No. 866,834. PATENTED SEPT. 24, 1907.

E. L. ARNOLD.

STEAM BOILER.

APPLICATION FILED JUNE 5, 1906.

Fig. 1.

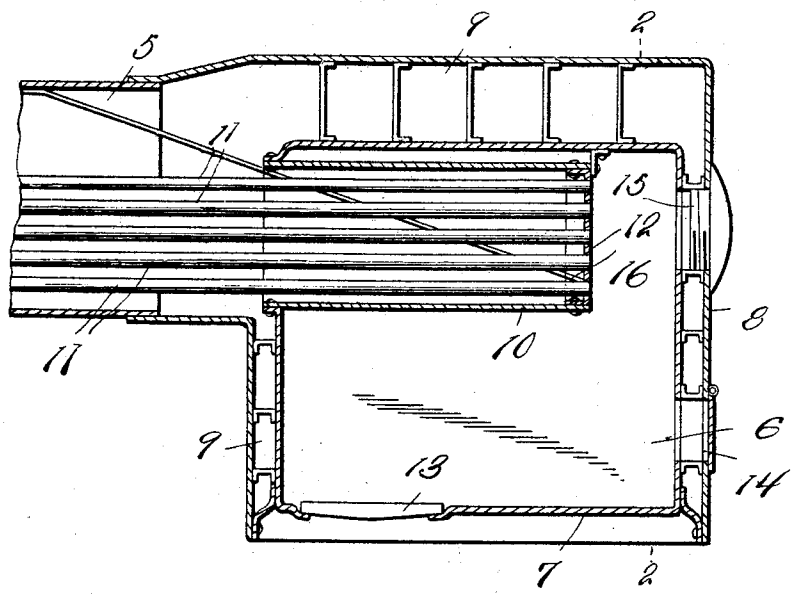
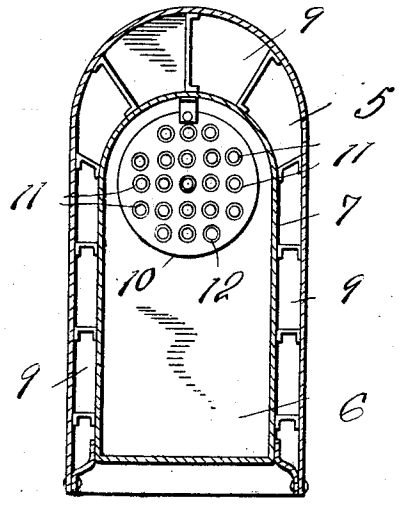


Fig. 2



Witnesses:

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UNITED STATES PATENT OFFICE.

EDGAR L. ARNOLD, OF ALEXANDRIA, MINNESOTA.

STEAM-BOILER.

No. 866,834. Specification of Letters Patent. Patented Sept. 24, 1907.

Application filed June 5, 1906. Serial No. 320,316.

To all whom it may concern:

Be it known that I, EDGAR L. ARNOLD, a citizen of the United States, residing at Alexandria, in the county of Douglas, State of Minnesota, have invented certain new and useful Improvements in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to steam boilers, and more particularly to novel construction of boiler and fire-box in which the maximum amount of heat generated in the fire-box will be utilized to heat the water in the boiler.

The invention further resides in a novel arrangement of the boiler with respect to the fire-box, in such a manner that the proper circulation of heated air through the boiler flues will be obtained.

The invention, broadly speaking, consists in extending the boiler into the fire-box to a point beyond the grate.

In the accompanying drawings: Figure 1 is a vertical longitudinal sectional view through a boiler constructed in accordance with my invention, and, Fig. 2 is a vertical transverse sectional view therethrough on the line 2—2 of Fig. 1.

Referring more specifically to the drawings, the nùeral 5 denotes the boiler, and 6 the fire-box, which latter comprises an inner shell 7 and an outer shell 8, which are spaced to form a water-space 9 between them. Opening through the rear wall of the inner shell 7 of the fire-box and extending forwardly thereinto is a barrel 10, through which extends the boiler flues 11, the said flues opening through a head plate 12 closing the forward end of the barrel. The said forward end of the barrel is located adjacent the forward wall of the inner shell 7 of the fire-box, and throughout its entire surface is in spaced relation to the walls of the box.

The grate 13 for the fire-box is located in the floor of the inner shell 7, which floor forms the dead plate of the fire-box, adjacent the rear wall thereof and directly beneath the barrel 10, although the forward end of the barrel lies in a plane in advance of that occupied by the forward edge of the grate. The usual door 14 is provided in the forward end of the fire-box for the supply of fuel thereto, and in the said end of the fire-box is the ordinary plug 15 for the admission of the cleaning tools.

In order to properly support the barrel 10 in the fire-box, I provide a stay-brace 16, which is secured at one of its ends to the inner face of the head-plate 12 of the barrel, and at its opposite end to the top of the boiler 5.

It will be seen that by reason of the fact that the barrel 10 is in spaced relation to the walls of the fire-box, the heated air from the fuel passes upwardly around each side of the barrel, thereby thoroughly heating the same, and thence to the forward end thereof and through the flues 11.

What is claimed, is:—

In a steam boiler, the combination with a fire box and a grate positioned within the fire box adjacent the front wall thereof, of a hollow cylindrical flue barrel secured at its forward end in an opening in the front wall of the fire box and extending rearwardly with its rear end terminating slightly short of the rear wall of the fire box, the barrel being closed at its said rear end and being entirely open at its front end, flues extending into the barrel through the open front end thereof and opening through the rear end thereof, said barrel being spaced completely from the walls of the fire box except at the point of connection of its front end with the front wall of the fire box, the rear end of the flue barrel being located in a plane considerably removed from the vertical plane occupied by the rear end of the grate, and a brace rod extending into the flue barrel through the open front end thereof and secured at its rear end to the closed rear end of the flue barrel adjacent the lower end thereof.

In testimony whereof, I affix my signature, in presence of two witnesses.

EDGAR L. ARNOLD.

Witnesses:
H. JENKINS,
CONSTANT LARSON.