(No Model.) 2 Sheets—Sheet 1.

R. BOTTSFORD.

HEATING APPARATUS.

No. 419,817. Patented Jan. 21, 1890.

Fig. 1.

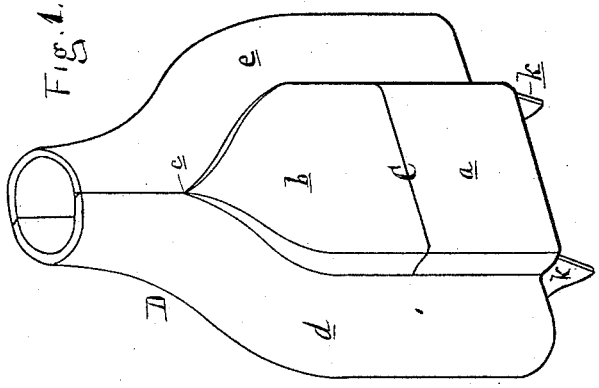
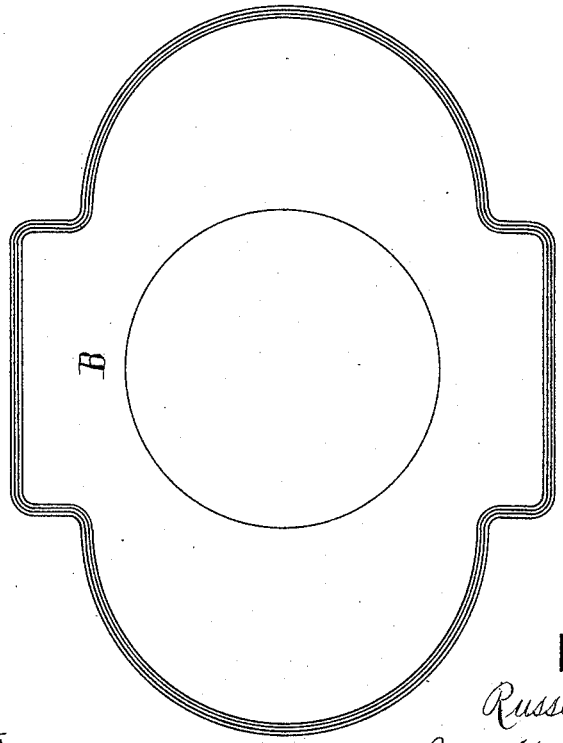


Fig. 4



ATTEST

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By N. S. Sprague

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(No Model.) 2 Sheets—Sheet 2.

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HEATING APPARATUS.

No. 419,817. Patented Jan. 21, 1890.

Fig. 3.

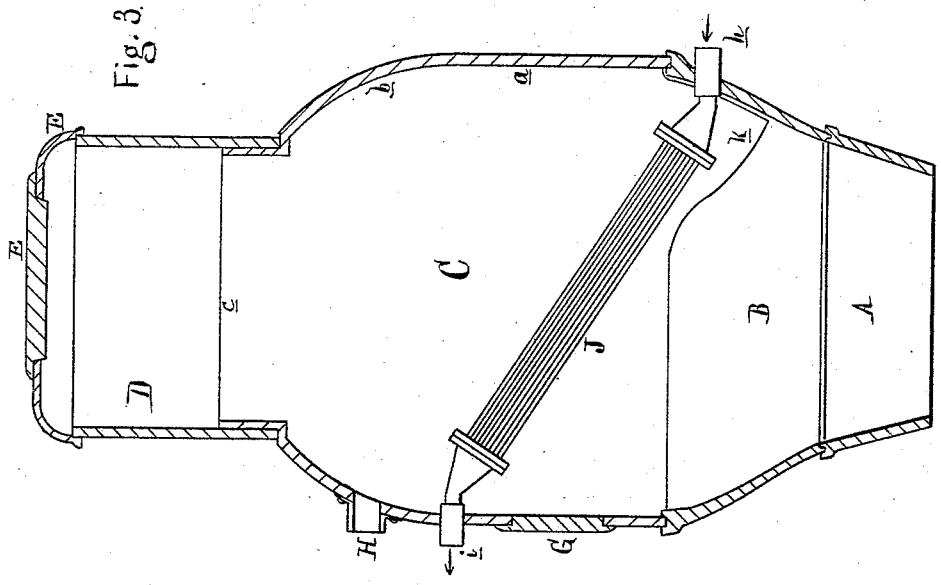
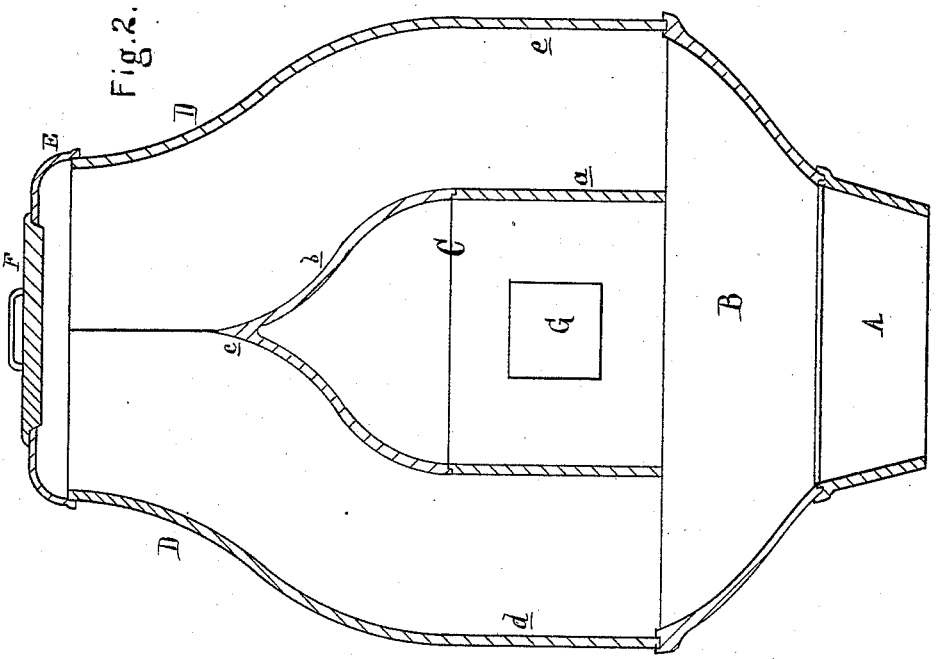


