Nov. 27, 1928. 1,693,043

T. E. MURRAY

HEATER

Original Filed June 17, 1924

Fig. 1.

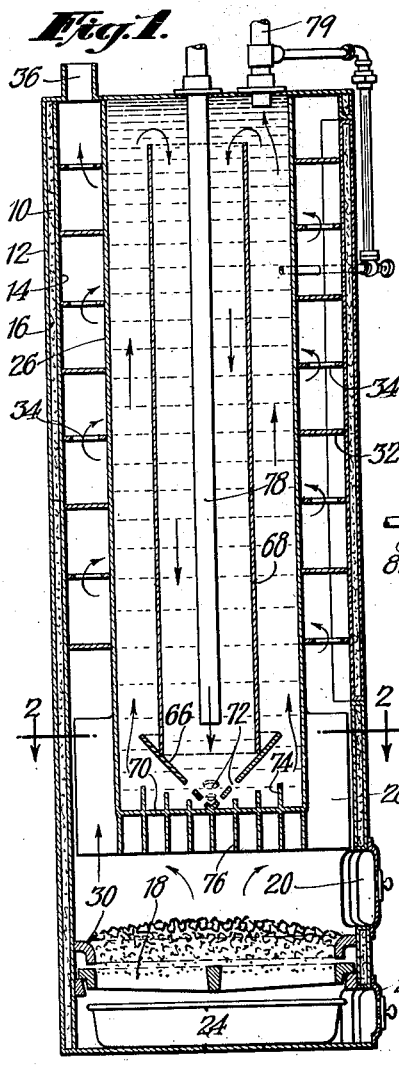


Fig. 3.

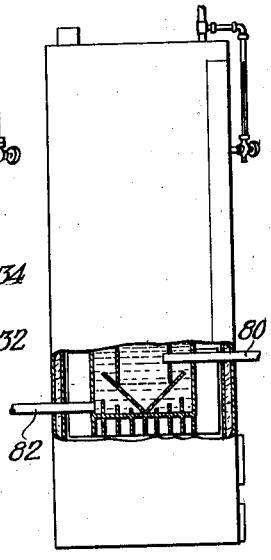


Fig. 4.

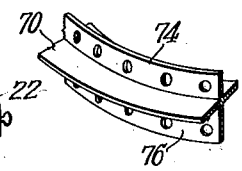
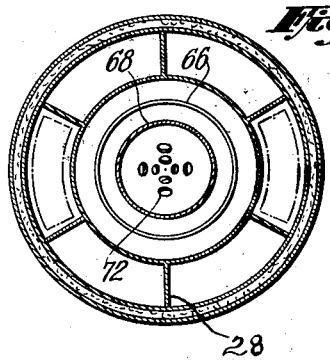


Fig. 2.



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UNITED STATES PATENT OFFICE.

THOMAS E. MURRAY, OF BROOKLYN, NEW YORK.

HEATER.

Original application filed June 17, 1924, Serial No. 720,486. Divided and this application filed December 18, 1925. Serial No. 76,148.

This invention relates to heating apparatus and is a division of my application No. 720,486 filed June 17, 1924. The invention will be understood from the following specification when read in connection with the accompanying drawings in which—

Fig. 1 is a longitudinal section through the heater revealing the interior construction thereof;

Fig. 2 is a horizontal section on line 2—2 of Fig. 1;

Fig. 3 is a view of the lower portion of the heater of Fig. 1 but showing the inlet and outlet water pipes connected differently;

Fig. 4 is a perspective view showing a detail of certain extended surface ribs provided with perforations.

Referring in detail to the drawings, the heater consists of an outer shell 10, made of two cylindrical plates 12 and 14 spaced apart slightly and filled in with insulating material 16 such as asbestos or the like. The heater is provided with suitable grate bars 18, fire door 20, ash pit door 22 and ash receiving pan 24.

Extending throughout the central portion of the heater is a substantially cylindrical receptacle 26 adapted to receive water or steam. Secured to the lower portion of the receptacle 26 are a number of radial ribs 28 which serve to center the receptacle and also to provide an extended surface for rapidly conveying heat from the combustion chamber 30 to the water or steam within the receptacle. At spaced intervals, I provide a number of diaphragms 32. These are formed with openings or ports 34. The ports in adjacent plates are staggered with respect to one another so that the products of combustion issuing from the chamber 30 are obliged to travel in a tortuous path to the outlet flue 36.

I provide novel means for preventing surging of water to the heater or boiler, these means also being adapted to bring the cooler water in contact with the surfaces of the highest temperature. This means includes the cone 66 which is perforated and so arranged that the cooler water coming down through the inner shell 68 is directed toward the plate 70. Without this cone 66, steam may be formed above plate 70 and rise through the inner shell, thereby causing surging and also interference with the circulation. The water emerging from the perforations 72 will cause a rapid flow across the plate 70. This plate may be provided with extended surface fins 74 and 76 as shown, to absorb more heat from the furnace, and transmit it to the water by the fins shown. The fins may be perforated on the water and gas sides as shown in Fig. 4 to allow better circulation of the water and gases respectively. This same device may also be employed on the other forms of heaters. The water inlet pipe 78 extends centrally through the shell 68 and may terminate near the cone 66 or may be cut off at a higher level.

The hot water or steam leaves the heater by pipe 79. In some cases instead of having the inlet pipe extend axially through the inner shell 68, I may introduce the comparatively cooled water through radial extending pipes 80 and 82. The water may be introduced through both pipes or through one pipe only.

Though I have described with great particularity the particular embodiments of the invention herein illustrated, it is not to be construed that I am limited thereto as various changes and modifications may be made without departing from the invention as defined in the appended claims.

What I claim is:—

1. In a device of the class described, a vessel having a longitudinally extending inner shell, a closure for one end of said shell having a restricted water outlet therein, an inlet pipe arranged to admit feed water within said inner shell at a point adjacent said closure, and an outlet for said vessel located at a point remote from said closure.

2. In a device of the class described, a vessel having a longitudinally extending inner shell, a conical closure member at one end thereof having at least one restricted outlet port therein, means for admitting feed water to the interior of said shell at a point adjacent said closure and extended surface members within the vessel adapted to effect a rapid heat transfer to the water passed through said port.

In witness whereof, I have hereunto signed my name.

THOMAS E. MURRAY.