No. 616,380. Patented Dec. 20, 1898.

C. G. W. WERNICKE.

BOILER.

(Application filed Aug. 5, 1898.)

(No Model.)

Fig. 1.

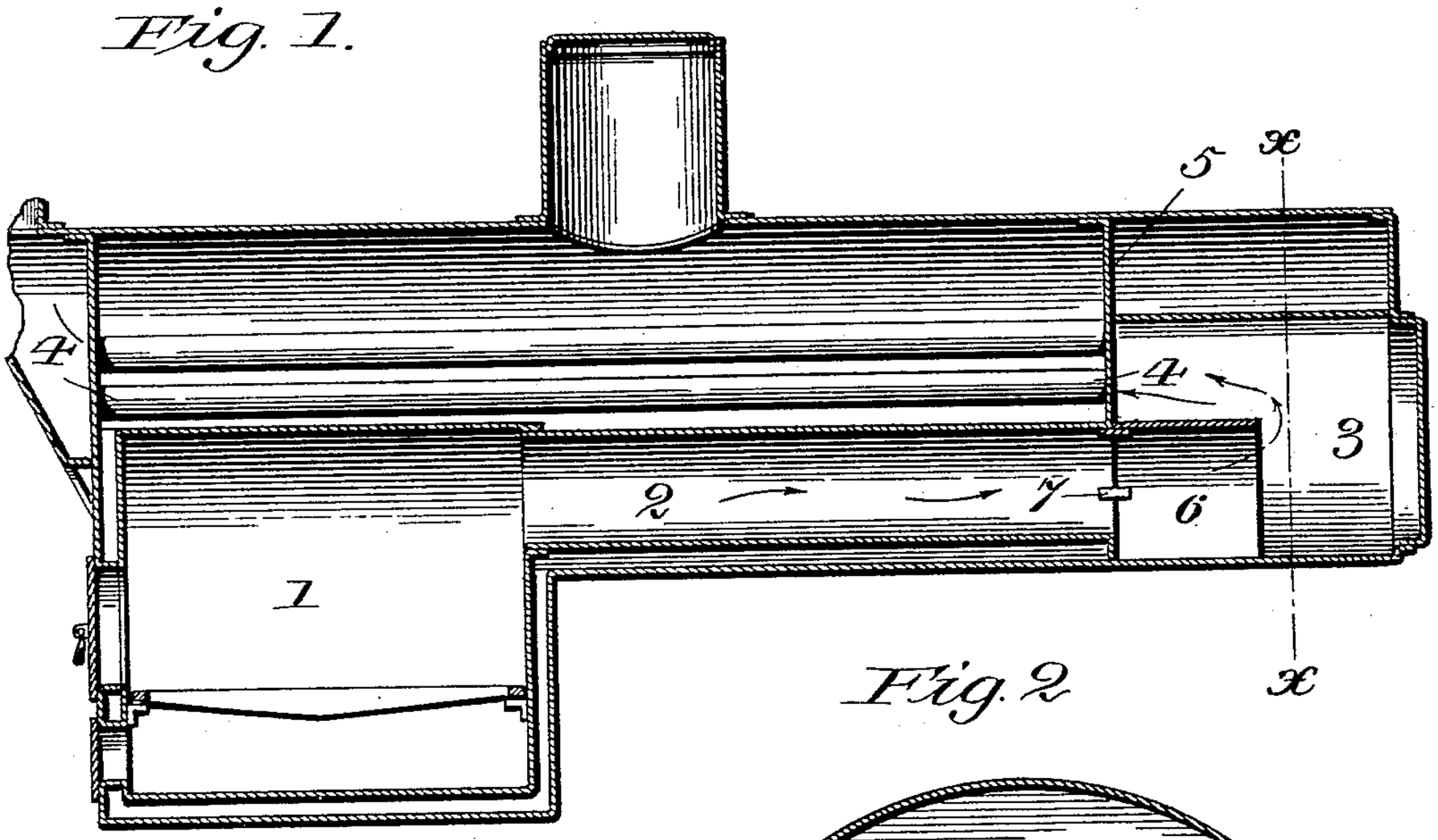
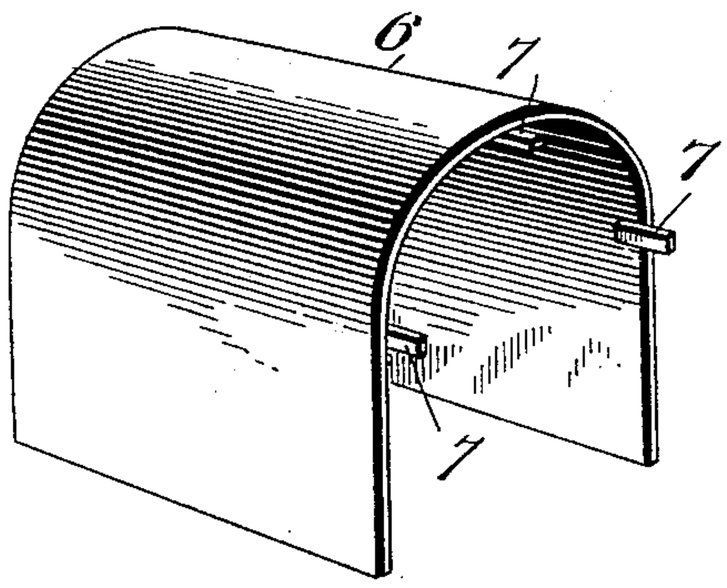
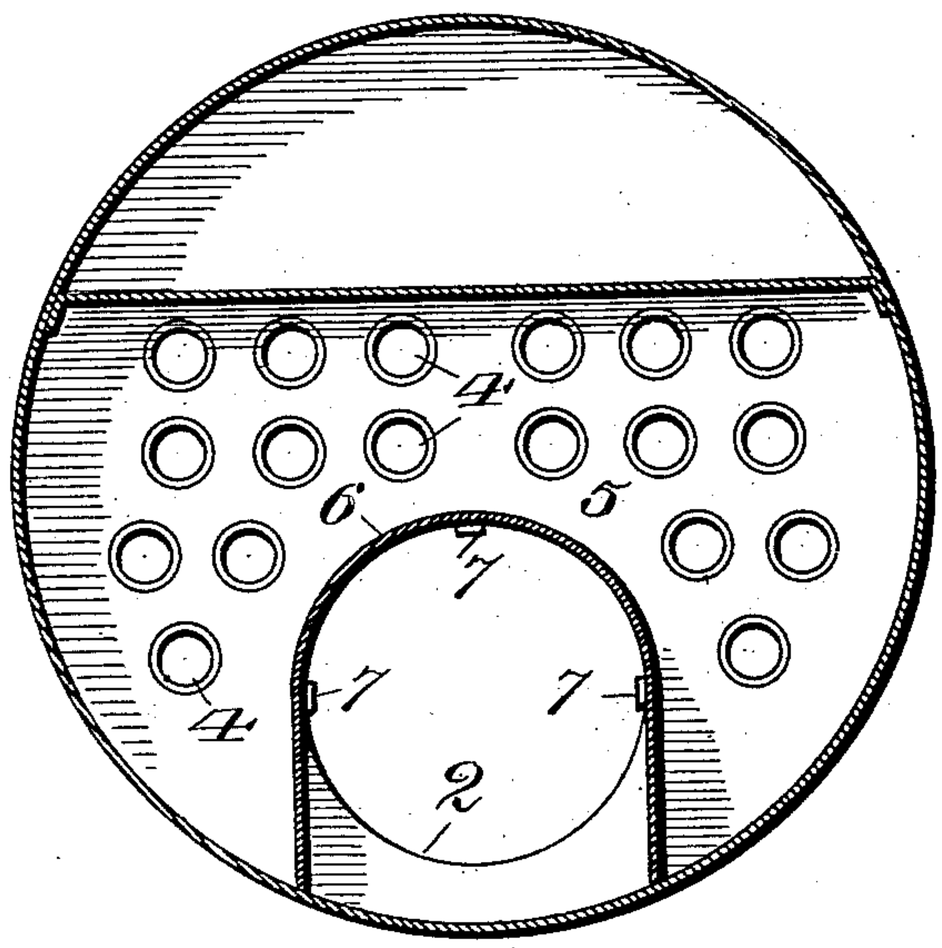


