

No. 718,931.

PATENTED JAN. 20, 1903.

J. G. HASTINGS.
HEATER.

APPLICATION FILED DEC. 30, 1901.

NO MODEL.

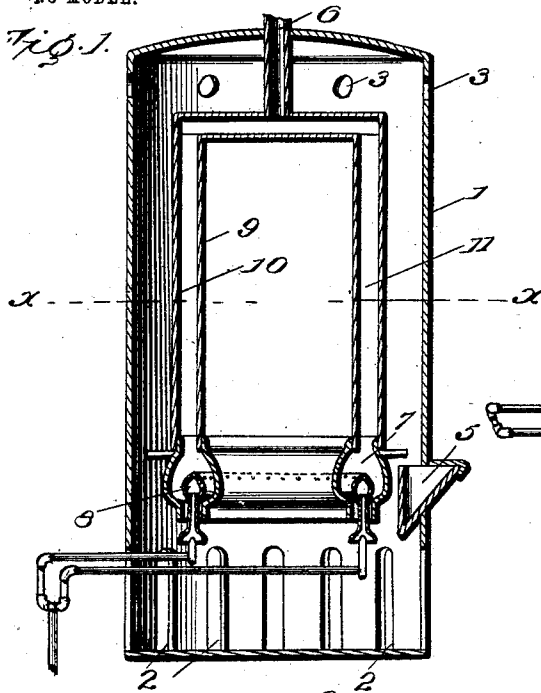


Fig. 2.

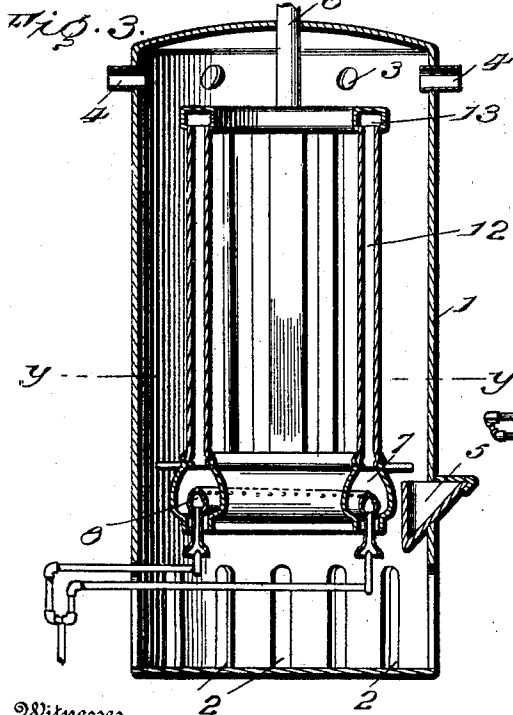
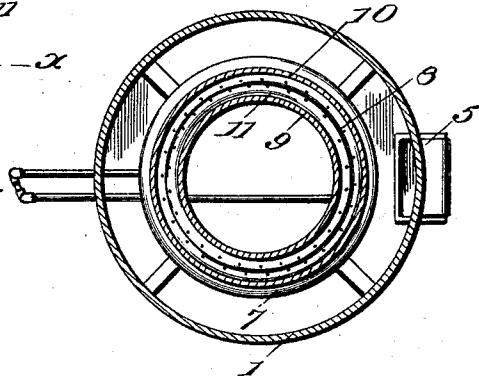
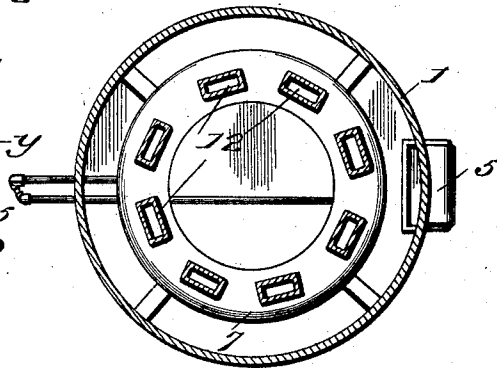


Fig. 4.



