

(No Model.)

2 Sheets—Sheet 1.

N. E. FROST.
HEATING APPARATUS.

No. 569,151.

Patented Oct. 6, 1896.

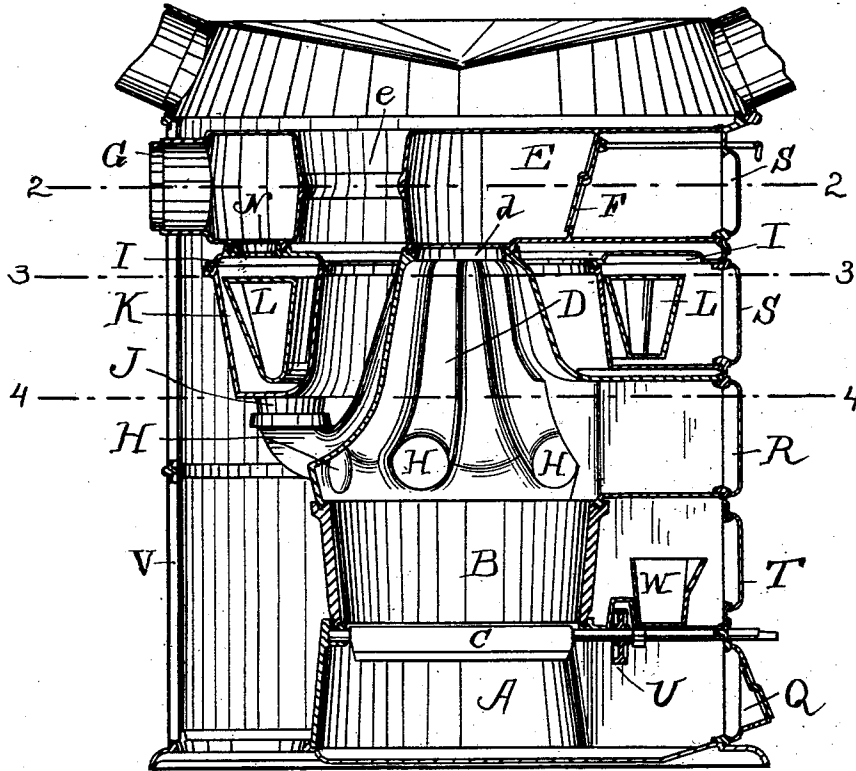


Fig. 1.

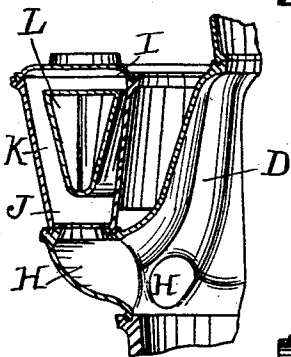
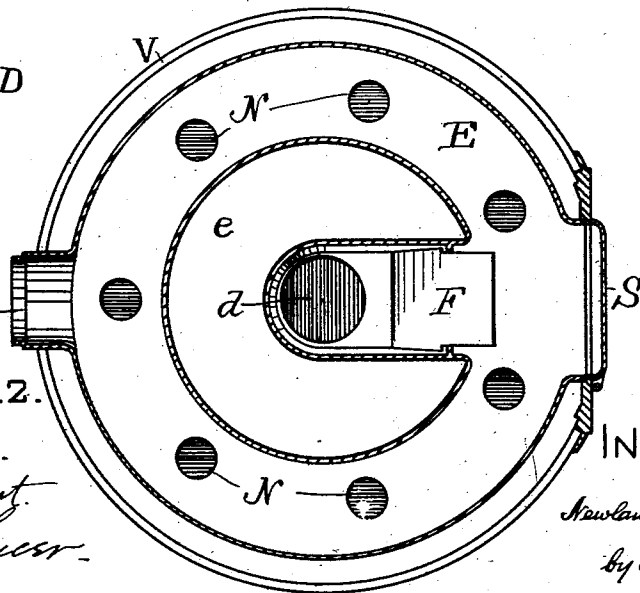


Fig. 5.

Fig. 2.

WITNESSES.

Matthew M. Blunt.
Ada H. Spencer.



INVENTOR,

Newland E. Frost,
by J. H. Pomeroy,

ATT'Y.