Fig. 2.

Fig. 3.





Witnesses
L. C. Hills.
H. L. Amer.

Inventor
Carl G. W. Wernicke.
by V. D. Stockbridge
his Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CARL G. W. WERNICKE, OF MANKATO, MINNESOTA, ASSIGNOR TO THE NICHOLS & SHEPARD COMPANY, OF BATTLE CREEK, MICHIGAN.

BOILER.

SPECIFICATION forming part of Letters Patent No. 616,380, dated December 20, 1898.

Application filed August 5, 1898. Serial No. 687,818. (No model.)

To all whom it may concern:

Be it known that I, CARL G. W. WERNICKE, a citizen of the United States, residing at Mankato, in the county of Blue Earth and State of Minnesota, have invented certain new and useful Improvements in 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.

In that class of boilers commonly used upon traction-engines and which employ straw and the like for fuel it is customary to have a combustion-chamber at the forward end thereof into which leads a main flue from the fire-box and from which lead small return-flues secured to the flue-sheet at a point in line with the adjacent end of the main flue. The said combustion-chamber is a necessity, as the light fuel employed will not be entirely consumed in passing from the fire-box through the main flue. It has been found, however, by experience that when the ends of the return-flues are directly opposite the end of the main flue the flame and products of combustion will pass directly from the main flue to the return-flues with the result that only a portion of the combustion-chamber is utilized, and with the further result that those return-flues which are nearest the main flue will receive a larger amount of flame than those at a distance therefrom, and that the unconsumed particles of straw will affix themselves to the flue-sheet and impede or entirely cut off the passage of products of combustion therethrough.

The object of my invention is to overcome the objections above noted, and thereby obtain an equalization of the quantity of flame passing through the return-flues and the full benefit of the heating qualities of the flame and products of combustion upon the water-jacket, which partially surrounds the combustion-chamber. This object I attain by extending the main flue beyond the flue-sheet to which the return-flues are attached and into the combustion-chamber to a point intermediate of its ends. The particular mechanism by which it is accomplished will be readily understood by reference to the accompanying drawings, in which—

Figure 1 represents a longitudinal section through a boiler of the class described provided with my improvements. Fig. 2 is a vertical cross-section on the line *x x* of Fig. 1, and Fig. 3 is a detail perspective view of the baffle-plate or hood employed.

Like reference-numerals indicate like parts of the different views.

The fire-box 1 has the main flue 2 leading therefrom and communicating with the combustion-chamber 3. From said combustion-chamber lead the smaller return-flues 4 4, which are secured to the flue-sheet 5, located in line with the forward end of the flue 2. Located within the combustion-chamber 3, resting upon the inner surface of the boiler-shell and abutting against the forward end of the flue 2, is an inverted-U-shaped baffle-plate or hood 6, the same being provided with lugs 7 7 on one edge, which fit within the flue 2 for the purpose of preventing lateral movement of said hood. By this means the flue 2 is practically extended from the flue-sheet 5 into the combustion-chamber to a point intermediate of the ends of the latter and in advance of said flue-sheet. The result is that the flame and hot products of combustion are forced to enter the combustion-chamber at a point in advance of the flue-sheet 5 and to distribute themselves throughout said chamber, thus utilizing the heat thereof upon the water-jacket, which partially surrounds said combustion-chamber. Furthermore, more complete combustion is obtained and the fastening of the unburned particles of straw or other fuel upon the flue-sheet, and the consequent clogging of the openings thereof is avoided. In addition, the amount of flame and products of combustion passing out through the different return-flues 4 is equalized.

The same result may be accomplished by merely extending the main flue 2 into the combustion-chamber or by attaching a supplemental or short pipe to said flue. The reason for employing the baffle-plate or hood 6 is that the same is inexpensive, can be made

of any desired length, and is removable at will.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a boiler of the class described, the combination with the combustion-chamber, the main flue leading from the fire-box to the combustion-chamber and the return-flues communicating with the combustion-chamber, of a removable extension for the main flue and frictional engaging means between the main flue and the extension, the said extension leading into the combustion-chamber and terminating at a point in advance of the return-flues.

2. In a boiler of the class described, the combination with the combustion-chamber, a main flue and return-flues communicating therewith, of a removable extension for the main flue, consisting of a hood having an arch-shaped upper end and parallel sides which rest upon the inner surface of the boiler-shell and are provided with lugs which are adapted to fit within the main flue and frictionally hold the same in place thereon.

3. In a boiler of the class described, the combination with the combustion-chamber, of main and return flues communicating therewith, and a removable baffle-plate or hood fitting within said combustion-chamber, constituting an extension of said main flue, and provided with lugs on one edge which engage said main flue and prevent lateral movement of said baffle-plate.

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

CARL G. W. WERNICKE.

Witnesses:
A. E. CLARK,
D. G. ROBINSON.