Fig. 2.



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J. H. Stephan.

INVENTOR

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By N. S. Sprague
Atty.

UNITED STATES PATENT OFFICE.

RUSSELL BOTTSFORD, OF CLEVELAND, OHIO.

HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 419,817, dated January 21, 1890.

Application filed August 3, 1889. Serial No. 319,619. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL BOTTSFORD, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Heating Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in the construction of heating apparatus, and is especially designed for use in hot-water-circulating systems wherein the water to be heated is brought into close proximity to the heating agent through the medium of a manifold consisting of a plurality of tubes.

The invention consists in the peculiar construction of the heater, furnace, or stove, and in the combination therewith of a multiple manifold, all as more fully hereinafter described and claimed.

Figure 1 is a perspective view of the body of my improved heater with the fire-pot section and the top section removed. Fig. 2 is a vertical central section of the heater complete. Fig. 3 is a similar view at right angles to Fig. 2, and also showing position of the manifold. Fig. 4 is a top plan of the fire-pot section.

In the accompanying drawings, which form a part of this specification, A represents the grate-section, which is preferably circular in form. Upon this grate-section is mounted the fire-pot section B, a proper joint being formed between the two parts. This fire-pot section is formed flaring, as shown, being semicircular upon its ends at the upper portion and straight at the sides, the sides and ends being joined by round corners, as shown.

C represents the combustion-chamber section, and it is formed in two parts *a b*, the lower part *a* being substantially rectangular in cross-section and rests upon the top of the fire-pot section, leaving the two semicircular ends thereof exposed, Figs. 2 and 3. The part *b* or top section of the combustion-chamber rests upon the top of the section *a*, but gradually narrows to a central point *c* in its longitudinal direction, thus forming a combustion-chamber with a closed top.

D represents an outer casing, which is formed in two halves *d e*, semicircular in cross-section, and which rest upon the tops of the similarly-formed ends of the fire-pot section, embracing the combustion-chamber upon its longest sides and uniting at the top, forming a magazine-section, which is provided with a top E and a feed-door F.

G is a door in one of the exposed ends of the combustion-chamber, and H is the smoke-exit above it, as shown.

J is a manifold placed in an inclined position in the combustion-chamber, with the inlet at *h* and the outlet at *i*, and at which points the manifold is designed to be connected with a system of hot-water-circulating pipes.

The parts being constructed and arranged substantially as herein described, fire is made in the fire-pot. Fuel, being put into the top of the magazine-section, is fed to the fire down upon two sides of the combustion-chamber, and as the manifold is designed to take up the greater portion of the space in cross-section of the combustion-chamber the heat and products of combustion must necessarily pass up between and envelop the pipes of the manifold before they can pass to the exit at H, and it therefore follows that the water contained in the tubes of the manifold must be heated to a high temperature, and in its expansion it passes out of the manifold at the top and is replaced by cooler water flowing in at the bottom.

To prevent fuel feeding to the fire-pot at the lower end of the manifold, the lower section *a* of the combustion-chamber is provided with the downwardly-projecting wings *k*, which partially shut off the feed at that point and precludes the possibility of overheating or burning the manifold at that point.

What I claim as my invention is—

1. A heating-furnace for the purpose described, comprising a combustion-chamber with a closed top and a magazine-section partially inclosing the said combustion-chamber and feeding fuel down upon two sides thereof, substantially as specified.

2. A heating furnace or stove consisting of a grate-section, a fire-pot section, and a combustion-chamber partially inclosed with a magazine-section, in combination with a mani-

fold consisting of a plurality of water-conducting tubes communicating with a head at either end common to all said tubes, the parts being constructed, arranged, and operating substantially in the manner and for the purposes set forth.

In testimony whereof I affix my signature, in presence of two witnesses, this 29th day of July, 1889.

RUSSELL BOTTSFORD.

Witnesses:
H. S. SPRAGUE,
O. L. BAKER.