J. REYNOLDS.

HEATER.

No. 176,416. Patented April 18, 1876.

Fig. 1

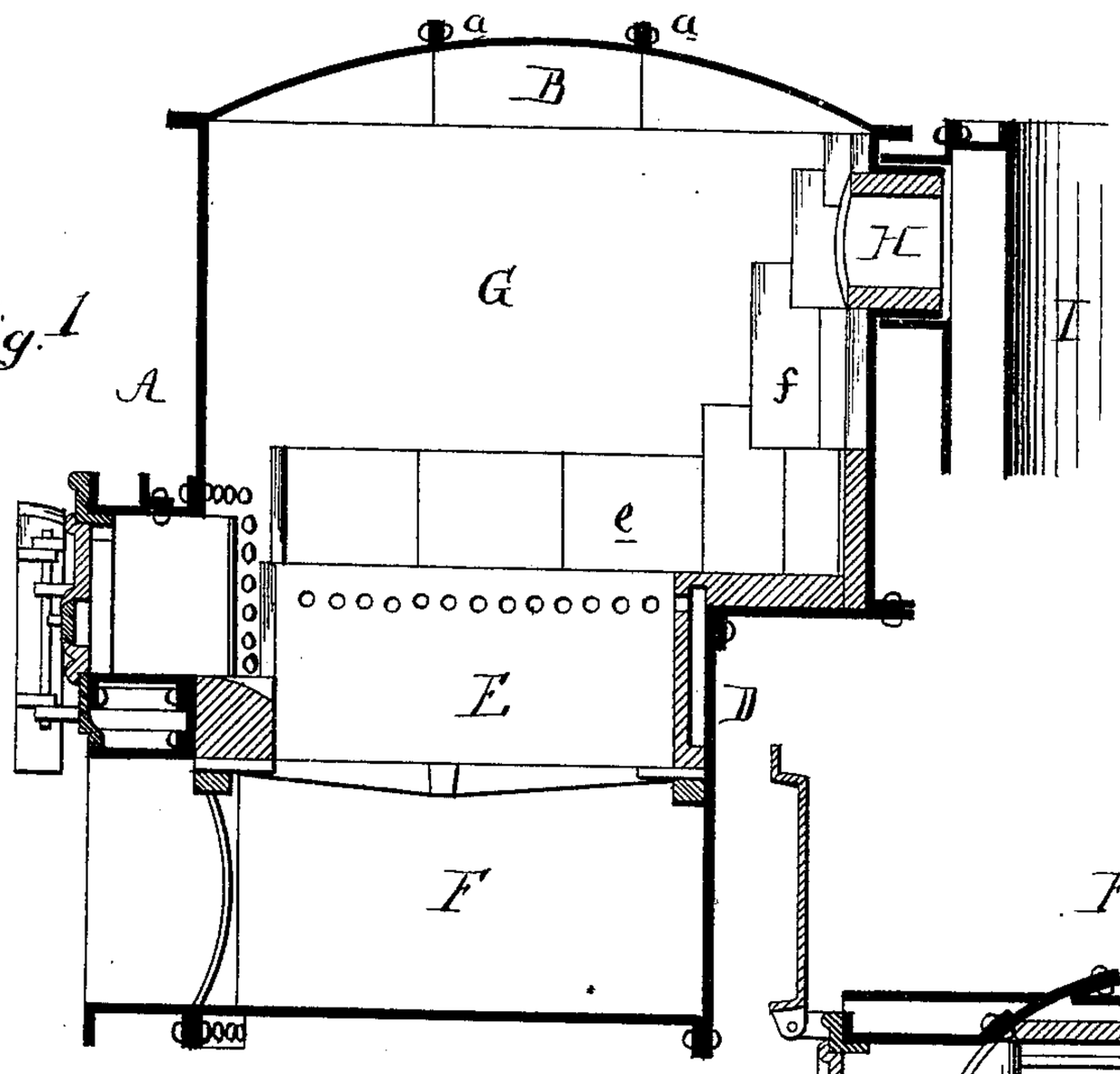


Fig. 2

