(No Model.) 3 Sheets—Sheet 1.

E. E. ASHLEY.

HEATING APPARATUS.

No. 520,911. Patented June 5, 1894.

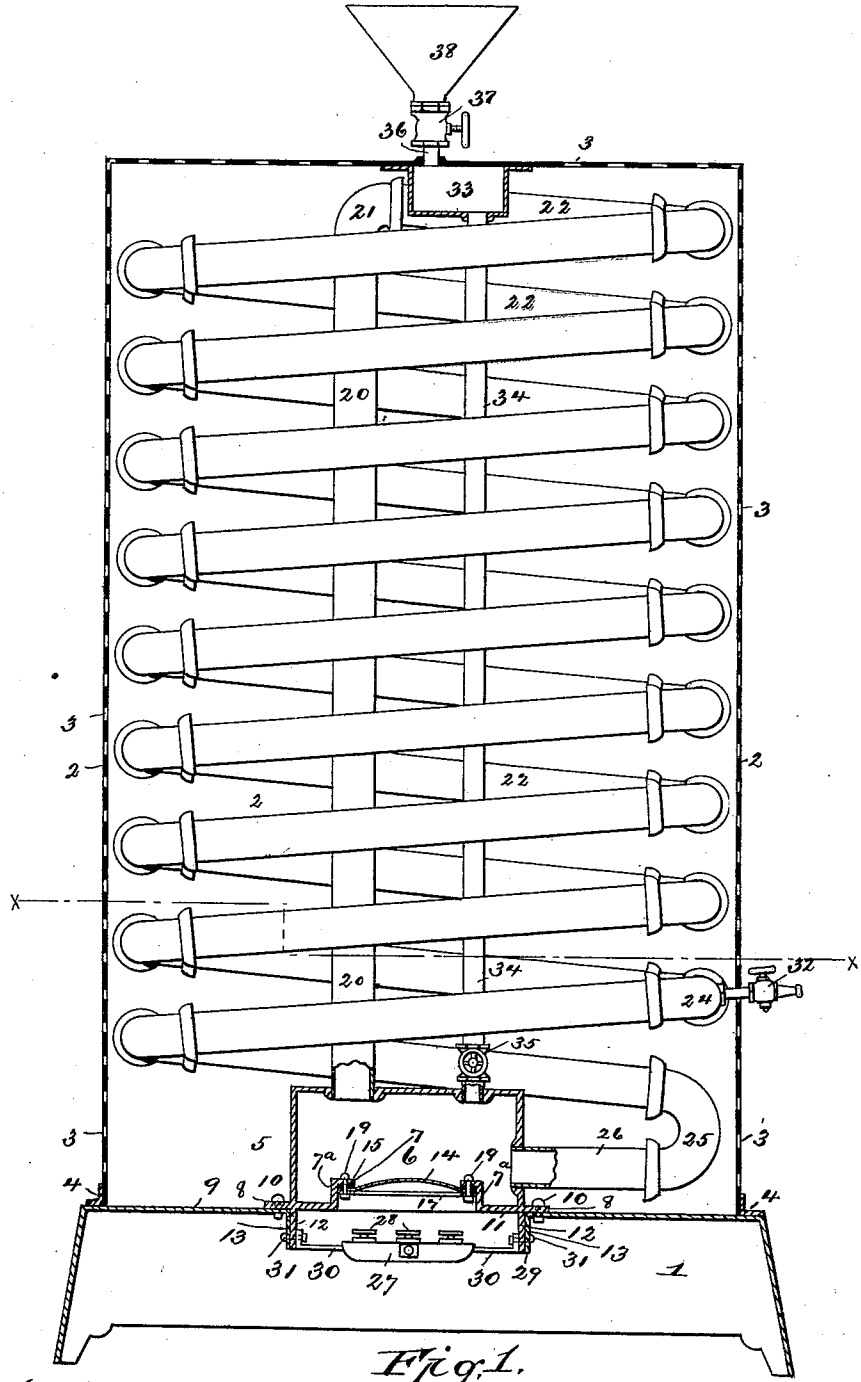

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2..

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HEATING APPARATUS.

No. 520,911. Patented June 5, 1894.

