(No Model.) 2 Sheets—Sheet 1.

H. M. YOUNG.

PORTABLE RADIATOR.

No. 373,574. Patented Nov. 22, 1887.

FIG. 1.

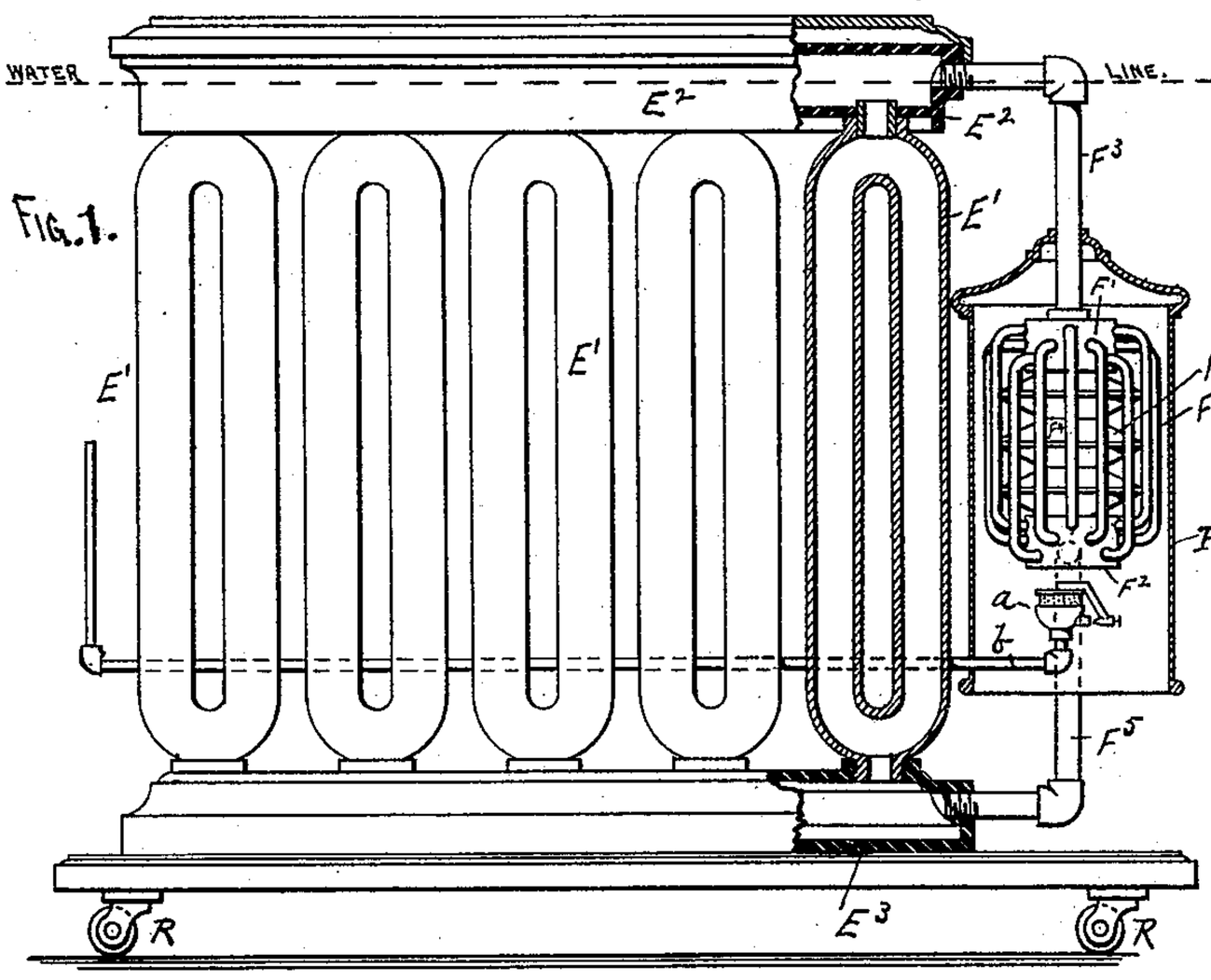
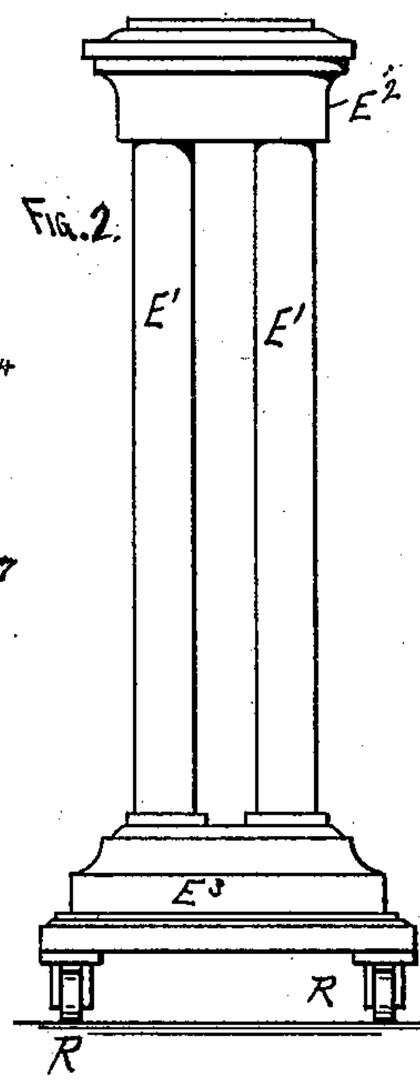


