

No. 646,482.

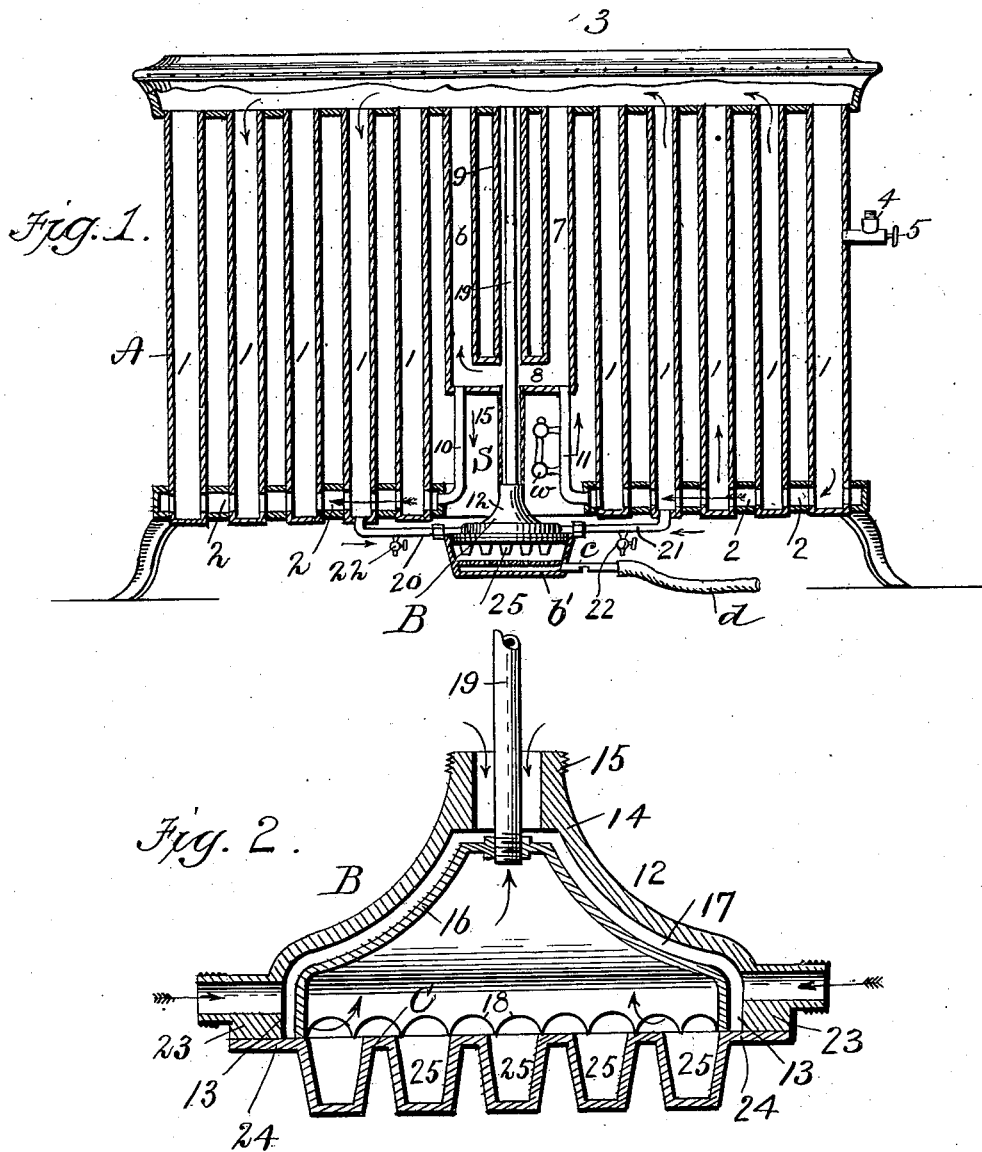
Patented Apr. 3, 1900.

F. V. WINTERS.  
RADIATOR AND HEATER THEREFOR.

(Application filed July 25, 1898. Renewed Aug. 31, 1899.)

(No Model.)

2 Sheets—Sheet 1



Witnesses  
F. L. Ouraud.  
Geo. H. Evans

Inventor  
Fred V. Winters,  
by R. G. Heyman,  
Attorney

No. 646,482.

Patented Apr. 3, 1900.

F. V. WINTERS.

RADIATOR AND HEATER THEREFOR.

(Application filed July 25, 1898. Renewed Aug. 31, 1899.)

(No Model.)

