

No. 888,413.

PATENTED MAY 19, 1908.

S. D. WOODS & V. W. SIPES.

HEAT RADIATOR.

APPLICATION FILED JAN. 3, 1908.

FIG. I.

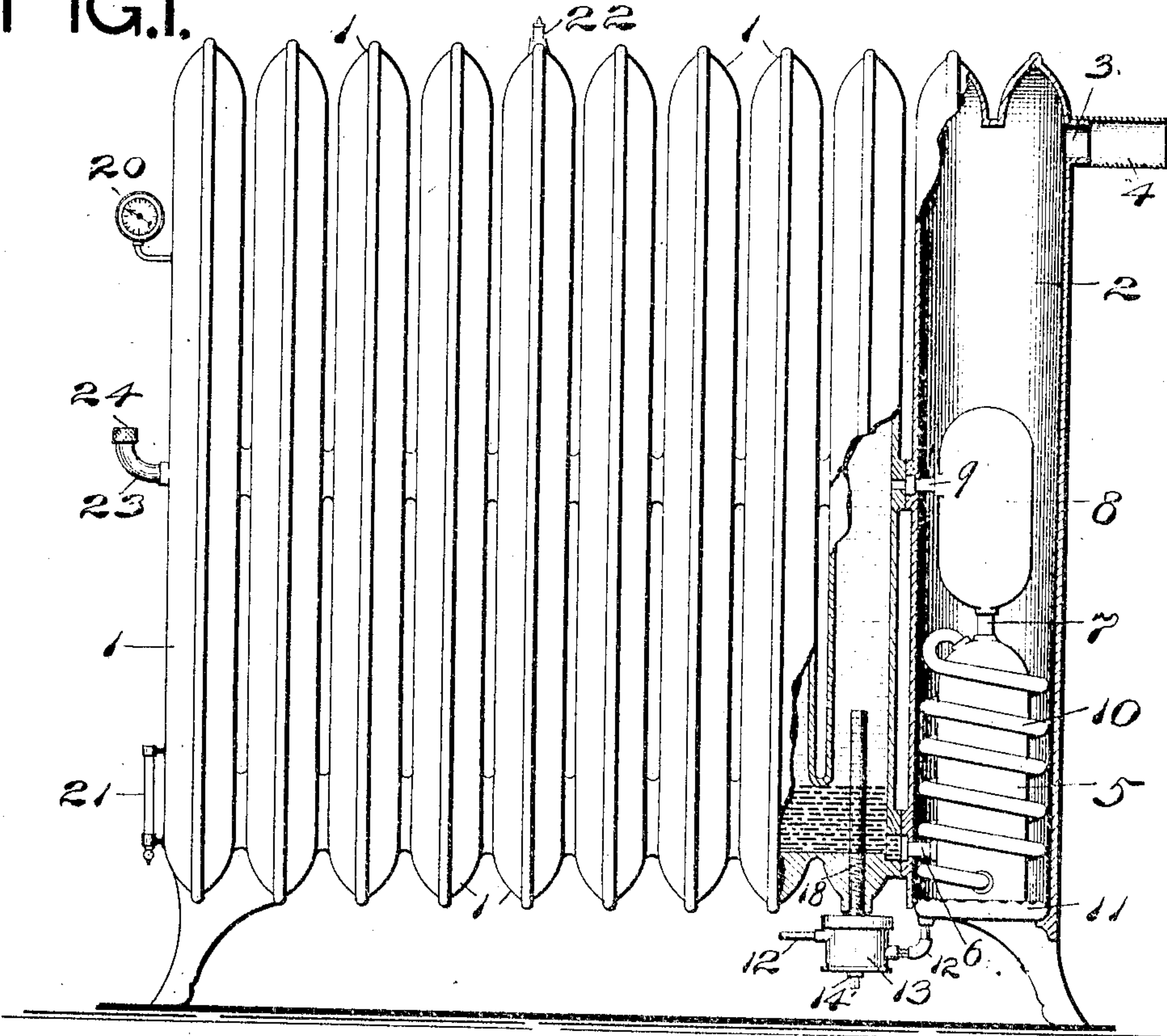


FIG. II.