FIG. 2.



WITNESSES.
H. S. Webster.
A. H. Ockmann.

Henry Mason Young,
INVENTOR BY
Charles N. Woodward ATTY.

(No Model.) 2 Sheets—Sheet 2.

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PORTABLE RADIATOR.

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FIG. 3.

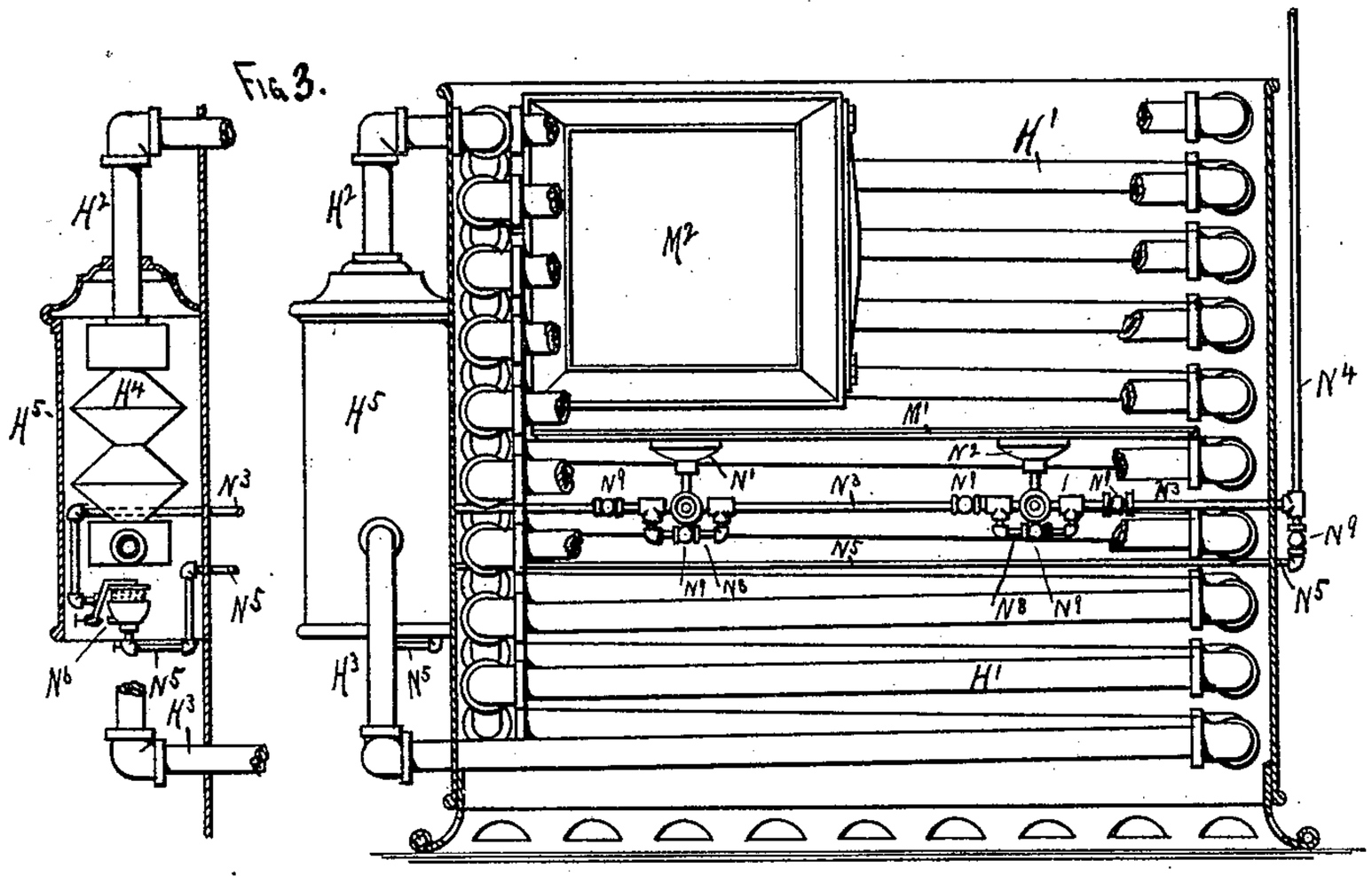
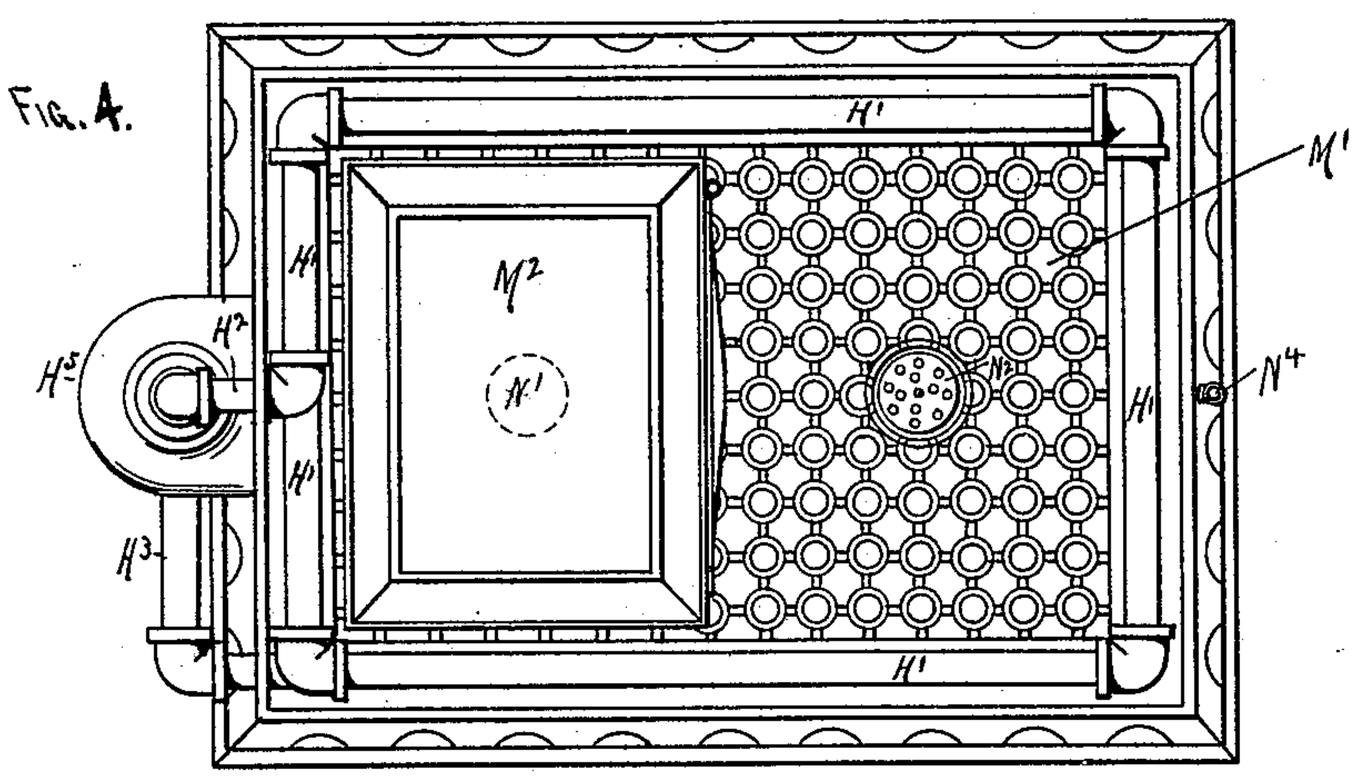