2 Sheets—Sheet 2

Fig. 3

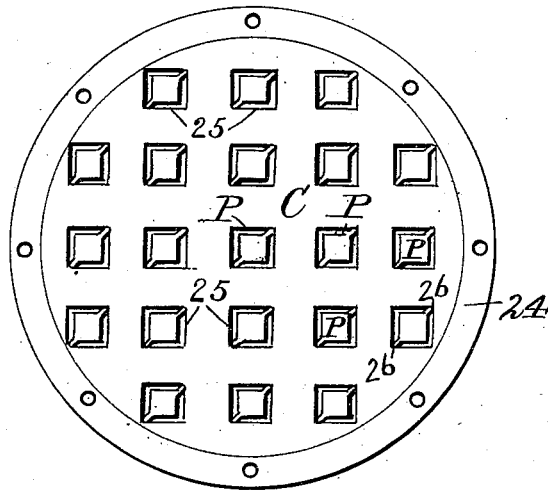


Fig. 4

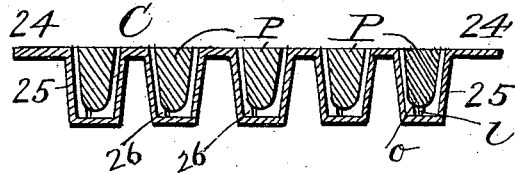
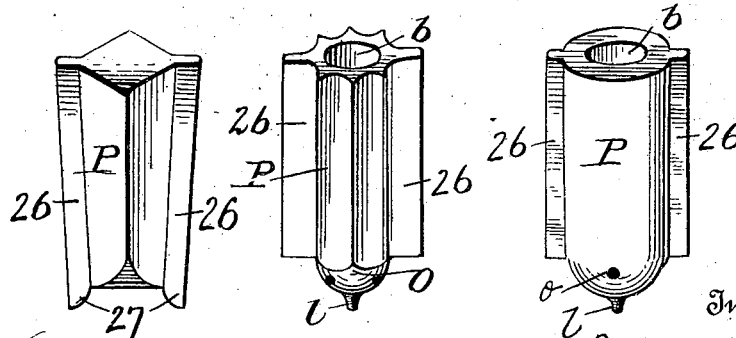


Fig. 5



Witnesses  
F. L. Ouraud  
Geo. H. Evans

Inventor  
F. V. Winters,  
by A. G. Heymann,  
Attorney

# UNITED STATES PATENT OFFICE.

FREDERICK V. WINTERS, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO  
JOHN A. YORK, OF SAME PLACE.

## RADIATOR AND HEATER THEREFOR.

SPECIFICATION forming part of Letters Patent No. 646,482, dated April 3, 1900.

Application filed July 25, 1898. Renewed August 31, 1899. Serial No. 729,127. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK V. WINTERS, a citizen of the United States of America, residing in the city of New York, in the State of New York, have invented certain new and useful Improvements in Radiators and Heaters Therefor, of which the following is a specification.

My invention relates to improvements in radiators and heaters therefor; and the objects are to provide and construct a radiator particularly adapted to the heater provided therefor, to provide a heater for radiators which is especially adapted for a single radiator or for a system of radiators connected and communicating by proper circulating-pipes, and to provide a radiator and heater of a novel and improved construction which is certain and efficient in operation, as will be hereinafter fully described, and the novelty of which will be particularly pointed out in the claims.

I have fully and clearly illustrated my invention in the accompanying drawings, wherein—

Figure 1 is a vertical longitudinal section through the radiator, showing the heater applied thereto. Fig. 2 is a vertical transverse section through the heater. Fig. 3 is a plan view of the water-pocket or lower section of the heater, showing circulating-plugs arranged in the water-pockets, the different forms in cross-section of the plugs being shown. Fig. 4 is a transverse central section through the water-pocket or socket-section shown in Fig. 3, showing the circulating-plugs inserted. Fig. 5 shows detail views of different forms of circulating-plugs.

A designates a steam or hot-water radiator consisting of a desired number of vertical pipes 1, communicating at their lower portion or base with each other by means of ports or openings 2 and at the top opening into the top chamber 3 of the radiator. The water is supplied through a filling tube or funnel 4, arranged in the end pipe of the radiator, and the tube is opened and closed by means of a turning plug 5 in the tube. The central or middle group or pair of pipes, as 6, 7, are made shorter than the other pipes forming the general assemblage of loops and reach down a

desired distance, substantially as shown, and communicate at their lower ends by a cross-pipe 8, which opens into a vertical pipe 9, opening at the upper end into the top chamber of the radiator. In the chamber or space S thus formed below the cross-pipe 8 are arranged oppositely-disposed pipes or ducts 10, 11, the upper ends of which open into the cross-pipe 8 and the lower ends open into the base of the next adjacent pipes of the radiator, substantially as indicated in the drawings. A water-gage *w* may be fixed to and connected with the pipe 11, as shown, to indicate the position of the water in the radiator. The construction of this water-gage is of the usual style, and its uses are well known.

