

(No Model.)

N. E. FROST.
HEATING APPARATUS.

No. 546,971.

Patented Sept. 24, 1895.

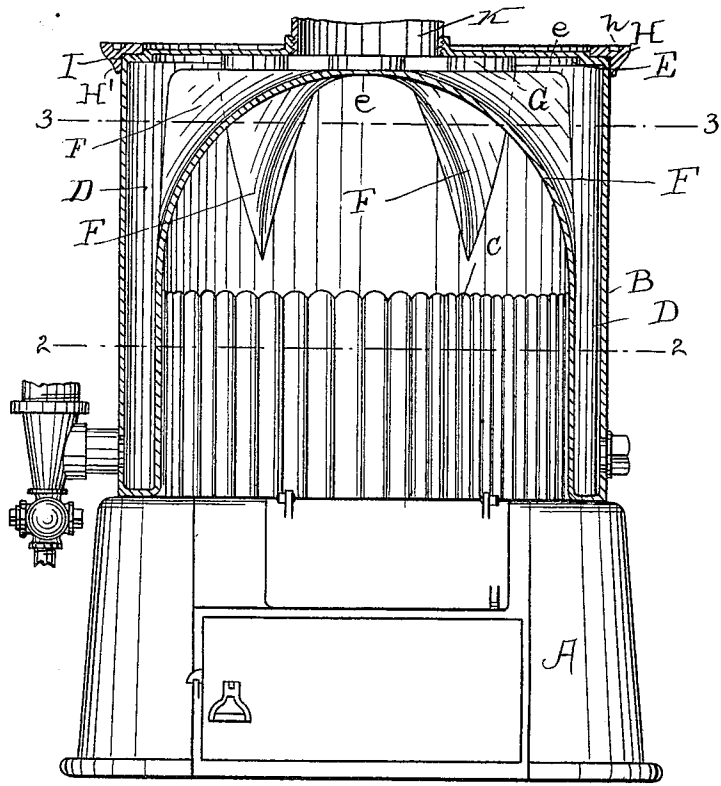


Fig. 1.

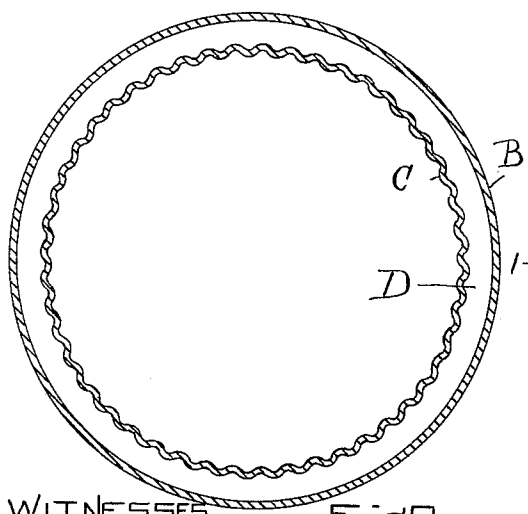


Fig. 2.

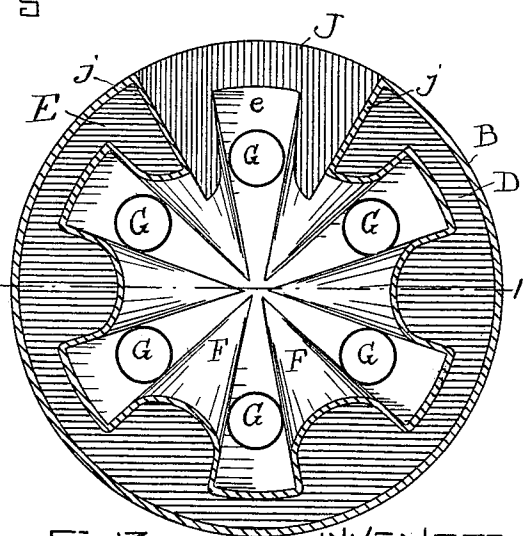


Fig. 3.

WITNESSES.
Matthew M. Blunt.
h. J. Crawford.

INVENTOR.
Newland B. Frost
by A. H. Jones.
ATT'Y.

UNITED STATES PATENT OFFICE.

NEWLAND E. FROST, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO EDWARD R. PIERCE AND WILLIAM H. THAYER, OF SAME PLACE.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 546,971, dated September 24, 1895.

Application filed June 3, 1895. Serial No. 551,518. (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 invention relates to the fire-pot of a heating apparatus, especially to such furnaces as are designed for house-heating, either by steam or hot-water circulation.

