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W. AVERY.

STEAM BOILER.

Patented June 28, 1836.

Fig. 1.

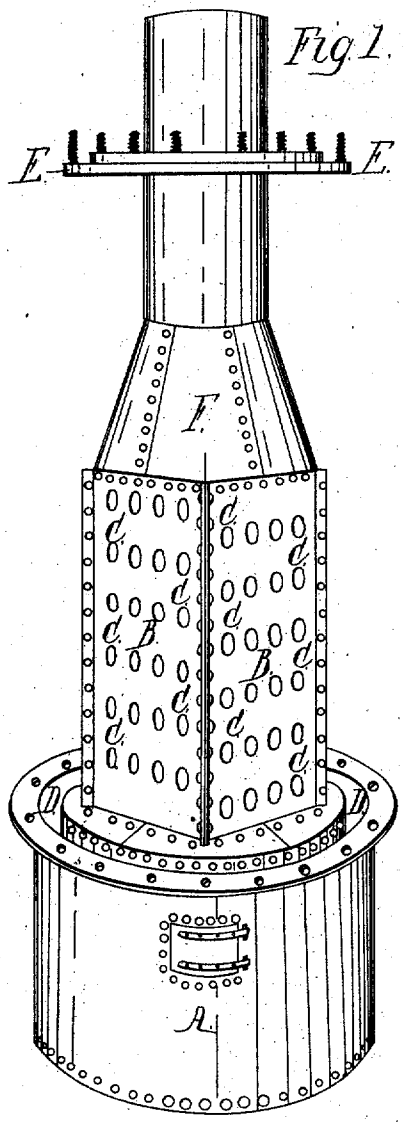


Fig. 2.

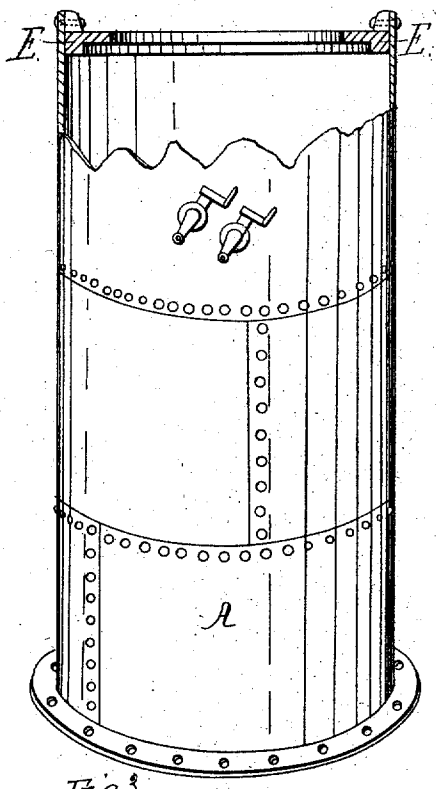
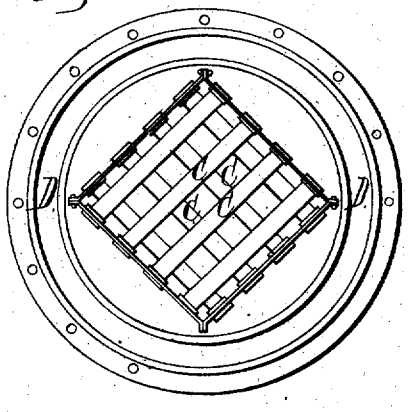


Fig. 3.



9785X

William Avery of Syracuse Co of Onondaga State of Newyork (485) Letters Patent

The schedule referred to in these Letters Patent and making part of the same, containing a description in the words of the said William Avery himself of his improvement in the boiler for generating steam

To all whom it may concern: Be it known that I William Avery of Syracuse, in the county of Onandaga in the State of Newyork have invented an improved boiler for generating steam for steam engines, and for other purposes and I do hereby declare that the following is a full and exact description thereof reference being had to the drawings which accompany and make a part of this description—

In describing this boiler I shall as a guide in its construction mention such dimensions of the respective parts, as according to my observations are a good proportion to each other, but without intending thereby to limit myself in this particular as it is evident that the absolute size must be governed by the purpose to which it is to be applied and that the proportion of the individual parts to each other will admit of considerable variation while the principle of construction remains unchanged—

The exterior appearance of the boiler is that of a vertical cylinder A in Fig 1 being the lower portion of the Cylinder upon which the part A, Fig 2 is to be placed, the two being united together by bolts and flanges with a gasket interposed— The furnace is contained within A Fig 1 there being a second or interior Cylinder with a space D between them, which space is filled with water— The aperture for the feeding door and also that for an ash pit door are of course to extend through the water space so to connect the outer and inner Cylinders— The inner Cylinder forming the crown or walls of the furnace is surrounded by a part B B and is made a square immediately above that Cylinder and forms part of the flue, and of the boiler C C are the openings of tubes which are and from side

9785X

6 sides of this square the alternate rows of tubes being at right angles to each other as seen at C fig 3.

The part marked F is a condemnation of the flue, connecting the square part B with the round chimney and is therefore square at the lower and round at its upper end.

The cylinders A may be three feet in diameter and eight feet in height, the flanch for fastening them together, two feet from the bottom. The space D between the two cylinders may be four inches. B B is twenty inches square and three feet high, it is pierced as in section in each plate, the ends of twenty four hundred tubes making in the whole 48 tubes, the holes are at equal distance from each other and the tubes must be firmly fixed by riveting or otherwise.

The conical part E terminates at its upper end in a circle of twelve inches diameter. E E fig 1 & 2 are flanches by which the upper end of the boiler and the flue are attached together by bolts, a gasket &c. steam and water-cocks, a safety Valve and the other usual appendages to a steam boiler are of course employed, but these do not need my description. In boiler the general construction of which is that above described, offers several advantages over most if not all others. The square portion immediately above the furnace, and which receives the tubes in the way described, will admit of expansion and contraction in such a way as will not tend to loosen the tubes even should the expansion or contraction be from any cause rendered unequal. The water space by the particular construction of the boiler is greatest at the mouth of the tubes where it is most needed, and where the heat is most intense namely on the lower tubes, there will at all times be a pressure of at least three feet head of water. Should the water accidentally be allowed to descend below the upper range of tubes, the portion of heat from the furnace which will reach them will not be sufficient to be productive of injury.

What I claim therefore as my invention & improvement is the general construction form and combination

of the respective parts as above described, by which general combination I do not merely intend a vertical boiler with a double case between which the water to be heated is contained, the furnace being situated within the inner case and having tubes for heating water, such boilers having been heretofore constructed, but a distinguishing characteristic of my boiler is the combination of these parts with the square portion, which receives the tubes and which is marked B in the drawings together with such variations of which the same is susceptible, whilst the general characteristics by which it is distinguished remain substantially the same

Witnesses
Elam Lynds
Addison R. Gilmore

William Avery
Inventor