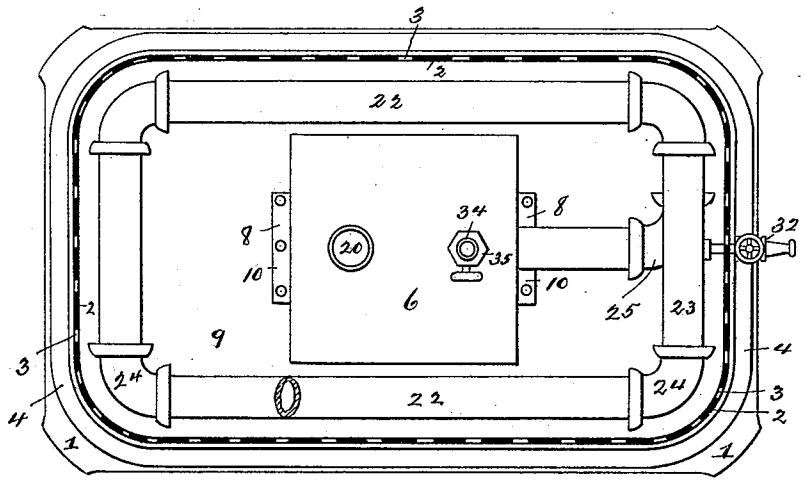

Fig. 2.

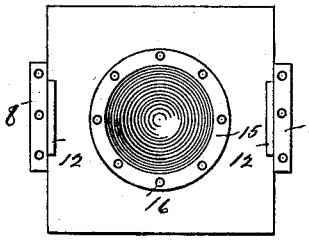

Fig. 3.

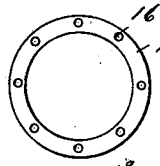

Fig. 4.

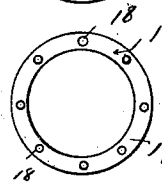

Fig. 5.

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(No Model.) 3 Sheets—Sheet 3.

E. E. ASHLEY.

HEATING APPARATUS.

No. 520,911. Patented June 5, 1894.

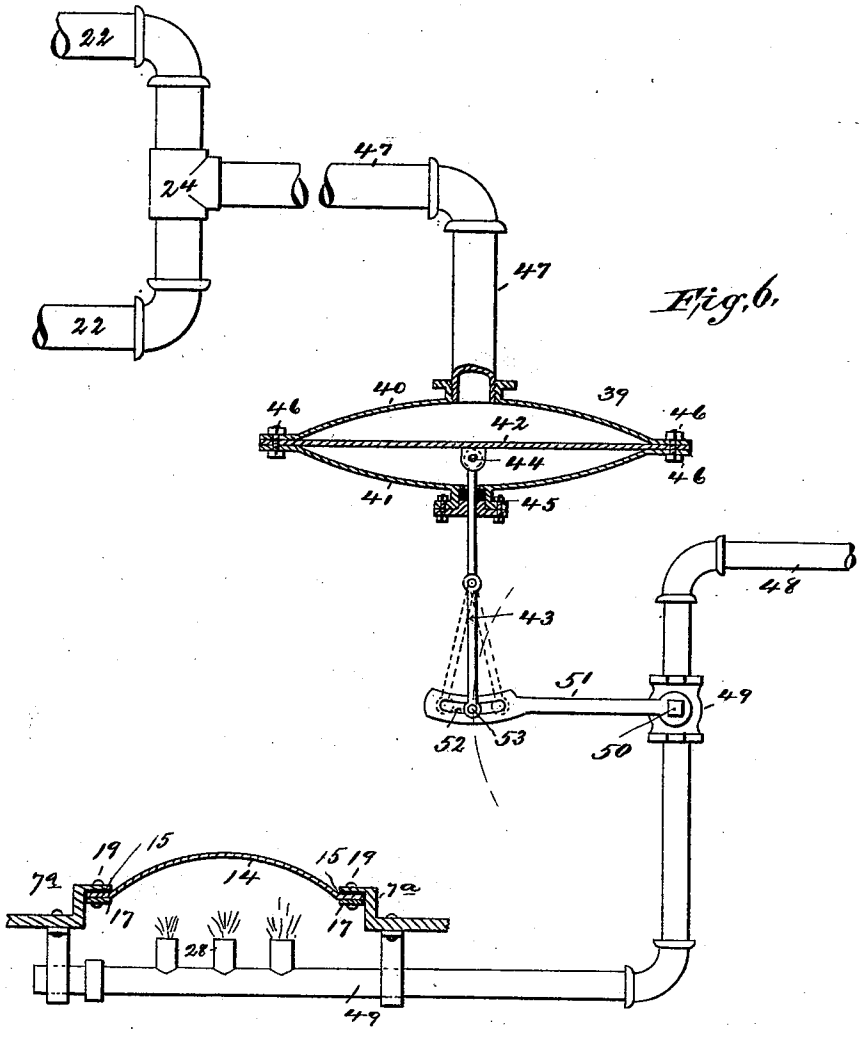

Fig. 6.