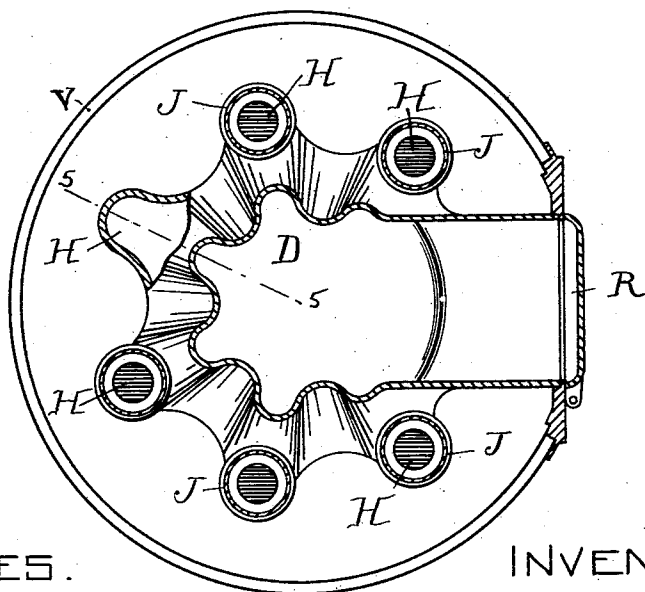
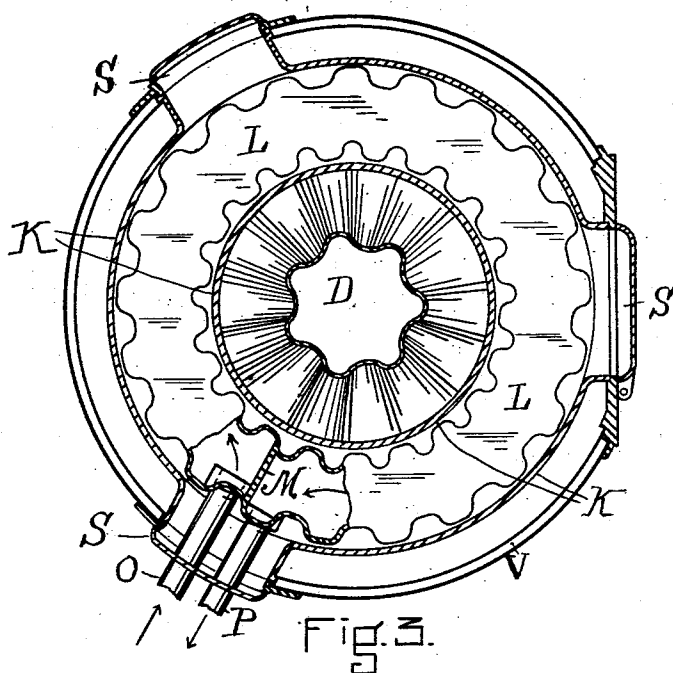
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2 Sheets—Sheet 2.

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HEATING APPARATUS.

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WITNESSES.

Matthew M. Blunt.
Eda H. Spencer.

INVENTOR.

Fig. 4.

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by A. H. Spencer,

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UNITED STATES PATENT OFFICE.

NEWLAND E. FROST, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO EMERSON
R. BISSELL, OF TYRONE, NEW YORK.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 569,151, dated October 6, 1896.

Application filed February 18, 1896. Serial No. 579,687. (No model.)

To all whom it may concern:

Be it known that I, NEWLAND E. FROST, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Heating Apparatus, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of my invention is to provide an improved hot-air and hot-water house-heater adapted to heat portions of a building by means of heated air conveyed in pipes, through registers, to certain rooms, and other portions by hot-water circulation from the furnace to radiators suitably located, the water returning thence to the furnace for repeated circulation. These two systems are combined in the apparatus herein shown and described. The furnace proper has a fire-pot crowned by a tapering corrugated dome with an opening through its top, controlled by a damper, and having at the base of its several corrugations flue-openings for the caloric current into an annular flame and smoke space about midway between the dome and the outer wall or jacket. The water-heating device is a laterally-corrugated water-conducting ring, located within said smoke and flame space, being thus subjected to the heating action of the caloric current therein. Above the water-ring and its casing is the radiator or smoke-drum, of annular form, and connected to the casing (which incloses the water-ring) by a series of openings or very short vertical pipes, through which the caloric current passes on its way to the funnel. The water-ring has a transverse partition between its inlet and outlet pipes, so that the water must pass entirely around said ring, impinging as it goes against the corrugated walls, and being thoroughly heated. An outer jacket or wall surrounds the heater. Cold air rising from the bottom comes in contact with the fire-pot wall and dome and passes each side of the water-ring casing and the radiator, and from the top is distributed, through pipes, to the several rooms.