B designates my improved heater especially made and constructed for use and application to a radiator of the kind herein shown, but which may be applied with equal usefulness to heating a system of circulating-pipes connected to boilers providing the heat in a system of radiators. This heater B has an outer top shell 12, having a vertical base 13, extending the desired height, and a conical or dome-shaped upper portion 14, terminating in a neck-piece 15, as indicated, which neck-piece may consist of a suitably-connected pipe extending to and opening into the cross-pipe 8, or it may be formed integral with the shell 12. An inner shell 16 of the contour and shape of the shell 12, but of smaller diameter and height, is arranged in and under the shell 12, the difference in size of the shells forming a water-circulating space 17 between them. The lower edge of the circulating-shell 16 is recessed or scalloped, as at 18, to provide ports to admit the cold water flowing down between the shells to be subjected to the hot surface of the heater and eventually be forced up from within the shell 16 through a hot-water pipe 19, extending through the neck-piece or pipe 15, through the cross-pipe 8, and reaching to or into the top chamber of the radiator, substantially as shown. This pipe 19 is the hot-water pipe leading from the heating-chamber of the heater and conveys the heated water to the top of the radiator by reason of the circulation induced by the action of the heater. The pipe 19 is of less diameter than the pipe

9, so that a circulating-space will be between the pipes. From shell 12 at the base thereof extend oppositely-disposed pipes 20 21, opening therefrom and extending to and opening into the base or bottom of such pipes of the radiator as may be selected. In these pipes 20 21 are fitted spigots 22, provided with turning-plugs, whereby when desired the water in the radiator may be drawn off. These pipes 20 21 support the heater in position and maintain it in relation to the radiator, and they also promote the desired circulation through the radiator and heater, as will be specified when the system or course of circulation is described. The shell 12 is formed with an annular edge flange 23, to which is secured by any suitable fastenings a similar flange 24 of the water-socket or water-pocket part or section C of the heater. This water-pocket portion consists of a flat and circular disk formed with a number of downward-extending sockets or pockets 25 for the reception of the circulating water and to present an enlarged and extended surface to the effects of the burner which is applied to the heater.

In each of the wells or sockets of the water-pocket section is deposited and placed a circulating-plug P of smaller diameter and somewhat shorter than the socket or pocket to which applied, so that a water-space is formed or provided between the walls of the socket and the face of the circulating-plug. To hold the plugs in relative and proper position to the walls of the socket, oppositely-arranged lateral flanges 26 are formed on them, and at the bottom are downward projections 27, so that the circulation will be down, under, and up the spaces between the plug and the socket. These circulating-plugs may be of different constructions, all competent and efficient to effect the purpose. They may be, as shown in the left-hand illustration of Fig. 5, square in cross-section and slightly tapering, with the lateral flanges extended below the bottom of the plug, as shown, or they may be circular in cross-section and fluted vertically and provided with lateral flanges extending the length of the flutes and having a convex or rounded lower end with central step-lug *l* to set on the bottom of the socket, and having openings *o* through the bottom, which openings lead into a central bore *b*, as shown in the middle illustration of Fig. 5, or they may be a plane cylinder with lateral flanges and rounded or conical bottom having openings or ports leading into the central bore of the plug, as shown in the right-hand illustration of Fig. 5, the primary form or construction of these plugs being a body of less diameter than the socket to which applied and formed with flanges to keep and maintain a water-space between the plug and the walls of the socket and some part or conformation to support the plug a proper distance above the bottom of the socket or pocket.

Under the heater is arranged a gas-burner *b'*, which is supported and secured in position by any suitable means, an inlet gas-pipe *c*, leading into the burner, and a flexible or other pipe *d* being thereto connected to conduct the gas to the burner. In the present instance the burner is formed with an upward-extending flange which is secured to the rim or flange of the heater.

In this application no claim is made for the radiator, except as the same forms a part of legitimate combinations with the heater described and claimed herein, as I have filed under date of September 8, 1898, Serial No. 690,515, a separate application therefor.

