(No Model.)

# N. E. FROST.

## HEATING APPARATUS.

No. 557,528. Patented Mar. 31, 1896.

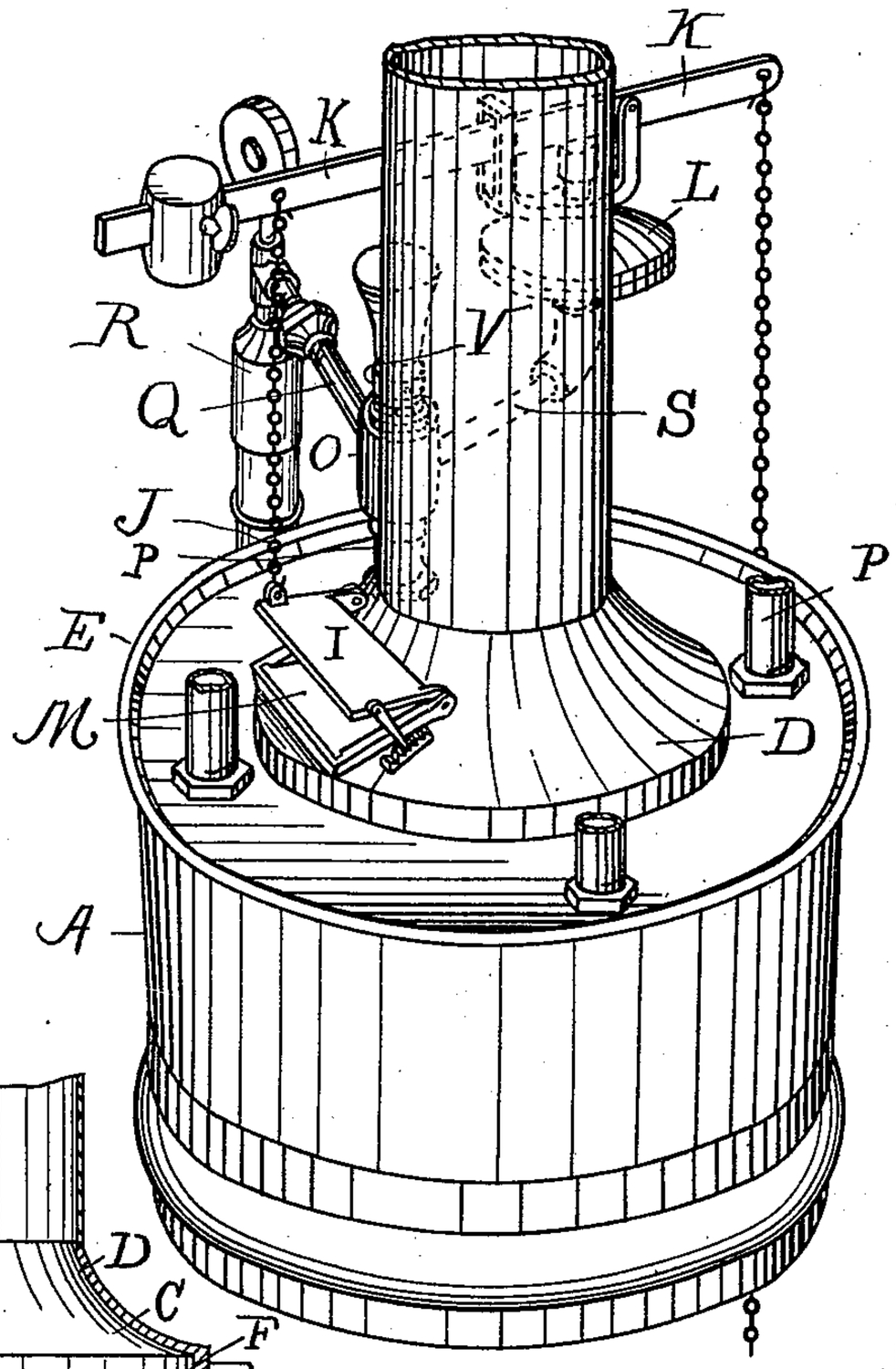


Fig. 1.