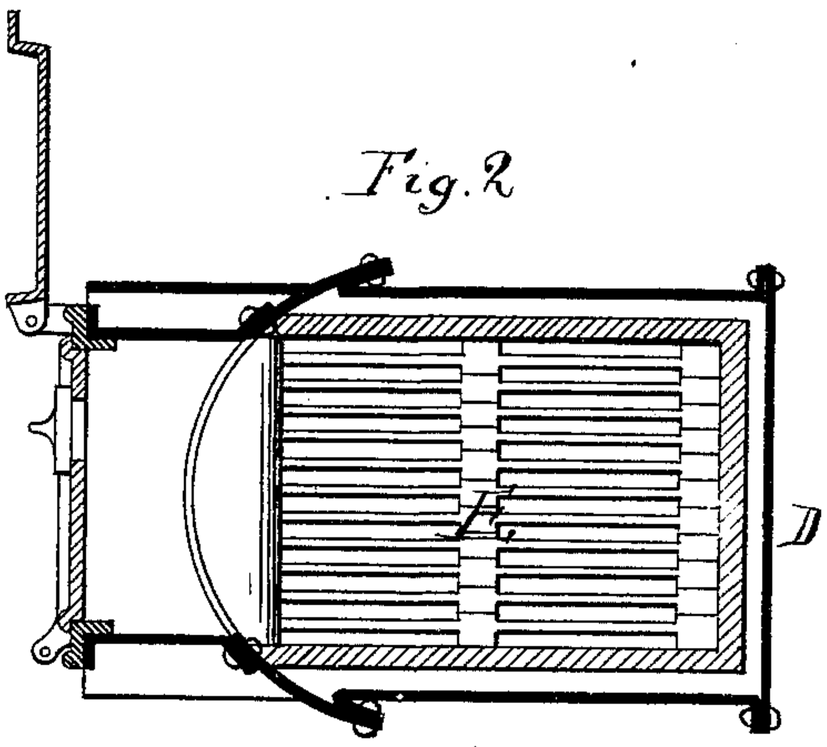


Fig. 3.

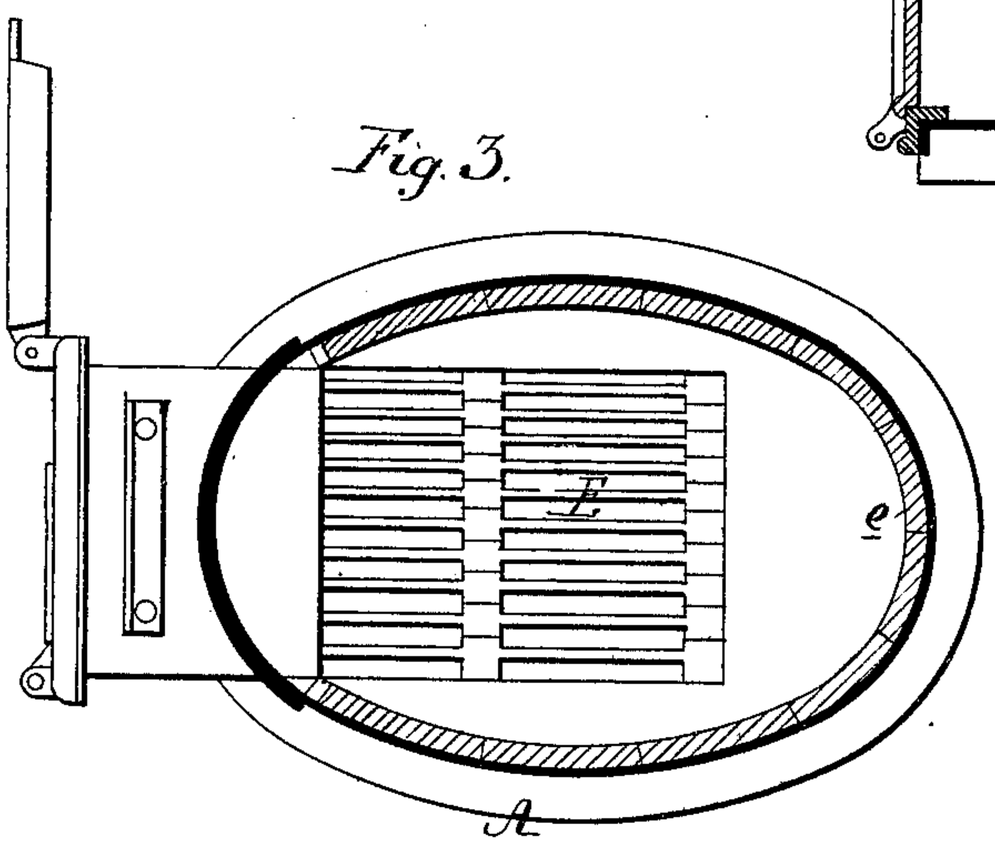
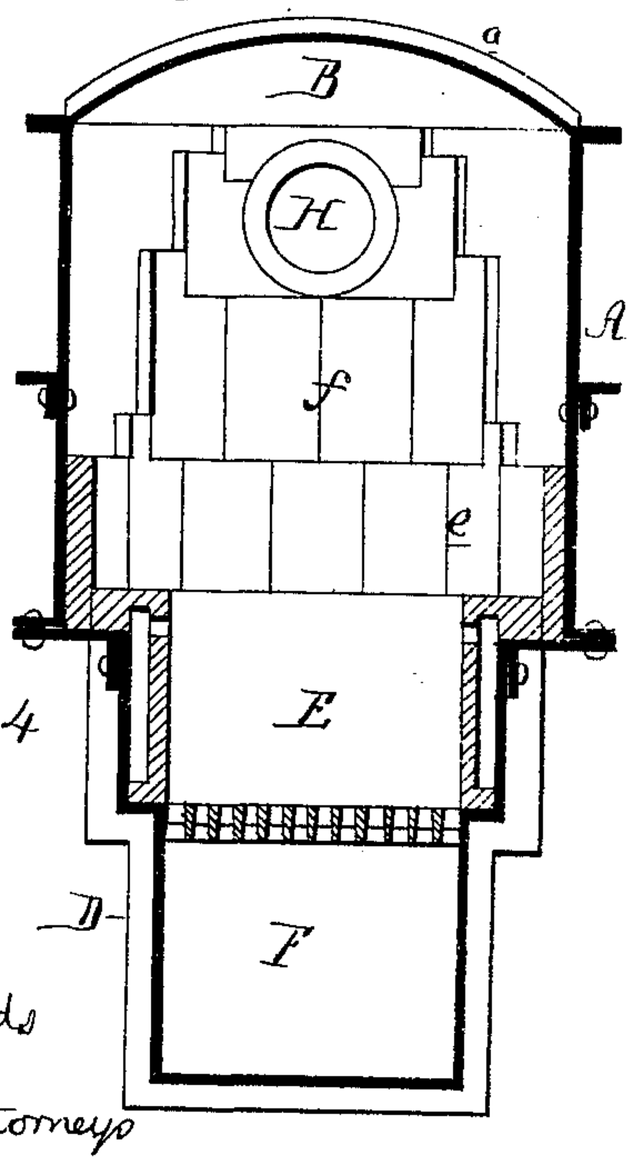