FIG. 4.



WITNESSES.
H. S. Webster.
A. H. Ackermann

Henry Mason Young.
INVENTOR BY
Charles N. Woodward, Atty.

UNITED STATES PATENT OFFICE.

HENRY MASON YOUNG, OF MINNEAPOLIS, MINNESOTA.

PORTABLE RADIATOR.

SPECIFICATION forming part of Letters Patent No. 373,574, dated November 22, 1887.

Application filed October 4, 1887. Serial No. 251,434. (No model.)

To all whom it may concern:

Be it known that I, HENRY MASON YOUNG, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Portable Radiators, of which the following is a specification.

This invention relates to heating and combined heating and cooking apparatus, which are constructed, arranged, and operated as hereinafter disclosed in the description, drawings, and claims.

The object of my invention is to provide an improved radiator for heating apartments, cooking, and other similar purposes, which is readily movable or portable, simple in construction, easily operated, not liable to get out of order, and cheaply manufactured.

In the drawings, Figure 1 represents a side elevation, partly in section, of an approved form of my water-heating apparatus; Fig. 2, an end elevation of the same, looking at the end opposite the generator; Fig. 3, a vertical section of the combined heating and cooking apparatus, showing some of the parts broken away and others in side elevation. Fig. 4 is a plan view of the same.

This invention is applicable to almost any form of heat-radiating and combined heating and cooking apparatus, in which hot water or steam is employed as the heating medium, and therefore, for the purpose of illustration, I have shown it applied to two forms of radiators.

In Figs. 1 and 2 I have shown a form of water heater or radiator consisting of two series of perpendicular double tubes, E', connected at their upper ends into one common "head" chamber, E^2, and at their lower ends into one common "bottom" chamber, E^3. At one end of the radiator is arranged a heater or generator consisting of two drums, F' F^2, into which pipes F^3 F^5 are connected, and which lead into and from the chambers E^2 E^3, as shown, the two drums being connected to each other by double conical drums F^4 and pipes F^6. This generator is inclosed in a casing, F^7. Arranged beneath the lower drum, F^2, is the burner *a*, which is connected by a pipe, *b*, to a suitably-arranged hydrocarbon-tank, whereby the necessary heat will be imparted to the generator.

As shown in Figs. 1 and 3, the generator and burner are arranged within the casing F^7, which is open interiorly from bottom to top, so as to afford free circulation of air within the same, and thus supply the necessary amount of air to the burner. This construction of the casing I regard of special importance, inasmuch as a more copious supply of fresh air is required for gas or hydrocarbon burners than for stoves or grates burning wood, coal, and similar fuel.

The generator and also the hydrocarbon-burner shown in Fig. 1 are made the subjects of separate applications for patents, filed simultaneously herewith and respectively serially numbered 251,436 and 251,433, and therefore I do not specifically claim them in the present application; but they are the ones I prefer to employ.

In Figs. 3 and 4 I have shown a rectangularly-arranged oppositely-inclined series of pipes, H', which are suitably connected by pipes H^2 H^3 with a generator, H^4, within a casing, H^5. The inclosed rectangular space within the circuit of the pipes H' is supplied with a perforated shelf or diaphragm, M', and beneath the same are arranged hydrocarbon-burners N' N^2, of ordinary or suitable construction for cooking purposes, the function of the perforated shelf being to support cooking-utensils.