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Witnesses

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UNITED STATES PATENT OFFICE.

JAMES G. HASTINGS, OF ASPINWALL, PENNSYLVANIA.

HEATER.

SPECIFICATION forming part of Letters Patent No. 718,931, dated January 20, 1903.

Application filed December 30, 1901. Serial No. 87,776. (No model.)

To all whom it may concern:

Be it known that I, JAMES G. HASTINGS, a citizen of the United States, residing at Aspinwall, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Heaters; 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 appertains to make and use the same. This invention relates to heaters of the type designed to burn gas, vapor, or hydrocarbon, and has for its object to utilize a maximum amount of the caloric resulting from combustion for effective work in heating.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical central section of a heater embodying the invention. Fig. 2 is a horizontal section on the line X X of Fig. 1. Fig. 3 is a view similar to Fig. 1 of a modification. Fig. 4 is a plan section on the line Y Y of Fig. 3.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The body of the heater comprises a shell or casing 1, which may be of any size and form and which is provided at its lower end with openings 2 for the admission of air and at its upper end with one or more openings 3 for the outflow of the air after it has become heated. If a distant room or space is to be heated, a pipe or pipes may be connected to one or more of the openings 3, as shown at 4 in Fig. 3. To render the hot air moist, a receptacle 5 for containing water is applied to a side of the shell 1. A drum is located within the shell or casing and is spaced therefrom, and its upper end is provided with a pipe 6 for carrying off fumes, and its lower end is

fashioned to provide a combustion-chamber 7, in which the burner 8 is located. The combustion-chamber 7 is of annular form in transverse section and is swelled midway of its ends and contracted toward the top and bottom, the swell or enlarged portion receiving the burner 8. The swelled or enlarged combustion-chamber 7 is so constructed as to conform to the shape of the flame issuing from the burner 8. It is characteristic of such a flame to belly out at the lower part and to taper to a point at its upper extremity. The construction heretofore noted is adapted to admit of an approximately uniform width of air-space between the sides of the annular chamber 7 from the contracted part at its lower end through the swelled portion and again at the contracted part at the juncture of the combustion-chamber with the drum. As shown in Figs. 1 and 2, the body of the drum is composed of concentric shells 9 and 10, between which is formed a space 11. In the construction shown in Figs. 3 and 4 the body portion of the drum consists of a series of pipes 12, spaced apart and having their lower ends connected with the combustion-chamber 7 and their upper ends joined to an annulus or header 13. The fumes and hot air coming directly from the burner 8 pass through the drum and to the chimney (not shown) by way of the pipe 6. The drum radiates heat from its inner and outer surfaces, and the air passing through the shell or casing 1 both within and without the drum is heated and escapes into the room or may be conveyed to a remote apartment for warming the same. The cold air entering the lower portion of the shell 1 through the openings 2 or in any other convenient way passes upward around the drum and through the space inclosed by the inner shell or part of the said drum and is heated in its upward travel and passes out from the upper portion of the shell 1 through the openings 3 and 4.

The burner 8 may be of any variety for burning gas, vapor, or hydrocarbon and is preferably of annular form and is located within the combustion-chamber 7. The lower end of the combustion-chamber is open and spaced from both sides of the burner, so as to freely admit air, whereby combustion

is supported and the flames intensified, so as to prevent the giving off of free carbon, which is objectionable in devices of this kind.

Having thus described the invention, what
5 is claimed as new is—

In a heater, a drum, a combustion-chamber at the lower end of the drum comprising upper and lower contracted portions in vertical alinement and an intermediate swelled
10 portion having its side walls symmetrically

curved in opposite directions, and a burner located in the swelled portion of the combustion-chamber, substantially as described.

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

JAMES G. HASTINGS. [L. S.]

Witnesses:

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