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UNITED STATES PATENT OFFICE.

EDWARD E. ASHLEY, OF NEW YORK, N. Y.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 520,911, dated June 5, 1894.

Application filed February 23, 1893. Serial No. 463,295. (No model.)

To all whom it may concern:

Be it known that I, EDWARD E. ASHLEY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have made certain new and useful Improvements in Heating Apparatus, of which the following is a specification.

My invention relates to independent or isolated heating devices, and comprises a suitable generator, a coil for circulating steam or hot water leading from the generator and returning thereto, and devices for supplying the generator with water and for interchangeably using the device for hot water or steam circulation.

My invention also comprises in combination with the other novel features, of a stand pipe and a reservoir which can be used for the purpose of filling the generator with water or can be used for the purpose of holding a regulated supply of water to be fed to the generator when the amount therein has been diminished by leakage or evaporation.

As my invention is capable of use with either gas or oil as a heating medium for a generator, I have shown devices for utilizing those mediums.

My invention further consists of the details of structure hereinafter described and further pointed out in the claims.

In the accompanying drawings forming part of this specification—Figure 1 is a sectional elevation of the generator and radiator, with an oil burner secured under the generator for the purpose of heating the same by oil; Fig. 2, a plan and cross section of Fig. 1, taken approximately on the line *x x* of that figure; Fig. 3, a bottom view of the generator with the burner removed; Figs. 4 and 5, respectively, plan views of the metallic and asbestus gaskets; Fig. 6, a diagrammatic view showing a device for automatically regulating the amount of heat supply to the generator and thereby the temperature of the hot water or the pressure of steam in the regulating and circulating coil.

Like numerals of reference refer to like parts in all the views.

In the drawings 1 is a cast iron base of any suitable form or construction, and upon this is mounted a preferably circular jacket 2 having perforations 3 therein, the jacket being secured upon the base by the angle iron 4.

The generator 5 consists of a cast iron shell 6 having at the bottom an annular dome 7^a having a ledge 7. The shell is provided with lugs 8 at each side (see Fig. 3) by means of which the generator is bolted to the top plate 9 of the base 1 by means of the bolts 10. Depending from the bottom 11 of the shell 6 are ears 12 against which abut ears 13 depending from the top plate 9 of the base 1. Secured within the dome 7^a is a circular and preferably convex crown sheet 14 of copper so as to readily transmit the heat, and between the metal and the ledge 7 and the crown sheet is interposed an asbestus gasket 15 provided with a series of holes 16, and below the crown sheet lies a collar 17 likewise provided with holes 18, the gasket 15, crown sheet 14 and collar 17 being secured in the dome 7^a by means of the nut bolts 19 which pass through the holes in both the collar and gasket. The crown sheet is thus detachably secured, so that it can be readily removed if burned out. The circulating and radiating coil comprises a vertical stand pipe 20 which enters the top of the shell 6 in the usual way, and connects by means of an elbow 21 with the sections 22, 23 united by the elbows 24, the sections 22, 23 and elbows 24 being continued downwardly in turns which return to the generator through the elbow 25 and short pipe 26.

The particular form of coil and the configuration of the generator is immaterial, except that I desire to use a vertical riser 20, and let the hot water or water of condensation return by gravity to the generator, the return inlet being below the top of the shell 6.

If it is desired to use oil as a heating medium, a multi-wick lamp, such as shown in Fig. 1, can be used, which comprises the reservoir 27 having the burners 28, and filling vent 29 which is secured by arms 30 to both the ears 12 and the ears 13 by means of the bolts 31 which pass through them. A pet cock 32 secured to one of the turns of the radiating coil extends from without the jacket, and can be used for the purpose of testing the coil for steam or water.

It is apparent that if heat is applied to the crown sheet of the generator, the water there-

in will become heated, and if the coil and generator are filled with water, the same will circulate through the coil and return back to the generator, constantly bringing a fresh heating medium in contact with all the parts of the coil, heating the air within the jacket, and the jacket itself, the heated air moving out of the jacket through the perforations and the jacket, itself giving off heat by radiation.