The operation is as follows: The water is introduced through the filling-tube and flows down the pipe to which the filling-pipe is connected, thence through the ports or openings at the bases of the first section or half of the series and eventually reaching to the top of the radiator, and then flowing through the top chamber of the radiator down the other section of the pipes and falls into the accumulated water in that part which has flowed into it through the small pipes at the base of the cross-pipe at the bottom of the short pipes of the radiator. At the same time the cold water flows down the neck-pipe of the heater into the heater and also to the heater through the lateral or branch pipes at the base. The water at ordinary temperature of filling is now in equilibrium throughout the radiator. Now when the heat is applied a circulation is speedily effected. The water in the heater becomes rapidly heated and is forced up through the hot-water pipe, thence through the top chamber, down the pipes, and to the heater through the small pipes at the base. At the same time a downward current or circulation is maintained down through the neck-pipe of the heater, through and spreading over the water-space, and into the heater through the recesses or ports at the base of the inner circulating-shell. The water in its course downward through the water-space of the heater becomes partially heated before it enters the inner shell, owing to its contact with the inner shell, so that the water-space of the heater acts in the nature of a feeder of warm water and does not lower the temperature of the inclosed water within the chamber of the inner shell.

What I claim is—

1. A radiator composed of a series of loops or pipes communicating at the bottom with each other and at the top opening into a common chamber in the radiator, two shorter pipes in the radiator connected at their lower ends by a cross-pipe, a vertically-extending pipe from the said cross-pipe and opening into the top chamber of the radiator, downward directed and extending pipes opening from said cross-pipe and having their lower ends secured and opening in adjacent pipes at the base thereof, a heater, a cold-water pipe lead-

ing from the cross-pipe to the heater, a hot-water pipe extending from the heater up through the cold-water pipe and the vertically-extending pipe, and laterally-extending pipes leading from the base of certain of the tubes or loops and opening into the heater at opposite sides, substantially as described.

2. A radiator composed of a series of loops or pipes communicating at the bottom with each other and at the tops opening into a common chamber in the radiator, two shorter pipes in the radiator connected at their lower ends by a cross-pipe, a vertically-extending pipe from the said cross-pipe and opening into the top chamber of the radiator, downward directed and extending pipes opening from said cross-pipe and having their lower ends secured and opening in adjacent pipes at the base thereof, a heater, a cold-water pipe leading from the cross-pipe to the heater, and a hot-water pipe extending from the heater up through the cold-water pipe and the vertically-extending pipe, substantially as described.

3. The water-heater comprising two coincident shells disposed one within the other with a water-space between them, and the inner shell being provided with ports to admit water, a bottom plate or section secured to the outer shell formed with a plurality of water pockets or sockets, a cold-water pipe secured to the outer shell to conduct cold water to the water-space, and a hot-water pipe secured to the inner shell to conduct the hot water therefrom, substantially as described.

4. The water-heater, comprising two coincident conical shells disposed one within the other with a water-space between them and the inner shell being provided with ports to admit water, a bottom plate or section secured to the outer shell and formed with a number of depending water pockets or sockets, a cold-water pipe secured to the outer shell to conduct cold water to the water-space, and a hot-water pipe secured to the inner

shell to conduct the hot water therefrom, substantially as described.

5. The water-heater, comprising two coincident conical shells disposed one within the other with a water-space between them, and the inner shell being provided with ports to admit water from the water-space, a cold-water pipe opening into the outer shell, a hot-water pipe leading from the inner shell, a bottom plate or section secured to the outer shell and formed with a number of depending water-sockets, and oppositely-arranged pipes opening into the water-space substantially parallel with the floor of the bottom of the heater.

6. The water-heater comprising two coincident shells disposed one within the other with a water-space between them and the inner shell being provided with ports to admit water, a bottom plate secured to the outer shell and formed with depending pockets, and plugs of less diameter than the pockets, provided with lateral flanges, said plugs adapted to fit into the pockets and spaced from the bottom thereof.

7. The water-heater comprising two coincident shells disposed one within the other with a water-space between them and the inner shell being provided with ports to admit water, a bottom plate secured to the outer shell and formed with a number of depending water-pockets, circulating-plugs of less diameter than the water-pockets disposed therein, a cold-water pipe secured to the outer shell to conduct cold water to the water-space, and a hot-water pipe secured to the inner shell to conduct the hot water therefrom, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK V. WINTERS.

Witnesses:

A. G. HEYLMUN,  
JNO. A. YORK.