

UNITED STATES PATENT OFFICE.

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HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 675,919, dated June 11, 1901.

Application filed June 12, 1900. Serial No. 20,068. (No model.)

To all whom it may concern:

Be it known that I, ISAAC V. ARVONEN, a citizen of the United States, residing at Calumet, in the county of Houghton and State of Michigan, have invented a new and useful Heating Apparatus, of which the following is a specification.

My invention relates to an improved heating apparatus; and the object thereof is to provide means for quickly generating steam at the expense of a minimum amount of fuel to be distributed to the places desired and also to serve as a heat-radiating structure for the apartment in which it is located.

With the above objects in view the invention consists in the novel features of construction hereinafter fully described, particularly pointed out in the claims, and clearly illustrated by the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a heating apparatus embodying my invention. Fig. 2 is an elevation, partly in section, of portions of the same, being separated; and Fig. 3 is a sectional view, partially in perspective, showing the furnace or burner portion adapted for a different kind of fuel.

Referring more particularly to the drawings, 1 indicates the base of my heater, which may be of any suitable size and construction and upon which is mounted a cylindrical drum 2. Suspended within the drum is a reservoir 3, the lower end of which is preferably concaved, as shown at 4, and the upper end is provided with a flanged rim 5, which is adapted to rest upon the upper edge of the drum 2 and support the reservoir therein. The interior of the drum is provided with a spiral flange 5', which extends from the top to the bottom and projects inwardly to the reservoir, thereby forming a passage for the products of combustion.

Extending from the top to the bottom of the drum 2 is a coil 6, the lower end of which is extended up on one side, as shown at 7, and is connected at its upper end with the upper end of the reservoir by means of an opening 8. The extension or pipe 7 is provided at its upper end with a suitable joint or union 9, by means of which the pipe may be separated for the removal of the reservoir

from the interior of the drum 2 for any purpose.

A suitable water-tank 10 is secured to the upper end of the reservoir in any suitable manner—as, for instance, by means of a short pipe or coupling 11, within which is located a valve 12. The upper end of the coil 6 is extended upward and coiled around the tank, as shown at 13, and from thence it can be passed through the wall or ceiling 14 or lead to any point where it is desired to convey the steam. The object of extending the coil 6 about the drum 2 and the water-tank 10 is to increase the radiating-surface and to heat the contents of the water-tank. The pipe where it extends up to the water-tank is separable for the purpose of removing the pipe, and, if desired, the pipe above the tank may be provided with a suitable safety-valve 15.

The rim of the reservoir is provided with a flue or smoke-pipe 16, which communicates with the spiral passage between the reservoir and the drum and extends upwardly to any suitable escape. A suitable damper 17 is located in the pipe 16 at any suitable point for regulating the escape of the products of combustion, which pass out from the dome-shaped recess in the bottom of the reservoir and up around the spiral passage between the reservoir and the drum.

In Fig. 1 of the drawings I have shown the heater provided with an oil-burner 18; but it is evident that any other suitable fuel may be used by providing the heater with the proper appliances. For instance, in Fig. 3 of the drawings I have shown an ordinary grate or basket 19 within the opening in the top of the base in which coal or any other suitable fuel may be burned.

In using my improved heating apparatus the parts are assembled as above described and a fire started within the furnace. The reservoir is kept empty until it begins to get hot, when the valve between it and the water-tank may be opened, so as to permit the water to slowly run into the reservoir from the tank until it is about one-quarter full. In this manner the small amount of water in the reservoir is quickly heated and converted into steam, which passes out through the pipe 7 down to the bottom of the coil 6 and from

there up around the drum 2, where it absorbs more heat from the products of combustion between the spirals 5', then up around the water-tank, and from thence to the point
 5 where desired. The water of condensation that may form in the pipes can be permitted to escape by any ordinary means, as a petcock or valve 6', (shown at the bottom of coil
 10 6 in Fig. 1,) into a pan or receptacle to receive the same. The heat and the incoming stream of water can be so adjusted relatively to each other that the water can be quickly heated and converted into steam with the use of a minimum amount of fuel. The water-
 15 tank may be large enough to contain the desired amount of water to be converted into steam or it may be connected with any source of supply in the usual manner.

If at any time it be desired to use a different kind of fuel, the burner, which is removably secured within the base, can be taken out and the desired form of burner inserted in its stead, when the apparatus can be used as before.

25 Although I have shown what I consider the most desirable form of constructing my improved heating apparatus, yet I reserve the right to make such changes and alterations therein as will come within the scope of my
 30 invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

35 1. In a heating apparatus, the combination, with a drum, of a reservoir suspended therein, a spiral flange between the drum and reservoir, a coil-pipe around the drum, the lower end of which communicates with the upper
 40 end of the reservoir, and the upper end is provided with an outlet, a heater below the reservoir, and a smoke-pipe communicating with the space between the drum and reservoir at the upper end thereof, substantially
 as described.

45 2. In a heating apparatus, the combination, with a drum, of a reservoir suspended therein, the upper end of the reservoir being provided with a flanged rim, and the lower end

with a dome-shaped recess, a spiral flange between the drum and the reservoir, a coil-pipe
 50 around the drum, the lower end of which communicates with the upper end of the reservoir, a heater below the reservoir, and a smoke-pipe extending from the rim of the reservoir between the reservoir and the drum, 55
 substantially as described.

3. In a heating apparatus, the combination, with a drum, of a reservoir suspended therein, the top of which is provided with a flanged rim in detachable engagement with the upper
 60 end of the drum, a spiral flange between the drum and the reservoir, a coil-pipe around the drum, the lower end of which is extended upwardly and is detachably connected with the upper end of the reservoir, and the upper
 65 end is provided with an outlet, a heater below the reservoir, and a smoke-pipe communicating with the space between the drum and the reservoir, substantially as described.

4. In a heating apparatus, the combination, 70
 with a drum, of a reservoir suspended therein, a water-tank detachably secured to the upper end of the reservoir and provided with a valve, a coil-pipe around the drum, the lower end of which is connected with the upper
 75 end of the reservoir and the upper end is extended and coiled around the water-tank, and provided with an outlet, and a heater below the reservoir, substantially as described.

5. In a heating apparatus, the combination, 80
 with a base provided with an opening in its top and with a removable heater, of a drum upon the base, a reservoir suspended within the drum, a coil-pipe around the drum, the lower end of which communicates with the
 85 upper end of the reservoir and the upper end is provided with an outlet, a smoke-pipe communicating with the space between the drum and the reservoir at the upper end, and means for supplying the reservoir with water, 90
 substantially as described.

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Witnesses:

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