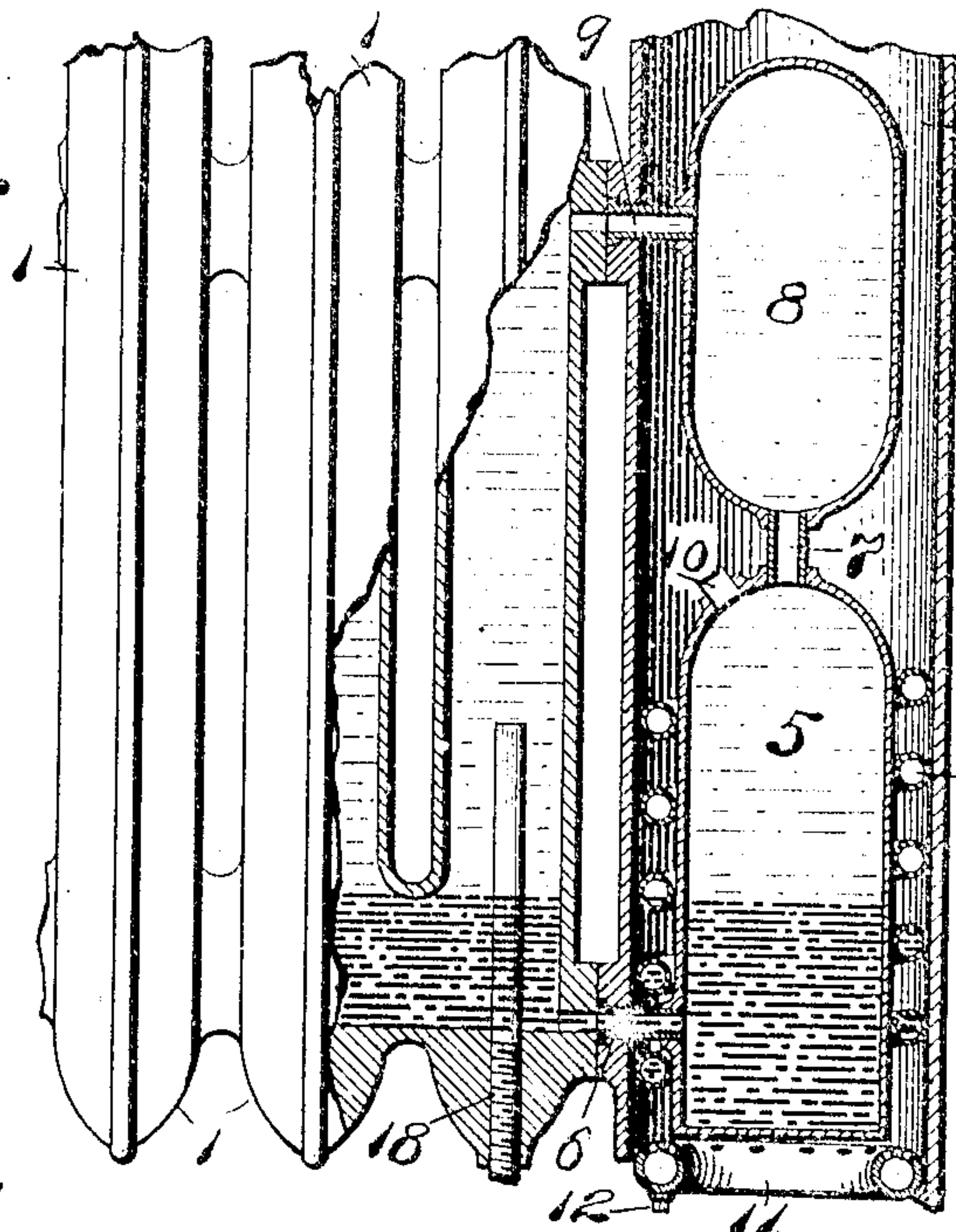