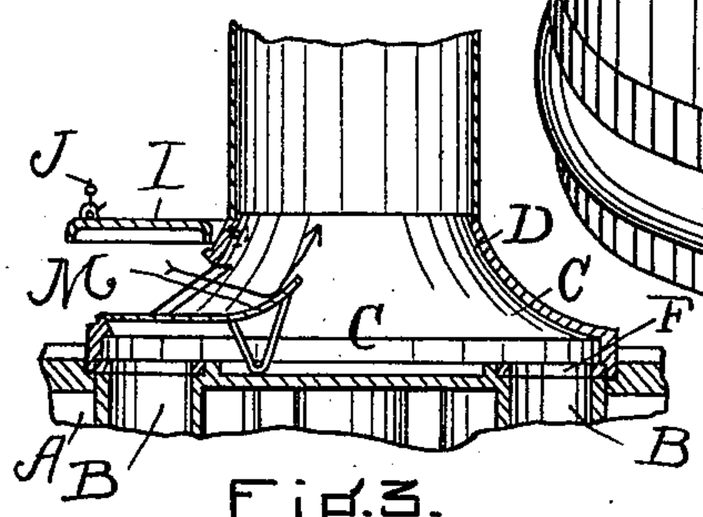


Fig. 3.

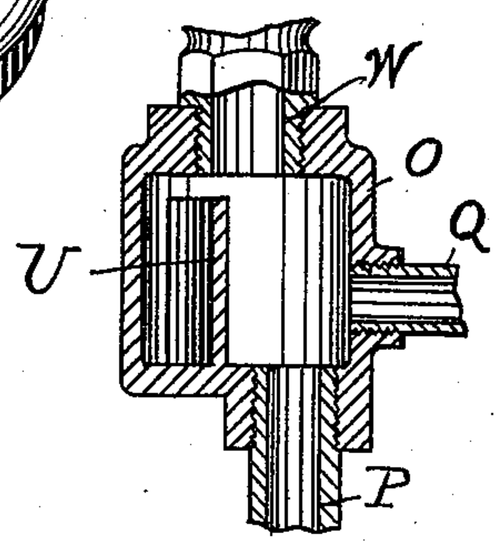


Fig. 4.

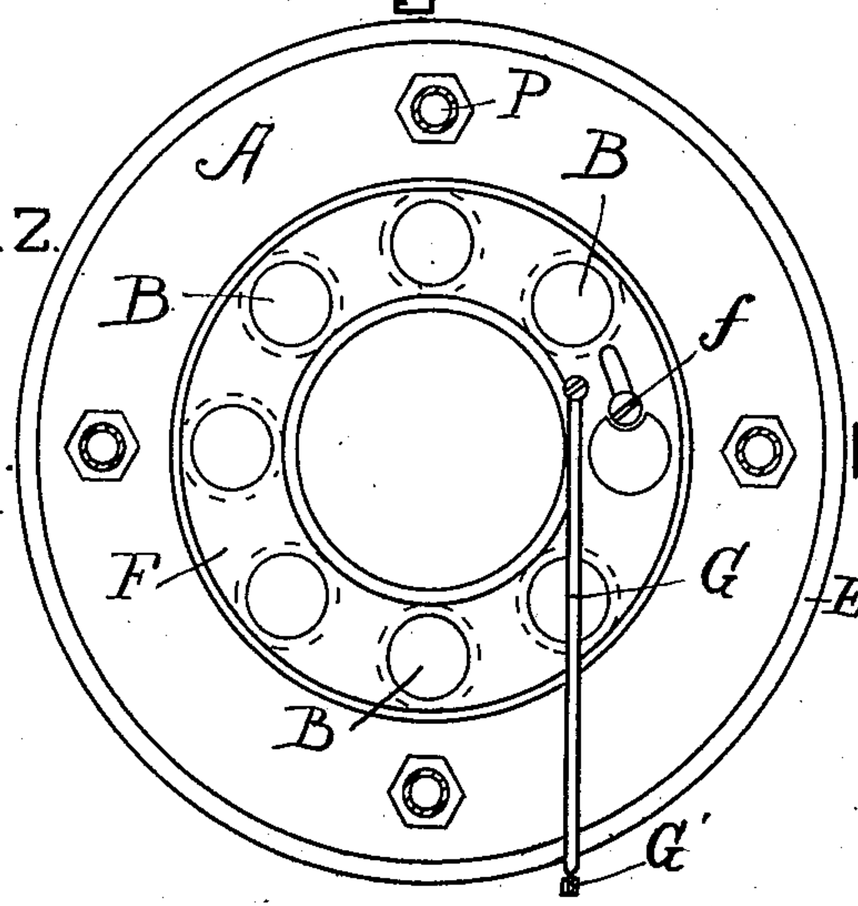


Fig. 2.

WITNESSES.
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# UNITED STATES PATENT OFFICE.

NEWLAND E. FROST, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SMITH & THAYER COMPANY, OF MAINE.

## HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 557,528, dated March 31, 1896.

Application filed September 20, 1895. Serial No. 563,075. (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.

