.
APPLICATION FILED MAY 14, 1908.

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Patented May 11, 1909



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UNITED STATES PATENT OFFICE.

JOHN MRACEK, OF CHICAGO, ILLINOIS.

HOT-WATER HEATER.

No. 920,982.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN MRACEK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hot-Water Heaters, of which the following is a specification.

This invention relates to heating appliances for rooms, apartments, and the like, having reference more particularly to that type wherein the heating effect is secured by the circulation of hot water through suitable heat-radiating devices.

The main object of the invention is to provide an independent and self-contained heating apparatus employing a gaseous fuel, by which I mean an apparatus wherein each radiator is equipped with its own means for heating and regulating the temperature of the water circulating therein, independent of the conditions that may exist in other radiators employed in the same room or building.

My invention, in one approved mechanical form in which the same may be embodied, is illustrated in the accompanying drawing, wherein the figure is a side elevation of a portion of an ordinary hot water radiator with water-heating and gas-controlling attachment applied thereto, the latter appearing partly in vertical section.

Referring to the drawing, 1 designates an end portion of an ordinary hot water radiator, the upper and lower limbs of which are connected for the circulation of water by a pipe herein shown as comprising upper and lower horizontal sections 2 and 3, respectively, and an intermediate vertical section 4 connected to the horizontal section by upper and lower elbow couplings 2^a and 3^a, respectively. In the vertical section 4 of this pipe is interposed a somewhat enlarged section herein shown as a hollow tapered member 4^a, wide at its bottom and narrow at its top and freely communicating at both ends with the upper and lower sections of the pipe 4, as shown. Surrounding the enlarged section 4^a of the pipe 4 is a drum 5 containing an annular water chamber 6 formed by and between the inner and outer walls of the drum, this latter being connected and communicating freely with the upper and lower ends of the tapered section 4^a by a series of pipes 7 and 8, respectively. Surmounting the drum 5 and surrounding the upper section of the pipe 4 is a cone-shaped hood 9, which latter,

as also the tapered or cone-shaped section 4^a, is preferably and as herein shown, corrugated.

Directly below the lower or wide end of the tapered pipe section 4^a, and surrounding the lower section of the pipe 4, is an annular gas burner 10, provided with the usual series of jet apertures 11 in its upper side. Tapping this burner ring laterally is a gas-supply pipe 12 in which is interposed an ordinary valve-cock 13, the stem of which is bent at right angles and extended alongside the supply-pipe, as shown at 14. A coiled spring 15 connected at one end to the arm 14 of the valve and at its other end to a bracket 16 supported by the supply-pipe 12, or to any other convenient point of attachment, normally tends to open the valve 13.

Surmounted on the upper pipe section 2, or any other part of the radiator, is an expansion tank 17 herein shown as supported upon a central pipe 18 through which the interior of the tank communicates freely with the pipe section 2 and the water in the radiator. In this tank is secured a diaphragm 19, to which is connected by clamping plates 20 and 21 a valve-actuating rod 22, the lower end of which passes through an aperture in the valve arm 14, being adjustably connected to the latter by a nut 23 engaging the threaded lower end of the rod. A filling tube 24 for the radiator communicates with the expansion tank 17 below the diaphragm 19, and an indicator tube 25 and thermometer 26 serve, respectively, to indicate the height and temperature of the water in the radiator.

27 indicates a small pipe tapping the gas-supply pipe 12 on the supply side of the valve 13 and extending to a point adjacent to the upper edge of the burner, and constituting a pilot light.

In operation, the radiator, including the end pipe attachment to which the burner is applied, having been filled with water, the gas is ignited at the burner 10, which rapidly heats the water in the superposed pipe sections 4^a and 4, as likewise the water in the annular drum 5. This at once institutes and, so long as the water remains heated, maintains a circulation of water between the upper and lower parts of the radiator through the described pipe connections at the end of the latter. As the water becomes heated, it rises through the pipe 18 into the expansion tank 17, and as it exceeds in temperature the