My improvement is embodied in a fire-pot formed with a hollow peripheral wall adapted to contain water to be heated or converted into steam, the lower portion of the inner wall being corrugated vertically about to the level of the fuel-door and the upper portion or dome of the fire-pot being formed with hollow water-containing ribs, arching inwardly to or toward the center and projecting well into the narrowing flame space of the dome, so as to expose the water in them transversely to the heat, while the caloric current passes upwardly through flue-openings in the dome-top between these hollow ribs. The fuel-opening into the fire-pot is flanked on either side by the converging walls of adjacent ribs. The top of the fire-pot is also hollow, containing water, in direct communication with that in the side walls and hollow ribs. A threaded central opening enables the superposed water-sections (not herein shown) to be screwed to the integral fire-pot top. A water-inlet is provided at one side of the annular fire-pot near its lower edge, and at a point nearly opposite there is a connection and cock to permit drawing off the water when the hollow interior is to be cleaned out. An annular offset or recess is formed at the junction of the top and outer wall to receive an annular casting grooved in its upper surface, within which groove the flange of the first water-section rests.

In the drawings, Figure 1 is a vertical central section through my improved fire-pot, shown as mounted on a suitable base, seen in elevation. Figs. 2 and 3 are horizontal sections, taken, respectively, on the lines 2-2 and 3-3 of Fig. 1, looking down in Fig. 2 and up in Fig. 3.

A represents the base of the heater, of any ordinary construction, and having a suitable grate within its upper part.

B is the cylindrical outer wall of the fire-pot, and C its vertically-corrugated inner wall, between which is the annular water-space D, surrounding the fire. These walls are cast in one with the hollow top E and ribs F, and the entire fire-pot is integral, being cored in casting so as to have one continuous water-space within it for the free circulation and rapid heating of the water inclosed. The hollow sides and top of the fire-pot meet internally in a curve, forming a flattened dome. The hollow ribs F spring from the upper half of the inner wall C and curve upwardly and inwardly to meet and become merged in the under side or plate *e* of the hollow top. These ribs project bodily into the flame-space of the fire-dome and reach nearly to the center of the plate *e*, giving the effect of arches and enabling the heat to act powerfully upon the water therein as the caloric current moves to and escapes through the flue-openings G, which extend through the top between the ribs. The side walls of the ribs converge and meet in a curve or angle, about as indicated in Fig. 3.

In operation the heated water ascends from the annular lateral water-space through the ribs or arches F and hollow top E, passing out through the threaded central opening K to the upper water-sections. (Not shown.)

At the extreme top of the fire-pot there is formed an annular recess or offset I, around the outer angle where the top plate meets the side wall B. This recess receives an annular casting H, formed with a shoulder which fits therein, a depending flange H' fitting the wall B below said recess, and an annular groove *h* in its upper surface to receive the lower flange of the superposed water-sections. The groove *h* is a circle of somewhat greater diameter than the fire-pot wall B, so that the water-sections fitting therein may slightly overhang said wall and be supported outside of it. The casting H H' *h* acts, therefore, as a saddle-piece interposed between the hollow-walled fire-pot and the superposed body of the heater, and it serves to make a symmetrical joint or union of said parts and lessens the difficulty in casting them.

The fuel-door J opens into the fire-pot above the top of the vertical corrugations. At each side of the opening the side wall *j* of one of the hollow ribs is seen, such walls converging toward the central part of the heater. In order to give abundant room for introducing the fuel, the ribs which immediately adjoin the fuel-opening may be placed somewhat farther apart than are the others; but I prefer rather to reduce their breadth, making them about half as wide as the others, and forming the walls *j* about vertical instead of inclined from the apex or inner angle of the ribs. (See Fig. 3.)

I claim as my invention—

1. The improved fire-pot described, consisting of the annular water-containing wall and hollow top cast integral with the hollow water-containing ribs formed in the inner shell and arching inwardly and converging to a common center over the fire-chamber, and with vertical flue-openings between said ribs, substantially as set forth.

2. The improved fire-pot described, comprising the cylindrical outer wall B, the inner wall C vertically corrugated in its lower portion, the hollow top formed of upper and lower plates joined respectively to said walls, the inwardly curved hollow ribs F having sides springing from the wall C and top *e* and converging to a common center over the fire-chamber, forming with said hollow side walls and top a continuous water-space surround-

ing the fire-chamber and the flue-openings G, substantially as set forth.

3. The improved fire-pot described, consisting of an outer and inner shell cast integral, forming an inclosed annular water-chamber in the side walls and a water space in the top continuous therewith, and hollow ribs or arches formed in the inner shell and opening into and connecting said lateral and upper water spaces, said arches projecting into and converging to a center over the fire chamber, with a central water passage leading from the upper water space through the outer shell to the upper portion of the boiler, and with vertical flue-openings through the double top between said arches, substantially as set forth.

4. The integral fire-pot described, having sides and top cast hollow, and hollow inwardly curved ribs F connected thereto, the upper, outermost corner of said fire-pot, having an annular recess I in combination with the annular saddle-piece H H' fitting within said recess and along the adjacent exterior of the wall B and provided with the groove *h* in its upper surface, 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:

RALPH B. CARTER,
JAS. L. MAULL, Jr.