M^2 represents a removable and portable oven, of the ordinary construction employed in connection with hydrocarbon-stoves, and it is adapted to be placed over either of the burners N' or N^2, as shown. The perforated shelf M' may be placed at any convenient point with relation to the pipes H', although preferably it will be placed within the circuit of said pipes about in the position shown. The burners N' N^2 are connected by piping N^3 to the burner N^6, and also to the main supply-piping N^4, which leads to a hydrocarbon-tank placed at any convenient point with relation to the pipes H', the tanks not being shown in this figure or the other figures of the drawings, as they form no necessary part of the invention, and their construction and arrangement are well known and understood. An additional pipe, M^5, leads from the main supply-pipe N^4 to the burner N^6, which is arranged beneath the generator H^4. This burner N^6 is constructed to vaporize the liq-

uid hydrocarbon before it comes in contact with the flame, and when employed in the connection shown in Fig. 4 its capacity will be sufficient to vaporize a sufficient quantity of the liquid hydrocarbon to not only supply the burners N′ N², but itself as well, for heating the generator H⁴. However, as before stated, I have filed an application for a separate patent upon the burner, and I do not claim it specifically in the present application. The piping N³ is supplied with by-pass pipes N⁸ at each of the burners N′ N², and also with stop-cocks N⁹, which are also applied to said by-pass pipes, by which said burners may be supplied with liquid hydrocarbon from the supply-tank or with vaporized hydrocarbon from the burner N⁶ beneath the generator, as desired. By this means one or more burners N′ N² may be operated independently of the others by vapor generated within itself, or by vapor supplied from the combined vaporizer and burner N⁶ beneath the generator H⁴, as desired.

By these simple forms or constructions of the invention the radiator and generator are self-contained or intimately connected, and effect an entirely continuous circulation of hot water or steam; also, they are movable from place to place or from room to room of the house, being either portable or movable upon the casters R upon the base of the radiator, as shown in Figs. 2 and 3.

Having thus described my invention, what I claim as new is—

1. A portable radiator constructed of a series of communicating pipes adapted to permit of a continuous circulation of hot water or steam therethrough, in combination with a generator connected with said radiator and constructed and arranged to produce said continuous circulation through said radiator and itself, a hydrocarbon-burner arranged beneath said generator, and a casing open from bottom to top and inclosing said generator and burner, substantially as and for the purpose described.

2. In a heating apparatus, the combination of the radiator provided with a series of pipes forming a continuous circuit for a heating agent, the generator, the hydrocarbon-burner arranged beneath said generator, the supply-pipe N⁴, the piping N³, the burners N′ N², connected to said piping, the stop-cocks N⁹, the pipe N⁵, and the burner N⁶, whereby either of said burners N′ N² may be operated independently of the other by vapor generated within itself or by vapor supplied from the combined vaporizer or burner N⁶, substantially as described.

3. In a heating apparatus, the combination of the supply-pipe N⁴, the piping N³, the burners N′ N², connected to said piping, the stop-cocks N⁹, the pipe N⁵, and the burner N⁶, whereby either of said burners N′ N² may be operated independently of the other by vapor generated within itself or by vapor supplied from the combined vaporizer or burner N⁶, substantially as described.

4. In a portable heating apparatus, the combination of a radiator provided with a series of pipes forming a continuous circuit for containing hot water or steam, a generator constructed and arranged to produce a continuous circulation through said radiator and itself, a shelf for supporting cooking-utensils within the circuit of said radiator, a hydrocarbon-burner arranged beneath said generator, and one or more of such burners beneath said shelf, said burners being arranged and constructed for joint or separate operation, substantially as and for the purpose set forth.

5. In a portable heating apparatus, the combination of a radiator provided with a series of pipes forming a continuous circuit for containing hot water or steam, a generator constructed and arranged to produce a continuous circulation through said radiator and itself, a shelf for supporting cooking-utensils within the circuit of said radiator, a hydrocarbon-burner arranged beneath said generator, and one or more of such burners beneath said shelf, the supply-pipe N⁴, the piping N³, having by-pass pipes N⁸ and cocks N⁹, and the pipe N⁵, leading to the burner, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY MASON YOUNG.

Witnesses:
C. N. WOODWARD,
H. S. WEBSTER.