predetermined desired point, it raises the diaphragm 19 and, through the latter and the valve-rod 22, lifts the valve-arm 14 against the action of spring 15 and partially or wholly cuts off the supply of gas to the burner, thus either reducing or extinguishing the heating flame. By adjusting the nut 23, the supply of gas to the burner may be reduced or cut off when a greater or less temperature has been reached in the water circulating through the radiator, since the expansion and contraction of the water are proportional to its rise and fall of temperature. In the normal operation of the device, the burner will be automatically maintained, through control of the gas supply therefor, at such a heat as suffices to maintain at a uniform point the desired temperature in the radiator. If, however, through variations in gas pressure or from any other cause, this temperature is exceeded, the supply thereof is at once further acted upon to further reduce or entirely cut off the gas to the burner. In the latter event, the rapid reduction in temperature of the water which follows soon permits the valve to be re-opened, whereupon the pilot light at once reestablishes the heating flame at the burner.

The drum 5 with its annular water chamber contributes materially to the efficiency of the burner in heating the water by adding a considerable surface area that is exposed on one side to the water in the system and on the other side to the heating effects of the products of combustion. By reason of the fact that the cooling water enters the cone-shaped section of the circulation pipe centrally of its lower wide end, and of the further fact that the latter is freely connected both at top and bottom to the upper and lower ends of the annular water chamber by the series of radially disposed pipes 7 and 8, a substantial equilibrium of the water in the conical and annular chambers is maintained at all times, the contracted or narrowed upper end of the conical chamber, in association with the free communication between the lower ends of the two chambers, also forcing the water into contact with a large area of heating surface, whereby local circulation within the water-heating device itself is avoided. The hood 9 also confines and directs the hot gases rising from the drum 5 to and upon the upper pipe section 4, thus securing additional heating effect upon the water in said pipe section and contributing to the economical and efficient utilization of the heat yielded by the burner.

I claim:

1. A heating appliance for rooms, apartments and the like, comprising a radiator adapted for water circulation and having a circulation pipe connecting the upper and lower portions thereof, the vertical portion of said circulation pipe having interposed

therein an enlarged conical section coaxially disposed with reference to said vertical portion of the circulation pipe with its wide end or base lowermost, a gas burner directly beneath the base of said conical section, a drum having an annular water chamber surrounding and substantially co-extensive longitudinally with said conical section, and with the latter forming an annular flue for the heated products of combustion from the burner, a plurality of radially disposed pipes forming a communication between the upper ends of said conical section and drum, and a plurality of similar pipes forming a communication between the lower ends of said conical section and drum, substantially as described.

2. A heating appliance for rooms, apartments and the like, comprising a radiator adapted for water circulation and having a circulation pipe connecting the upper and lower portions thereof, the vertical portion of said circulation pipe having interposed therein an enlarged conical section coaxially disposed with reference to said vertical portion of the circulation pipe with its wide end or base lowermost, a gas burner directly beneath the base of said conical section, a drum having an annular water chamber surrounding and substantially co-extensive longitudinally with said conical section, and with the latter forming an annular flue for the heated products of combustion from the burner, a plurality of radially disposed pipes forming a communication between the upper ends of said conical section and drum, a plurality of similar pipes forming a communication between the lower ends of said conical section and drum, and a hood surmounting said drum and surrounding the vertical portion of said circulation pipe above said conical section, substantially as described.

3. A heating appliance for rooms, apartments and the like, comprising a radiator adapted for water circulation and having a circulation pipe connecting the upper and lower portions thereof, the vertical portion of said circulation pipe having interposed therein an enlarged conical section coaxially disposed with reference to said vertical portion of the circulation pipe with its wide end or base lowermost, a gas burner directly beneath the base of said conical section, a drum having an annular water chamber surrounding and substantially co-extensive longitudinally with said conical section, and with the latter forming an annular flue for the heated products of combustion from the burner, a plurality of radially disposed pipes forming a communication between the upper ends of said conical section and drum, a plurality of similar pipes forming a communication between the lower ends of said conical section and drum, a hood surmounting said drum and surrounding the vertical portion of said

circulation pipe above said conical section,
a fuel supply-pipe for said burner, a valve
in said pipe, and means whereby the posi-
tion of said valve is automatically controlled
5 by the temperature of the water in said ra-
diator, substantially as described.

In testimony that I claim the foregoing

as my invention, I have hereunto subscribed
my name in the presence of two witnesses.

JOHN MRACEK.

Witnesses:

SAMUEL N. POND,

FREDERICK C. GOODWIN.