My present invention relates to house-heating apparatus of the class known as "steam" or "hot-water" heaters, and more especially to improvements in the upper part of such heaters and connected with the hot-water drum or steam-dome. The draft is controlled by devices not herein claimed, one feature being a partially-rotating annular damper resting on the top plate of the dome or drum and having apertures corresponding in number and coinciding with the circular flues which rise through said dome or drum, such damper being operated by a rod extending horizontally from it through the cap and over the marginal flange. The draft is further controlled by an air-inlet, through the tapering cap of the heater, which may be opened by the attendant to the extent desired and so held mechanically or opened automatically when the heat becomes excessive. A peculiarly-arranged deflector directs the air entering through the inlet to the funnel and prevents it from chilling the steam in the dome. This deflector may be removed when access to the interior is desired through said inlet to remove soot or ashes from the top of the dome. The steam and water gages are connected, as usual, through the top and side of the dome with the steam and water spaces therein, and the usual diaphragm and lever with chain extending down to the draft-door are provided for the automatic regulation of the draft. Between the diaphragm and said gage a hollow shell is located upon the steam-pipe leading from the dome to the safety-valve, and in this shell I erect a vertical partition, forming a water-trap, which prevents drawing the water from beneath the diaphragm when the steam is blown off in testing the safety-valve.

In the drawings, Figure 1 is a view of the top of my improved heater, showing the arrangement and connection of the several parts. Fig. 2 is a top view or plan of the damper and connected parts. Fig. 3 is a vertical section showing the position of the deflector. Fig. 4 is an enlarged section of the hollow shell or trap.

A represents the steam-dome of the heater, having a series of vertical flues B extending through it for the passage of smoke upwardly into the top chamber C, comprising the space between the upper surface of the steam-dome and the tapering cap D, which leads to the funnel.

E is a flaring rim or marginal flange, forming an edge finish at the upper corner of the dome or drum A.

F is the damper, a flat plate or ring, partially rotatable on the dome-top and formed with a series of apertures corresponding to the flues B and with adjacent unperforated parts, serving to close the flues when the damper is turned for that purpose. When it is partly turned, the current through the flues is correspondingly checked. A suitable stop is formed by a pin *f*, extending through a slot in the damper to limit its movement. (See Fig. 2.)

G is the operating-rod extending horizontally outward through the side of the cap from a lug on the damper to which it is loosely connected, and outside of the cap this rod extends over the flange as a support and is furnished with a knob or pendent handle G'. I, however, make no claim to the damper mechanism.

The air-inlet I is a horizontally-hinged door opening through the tapering cap D and furnished either with a ratchet and pawl or like mechanical device for holding it open to the extent desired, which is the preferred form for hot-water heaters; or, as shown in Fig. 1, a chain J extends from said door to a pivoted lever K, automatically raised by excess of steam-pressure upon the water beneath the yielding diaphragm inclosed in the regulator-chamber L, as will be understood.

M represents a sheet-metal deflector, which may be introduced within the tapering cap D and supported at the inlet-opening to direct the air-current to the funnel and prevent its immediate impingement upon the steam-drum A. The inner end of the de-

flector turns upwardly and the device will be suitably supported, so as to be readily removable when desired, to give opportunity to clean off the top of the drum.

O represents a hollow shell mounted upon a steam-pipe P, rising from the top of the drum A beside the cap D. From this shell a steam-pipe Q of reduced diameter leads laterally to the steam-gage R, while a similar pipe S leads from the opposite side of the shell to the diaphragm-chamber L of the automatic draft-regulator apparatus. Near that side of the shell O from which the pipe S extends I erect a vertical partition U, reaching nearly to the top of the closed shell O and forming a trap to retain water in the pipe S and in the part of the shell adjacent thereto, notwithstanding that a current of steam under pressure is rising on the other side of said partition through said shell whenever the safety-valve V above such shell is tested. This improved trap then prevents the water beneath the diaphragm from being blown out through the safety-valve, although it is exposed, in said shell, to the pressure of the steam upon its surface.

I claim as my invention—

1. In a heating apparatus, the dome or drum A provided with flues B, the cap D resting thereon and inclosing a smoke-space into which said flues lead, in combination with the removable deflector M, adjacent to the air-inlet through said cap and serving to deflect the air-current to the funnel, substantially as set forth.

2. In a heating apparatus, the steam-dome A with suitable automatic draft-regulating apparatus supported thereon, in combination with the hollow shell O mounted on pipe P and provided with the vertical partition U dividing said shell into two compartments, the pipe S leading laterally from one compartment to the diaphragm-chamber L, the pipe Q leading from the other compartment to the steam-gage R, and the pipe W leading to the safety-valve V, said pipes, P, Q and W, all entering the same compartment, 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:

G. S. KING,

H. MELLEFONTE.