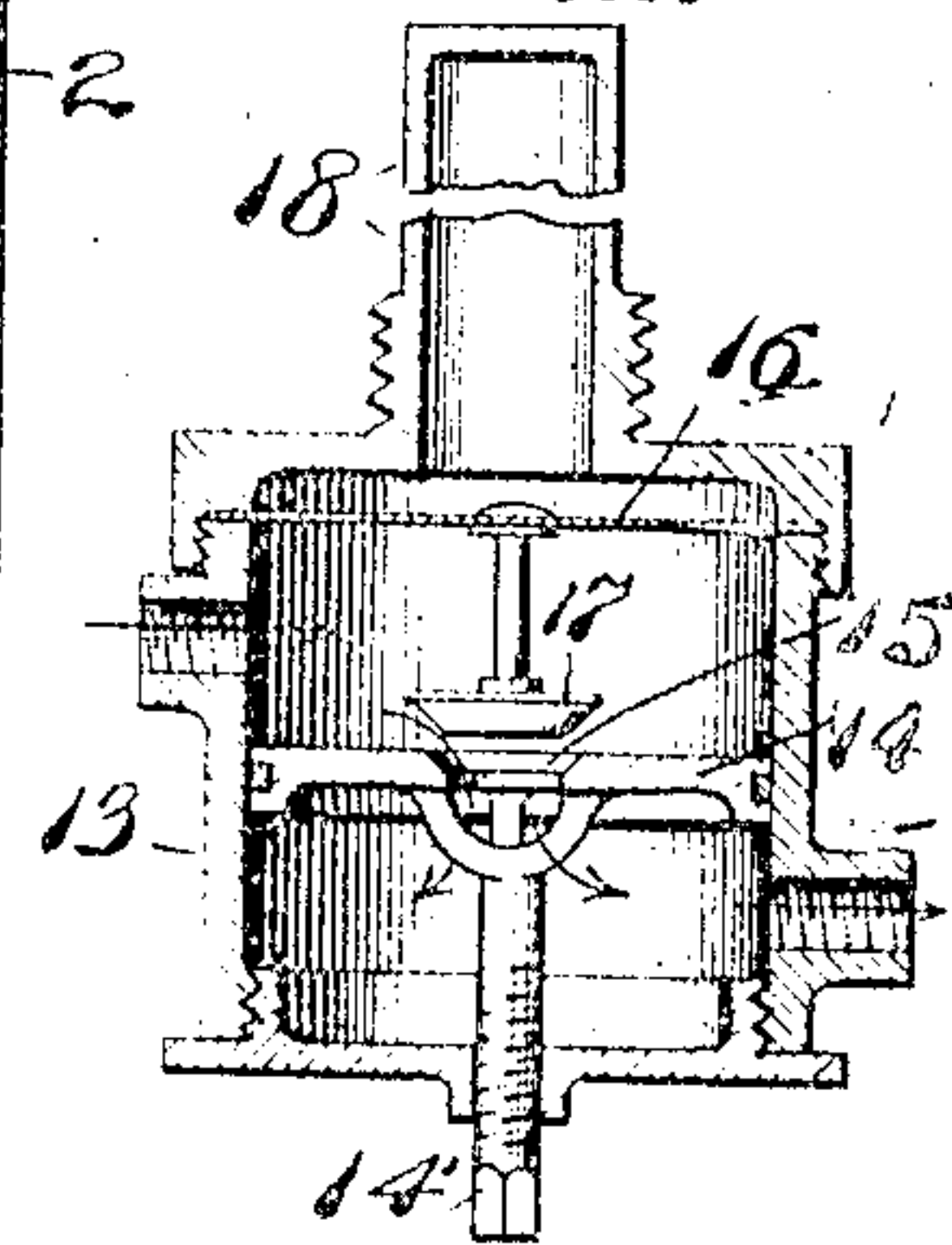