In the drawings, Figure 1 is a vertical central section through my improved heater. Figs. 2, 3, and 4 are horizontal sections taken, respectively, on lines 2, 3, and 4 of Fig. 1; and

Fig. 5 is a detail vertical section in the plane of line 5 5 of Fig. 4.

A is the base-section or ash-pit, B the fire-pot, and C the grate.

D is the tapering corrugated dome crowning the fire-pot and open at the top into a lateral passage leading into the smoke drum or radiator E and controlled by a damper F. (See Figs. 1 and 2.) Through this open top and direct passage the volatile products of combustion enter said drum and pass in either or both directions to the funnel G when the damper is open, as in Fig. 2.

At the base of the dome I form a series of short, hollow, upturned, radial arms H, serving as indirect or lateral flue openings, (see Figs. 1, 4, and 5,) each formed on and leading from the enlarged foot of one of the deep corrugations of the dome. Through a short neck J, Figs. 1 and 5, each arm or flue-opening H communicates with a flame-chamber or annular casing K, surrounding the upper portion of the dome and inclosing the water-ring L. This ring is shown in Figs. 1 and 5 as tapering downwardly and in Fig. 3 as having corrugated or sinuous side walls, a transverse partition M, and flow and return pipes O P for continuous water circulation to and from radiators in rooms to be heated by hot water. Suitable supports will hold the ring L above the bottom of its casing K. A series of flues N open communication between the casing K and the drum or radiator E above it.

The casing K tapers downwardly and has the series of necks J formed in its bottom. Its covering is an iron plate I, having the series of flues N opening through it, preferably at points about midway between the planes of the necks J. The caloric current has thus an indirect course through this series of passages and the casing K, impinging on the water-ring L, and effectually heating its contents. The rising air-current is heated by contact with the fire-pot wall and dome and with the surfaces of the outer and inner walls and of the top and bottom of the casing K and drum or radiators E. The air passes upwardly through the radiator, as shown at e, Figs. 1 and 2.

Q, Fig. 1, is the ash-door, R the fuel-feed door, and S S clearing-out doors, giving ac-

cess to the interior. A door T, Fig. 1, permits the introduction and filling of a water-pan W. Gears U or linked arms connect the prolonged stems of the grate-bars C for simultaneous tilting.

The outer jacket V is represented as hollow or having an air-space between the outer and inner sheet-metal shell with proper vent. If preferred, this space may be packed with mineral wool or any suitable non-conductor of heat.

I claim as my invention—

1. In a heating apparatus, the fire-pot dome open at its top, the annular smoke-drum above said dome and communicating therewith through a dampered passage, and a series of upturned, radial, hollow arms leading from the base of said dome, in combination with an annular casing interposed between said drum and arms and communicating with each, and a water-ring inclosed within said casing, substantially as set forth.

2. In a heating apparatus, the fire-pot dome formed with deep vertical corrugations, short, radial, hollow arms opening from the enlarged base of each corrugation, and a water-ring surrounding the tapering upper portion of said dome, in combination with a casing inclosing said ring and constituting a flame and smoke space with which said arms communicate, and a smoke-drum above said casing

and communicating therewith, substantially as set forth.

3. In a heating apparatus the dome D opening at top into the smoke-drum E and having short, hollow, upturned arms H, leading from its base, in combination with a water-ring surrounding the dome and with its casing K having in its bottom necks J connecting with said arms, and provided with a covering-plate I having flue-openings N communicating with the drum E, substantially as set forth.

4. In a heating apparatus, the fire-pot B having a tapering dome D, open at its top, and a lateral passage leading therefrom, the annular smoke-drum E extending each way from said passage to the funnel, and the hollow arms H leading from the base of the dome, in combination with the transversely-partitioned water-ring L having corrugated side walls, the inlet and outlet pipes O P for continuous water circulation, and the casing or flame-space K surrounding said ring, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

NEWLAND E. FROST.

Witnesses:

J. W. FRYER,
F. W. WRIGHT.