Fig. 4



WITNESSES:
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UNITED STATES PATENT OFFICE.

JESSE REYNOLDS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN HEATERS.

Specification forming part of Letters Patent No. **176,416**, dated April 18, 1876; application filed April 9, 1874.

To all whom it may concern:

Be it known that I, JESSE REYNOLDS, of Philadelphia, Pennsylvania, have invented certain Improvements in Heaters, of which the following is a specification:

The object of my invention is to construct a heater in which to burn soft or bituminous coal with the best results, an object which I attain in the manner illustrated in the vertical section Figure 1 of the accompanying drawing, and in the sectional plans Figs. 2 and 3, and transverse vertical section, Fig. 4.

The outer casing A, composing the main body of the heater, is of the oval sectional form shown in Fig. 3. This casing A is made of sheet-iron plates, and is surmounted with a cover, B, of the concavo-convex form, represented in Figs. 1 and 4.

The cover is made of any appropriate number of sheet-iron plates—three in the present instance—the edges of the adjoining plates being flanged, and these flanges being riveted together, thus forming permanent girders, which serve to strengthen the cover, the latter, as thus constructed, being an especial feature of my invention.

The heat generated by a soft-coal fire is intense, and an ordinary flat top of a heater, if made of reasonable thickness, could not retain its shape when subjected to this heat; but comparatively thin plates may be used in constructing the concavo-convex cover, providing it is strengthened by the riveted flanges *a a*, in the manner illustrated and described.

Below the main body A of the heater is the casing D, containing the fire-place E and ash-box F, the fire-place being of the oblong form represented in the sectional plan, Fig. 3, and situated near the front of the oval casing A, inclosing the combustion-chamber G, the outlet H from which is situated at the rear of the casing near the roof.

After many practical tests I have ascertained that this combination of oblong fire-place, oval combustion-chamber, and outlet, situated in respect to each other, as shown, is the best for effecting a thorough combustion of the soft coal, and for imparting to the casing A the greatest heat.

Another advantage of the oval casing is the facility and economy with which it can be made of comparatively light material, for it has sufficient inherent strength to retain its shape in the absence of corner angle-irons.

As the rear of the combustion-chamber is subjected to intense heat, I line it with refractory tiles in the manner illustrated in Fig. 4. The tiles *e* are carried upward against the interior of the casing A, a short distance above and on each side of the fire-place, and these tiles meet the rear tiles *f*, which are made to conform to the shape of the casing, and are carried upward in steps to the roof, the upper tiles fitting into recesses in those below, so that the whole may be retained in their proper positions.

Owing to the concentration of the ignited products of combustion at the outlet H, which forms the commnication between the combustion-chamber and the radiator I, part of which is shown in Fig. 1, this outlet-branch is subjected to intense heat; hence I line the metal tube with a short pipe of fire-clay or other refractory material.

The grate, doorway for the introduction of the fuel, doors, ash-pit, and opening through which air for supporting combustion is admitted, are of the ordinary character, and will require no explanation.

I do not claim, broadly, the protection of the casing of the combustion-chamber with tiles or fire-brick, as this forms the subject of a separate application which I am about to make for a patent.

I claim as my invention—

1. The combination, in a heater, of an oval combustion-chamber, G, a fire-place, E, communicating with the lower part of the said chamber at one end, and an outlet, H, leading from the opposite end of the chamber, near the top, all as and for the purpose described.

2. The concavo-convex cover or roof of the combustion-chamber, made of plates flanged and riveted to form strengthening-girders, as described.

3. The combination, with the fire-place and combustion-chamber, of refractory tiles arranged in courses at the rear end of the chamber, each course being recessed to receive the course above it, as set forth.

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

JESSE REYNOLDS.

Witnesses:
WM. A. STEEL,
HARRY SMITH.