FIG. III.



Witnesses

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UNITED STATES PATENT OFFICE.

SAMUEL D. WOODS AND VICTOR W. SIPES, OF CONNELLSVILLE, PENNSYLVANIA; SAID SIPES ASSIGNOR OF ONE-HALF OF HIS RIGHT TO JOHN Y. WOODS AND ONE-HALF OF HIS RIGHT TO ALEXANDER H. COUGHANOUR, OF CONNELLSVILLE, PENNSYLVANIA.

HEAT-RADIATOR.

No. 888,413.

Specification of Letters Patent.

Patented May 19, 1908.

Application filed January 3, 1908. Serial No. 409,153.

To all whom it may concern:

Be it known that we, SAMUEL D. WOODS and VICTOR W. SIPES, citizens of the United States, residing at Connellsville, in the county of Fayette and State of Pennsylvania, have invented certain new and useful Improvements in Heat-Radiators, of which the following is a specification.

Our invention relates to improvements in steam radiators, particularly to that class of independent heaters wherein the generator and radiator are combined or associated in the one structure, said invention having for its object the provision of certain new and novel features to increase the efficiency thereof and economy of operation, as will be hereinafter more fully set forth and particularly pointed out in the appended claims.

In the accompanying drawings, which form a part of this specification, we have illustrated our invention by several views, wherein:

Figure I, is a side elevation of the improved heater, a portion of which is shown in section to disclose the interior parts. Fig. II, is an enlarged portion of a similar view, also shown partly in section for a further disclosure of the interior parts, and Fig. III, is a vertical section through the automatic gas regulator. Like detail parts of the structure disclosed in said views being designated by like numerals of reference in the following description.

The radiator proper may be of any approved form, it being in this instance composed of a plurality of like sections 1, to which we attach a suitable casing 2 having an opening 3 at the top thereof whereby the same may be connected to a chimney flue, by a pipe 4, to carry off offensive fumes occasioned by combustion. Located within this casing is a boiler or primary steam generator 5, which is connected at its base, with the radiator, by a short pipe 6, and at its top, by a similar pipe 7, to a dry or super-heating steam chamber 8, which chamber is also located within the said casing and is in turn connected to the radiator by a short pipe 9. In connection with the primary generator we also employ a secondary generator, consisting of a coiled pipe 10 surrounding the generator and occupying the major portion of the space between the same and interior walls of the casing, said coil being connected

at its lower end to the lower end of the primary generator and at its upper end to the upper end of the same. Located beneath the said primary and secondary generators, more directly beneath the latter, is a gas burner 11, of annular form, which burner is connected to a gas supply line 12, said line having included therein an automatic gas controlling device, comprehending a chamber 13, having therein a vertically adjustable valve seat 14 mounted upon a stem 14' for adjustment thereof, said seat being located between the inlet and outlet openings communicating with the gas line and is provided with a communicating or valve orifice 15, said chamber being further provided with a fixed diaphragm 16 carrying a downwardly disposed valve 17 above which diaphragm is arranged a closed tubular extension 18 which passes up into the radiator for some distance above the water line 19.

To the radiator portion proper, we attach a steam gage 20 to note the steam pressure, a water gage 21 to determine the water level, a pop or relief valve 22 as a precaution against accidental high pressure, and in addition thereto we attach an upturned tubular connection 23, provided with a cap 24, whereby the supply of water in the radiator may be replenished when occasion demands.