For supplying the generator with water and for keeping a storage of warm water ready to be used to make up for evaporation, &c., I use the following: Secured to the top of the jacket is a tank 33 of any suitable size, which extends above the top of the coil, the tank and the shell 6 being connected by a stand pipe 34 which enters the top of the shell in the usual way. It is apparent that if water is poured into the tank, which water has a sufficient head, it will flow into the shell up into the stand pipe 20, then downward through the turns of the coil, back to the generator again, completely filling both the coil and the generator, after which connection between the tank and the generator can be closed by means of the valve 35 in the pipe 34. The pipe 34 is located within the coil and becomes heated by radiation therefrom, and to supply warm or cold water, as before set forth, the pipe 34 and tank are filled with water, the valve 35 closed and the water therein permitted to remain long enough to become heated, when the valve 35 can be opened and a fresh supply of warm water from the stand pipe and tank 33 can be supplied to the generator. The tank 33 can be put in direct communication with a regular source of supply by means of the pipe 36, in which a valve 37 is interposed, or a funnel 38 can be used, as shown, to either constantly supply water or to give a supply of water, and controlled by the valve 37, to make up for the loss of water by evaporation or leaking. As will be seen from Fig. 1 the tank 33 is closed, except when the valve 37 is opened to permit of the entry of water. If steam is to be used as a heating and radiating medium then the cock 35 in the stand pipe 34 will be closed. If a hot water circulation is to be used then the pipe 34 will be filled with water and the cock 37 closed.

If it is desired to use only heated water as a circulating medium, the generation of steam can be prevented by using gas or oil burners of sufficient size to only heat the water to make it circulate; but if steam is to be used as the heating medium, I prefer to use an automatic device which will regulate the temperature. Instead, however, of regulating the temperature by means of the particular size of burner, as before described, when hot water is used, I can use an automatic device for this purpose also. This device I have illustrated with the use of gas as a heating medium.

Reference is had to Fig. 6 in which a pressure regulator 39 is formed by the two metal halves or sections 40, 41 and an interposed flexible diaphragm 42 to which diaphragm a toggle rod 43 is connected by a pin 44, the rod passing through a stuffing box 45, the two sections 40, 41 and the diaphragm being bolted together, as shown, by the bolts 46. A regulator built in this form or any other desired form can be used. A pipe 47 leads to the circulating coil so that the diaphragm chamber of the regulator will be in direct communication therewith and the diaphragm be effected by the pressure therein. A pipe 48 leads to a suitable burner 49 to supply gas or other like heating medium, and interposed in the pipe 48 is a valve casing 49, the valve stem 50 of its valve being connected to the rod 43 by a lever 51 having a segmental slot 52, and through the slot and rod 43 passes a set screw 53, so that by moving the set screw and arm 43 in the slot 42 the same can be adjusted therein to give the lever 51 varying throws, and the valve in the valve casing 49 any desired degree of movement and increase or decrease the supply of gas or other heating medium. Should it be desired to heat the water to a degree at which steam is generated, the burners being capable of combusting enough of the gas or other medium for this purpose, the play of the lever 51 can be regulated so as to supply enough gas to generate steam. If hot water is only to be made, the relation of the rods 43 and 51 can be adjusted so as to supply but sufficient heating medium for this purpose. It is also plain that the regulator can be used for burners for hydro-carbon oils as well as gas.

Having thus described my invention, I claim—

1. The combination with the shell 6, of the dome 7^a having an aperture therein, the crown sheet 14 lying within the aperture, a non-combustible gasket between the crown and the dome, the crown sheet and the gasket being secured to the dome, substantially as described.

2. The generator shell 6 having the ears 8 secured to a suitable base 9, the dome 7^a, crown sheet 14 secured within the dome, the stand pipe 20 arising from the shell, the return sections of the coil entering the shell below its top, and a heating device suspended below the crown sheet, substantially as described.

3. The combination with the generator shell 6, of the dome 7^a rising therein, and a crown sheet 14 detachably secured within the dome, substantially as described.

4. The combination with the generator, of the base having an opening therein for the reception of the generator, a dome within the generator, the detachable crown sheet within the dome, a circulating and radiating coil comprising the stand pipe 20 having its exit from the top of the generator, and a series of descending coil sections returning to the generator below the exit of the pipe 20, a burner

supported below the generator, and a water supply pipe for the generator, substantially as described.

5. In a heating apparatus, the combination with the generator shell 6 having an opening in the bottom 11 thereof, a dome rising from said bottom around said opening a convex crown sheet 14, and a non-conducting gasket interposed between the crown sheet and the dome, both the crown sheet and gasket being detachably secured within said dome, substantially as described.

Signed in the city, county, and State of New York this 16th day of February, 1893.

EDWARD E. ASHLEY.

Witnesses:
B. S. WISE,
M. F. DALY.