In practice, the gas being lighted, the water in the primary generator becomes heated and the resultant steam therefrom passes up into the super-heater where it assumes a practically dry state preparatory to entering the radiator for radiation of heat to the surrounding atmosphere. Furthermore, the secondary heater or coil presenting a large surface area to the heat and as the heat passes over and around between and with the convolutions of the coil, in its ascent, the water and moisture therein assumes a high degree of temperature and consequently occasion rapid steam generation, which steam passes with that of the primary generator up into the super-heater for service in the radiator, which steam after expending its heat in the radiator, condenses and returns to the bottom for further use. As the temperature gradually increases, the air in the tube 18 expands and acts upon the diaphragm of the gas controlling device, causing the attending valve to descend gradually therewith toward the seat orifice, thereby decreasing the sup-

ply of gas through said orifice to the burner with a consequent decrease in steam generation. As the temperature is again restored to slightly below that of normal the air in the tube cools thus permitting the diaphragm and attending valve to attain their former positions with a consequent increase of gas to the burner, said automatic control of the gas supply continuing without any perceptible change in heat radiation.

It will be evident that if the tube 18, of the valve or gas controlling device, was open that the same results could be obtained by steam pressure as by air expansion in the closed tube. Furthermore, it will be apparent that the apparatus as a whole, could be successfully employed as a hot-water heater as well as a steam-heater. It will also be apparent that the structure disclosed and operation thereof will automatically insure a normal temperature and economy of fuel.

Having thus fully shown and described our invention, what we claim and desire to secure by Letters Patent is:

1. The combination with a plurality of vertically disposed communicating radiator sections, of a like disposed and alining section connected thereto and forming a casing, a primary steam generating chamber in said casing communicating at its base with the base of the adjacent radiator section below the water line, a dry-steam chamber located in said casing above the said generator communicating at its upper end with the adjacent radiator section above the water line and at its lower end with the upper end of said generator, a gas burner beneath said primary generator, and a pressure actuated gas controlling device in the gas line, said device comprising a chamber in the line, a valve seat therein between the inlet and outlet openings, a diaphragm located in said chamber above the valve seat and having a valve depending therefrom, and a vertically disposed tubular extension on said chamber extending up into the radiator.

2. The combination with a plurality of vertically disposed communicating radiator sections, of a like disposed and alining section connected thereto and forming a casing, a primary steam generating chamber in said casing communicating at its base with the base of the adjacent radiator section below the water line, a secondary generating coil surrounding said primary chamber and connected at its upper end with the top and at its lower end with the bottom of said primary chamber, a dry-steam chamber located in

said casing above the said generators communicating at its upper end with the adjacent radiator section above the water line and at its lower end with the upper end of said primary generator, a gas burner beneath said generators, and a pressure actuated gas controlling device in the gas line, said device comprising a chamber in the line, a valve seat therein between the inlet and outlet openings, a diaphragm located in said chamber above the valve seat and having a valve depending therefrom, and a vertically disposed tubular extension on said chamber extending up into the radiator.

3. The combination with plural vertically disposed radiator sections, of a like disposed and alining casing connected thereto, a primary generating chamber, a secondary generating coil and a dry-steam chamber arranged in said casing and connected to one-another and to the radiator, a gas burner in the base of said casing, and a pressure actuated gas controlling device in the gas line, said device comprising a chamber in the line the inlet and outlet openings being on a different level, a valve seat therein between said openings, a diaphragm located in said chamber above the valve seat and having a valve depending therefrom, and a vertically disposed tubular extension on said chamber above the diaphragm and extending up into the radiator, said extension being closed at its upper end.

4. The combination with plural vertically disposed radiator sections, of a like disposed and alining casing connected thereto, a primary generating chamber, a secondary generating coil and a dry-steam chamber arranged in said casing and connected to one-another and to the radiator, a gas burner in the base of said casing, and a pressure actuated gas controlling device in the gas line, said device comprising a chamber in the line the inlet and outlet openings thereof being on a different level, an adjustable valve seat therein between said openings, a diaphragm in said chamber above the valve seat and having a valve depending therefrom, and a vertically disposed tubular extension on said chamber above the diaphragm and extending up into the radiator.

In testimony whereof we affix our signatures in presence of two witnesses.

SAMUEL D. WOODS.
VICTOR W. SIPES.

Witnesses:

P. H. PENDLETON,
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