

(Model.)

C. J. GALLOWAY.
STEAM BOILER.

No. 253,365.

Patented Feb. 7, 1882.

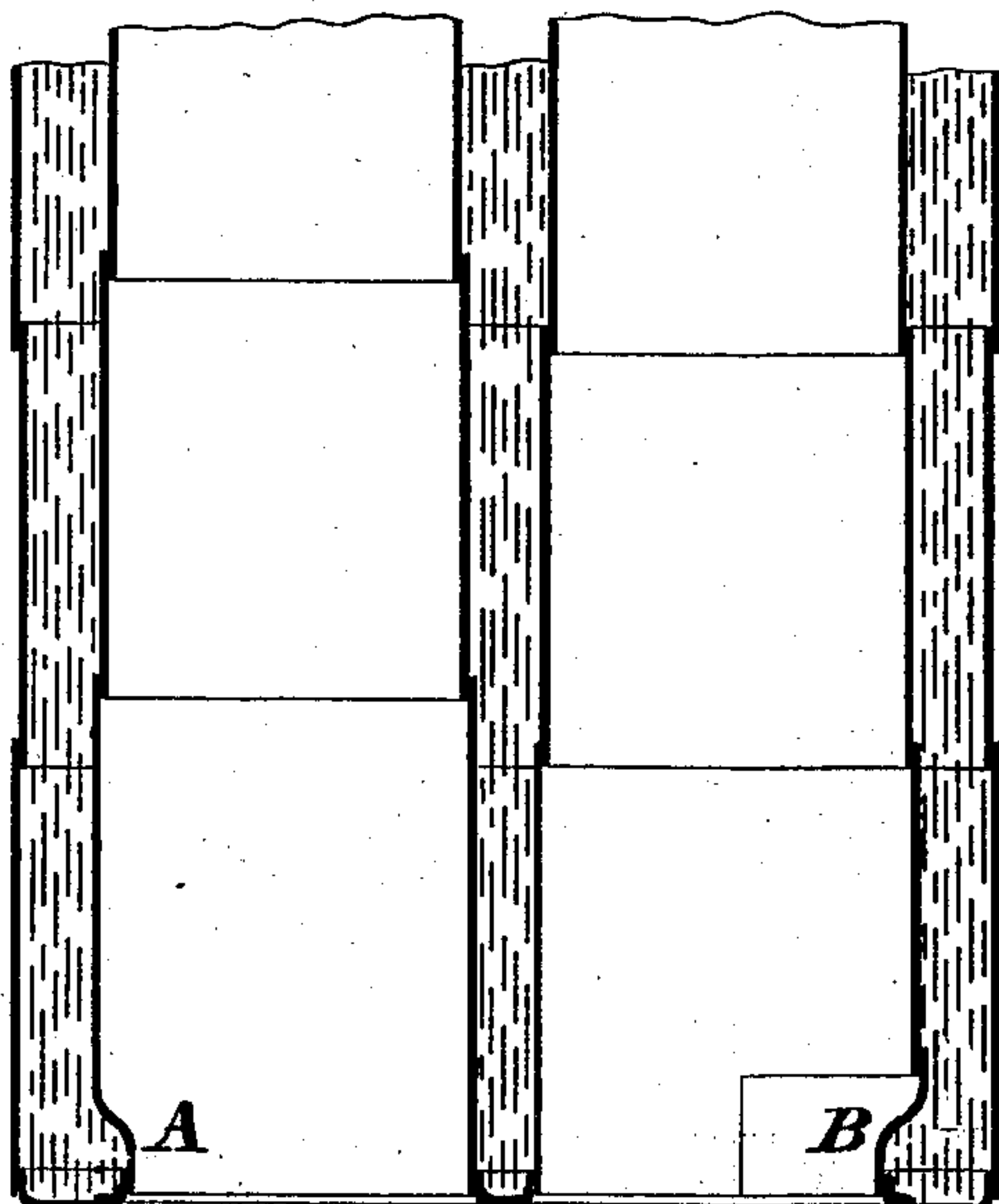


Fig. 2

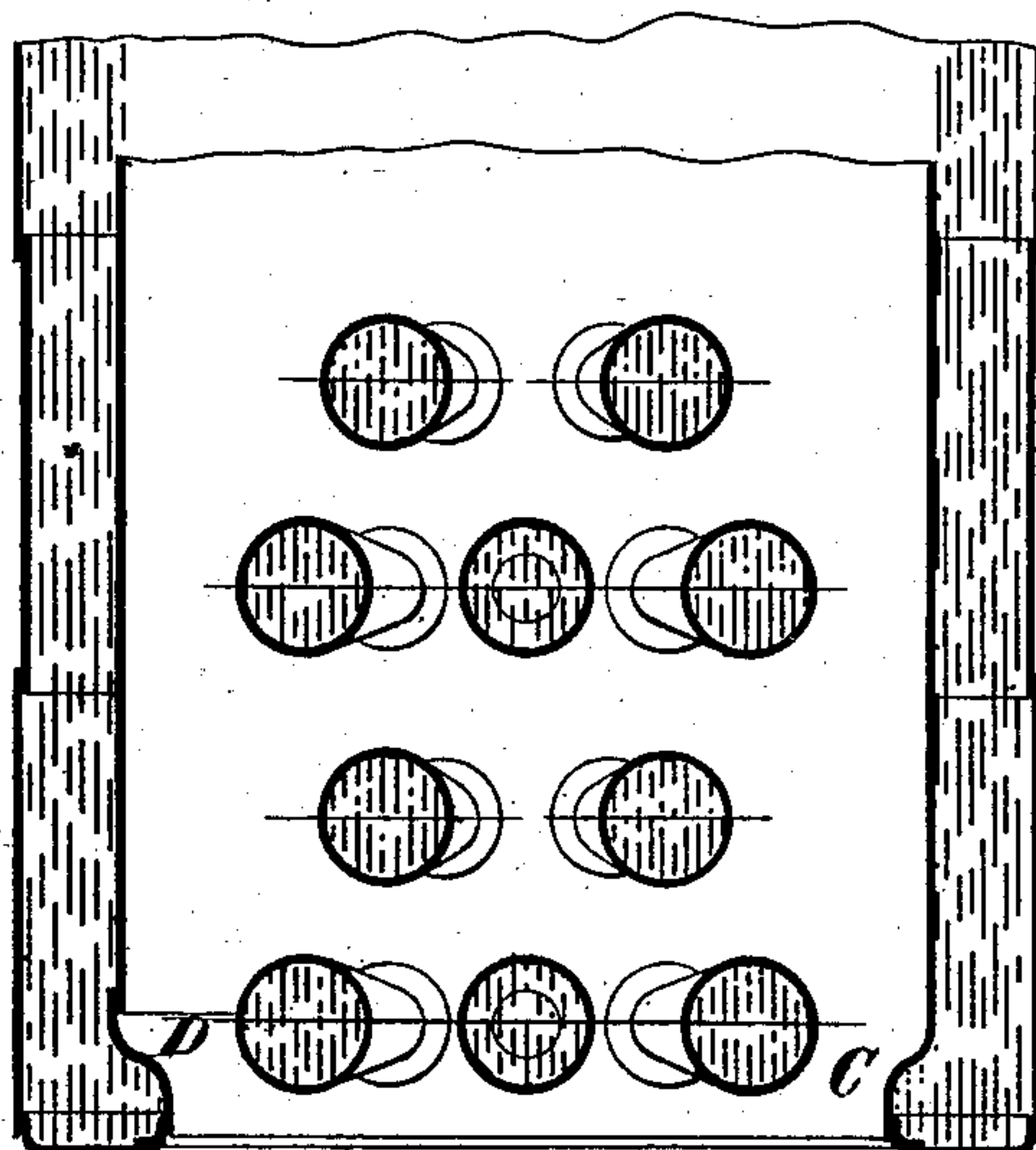


Fig. 4

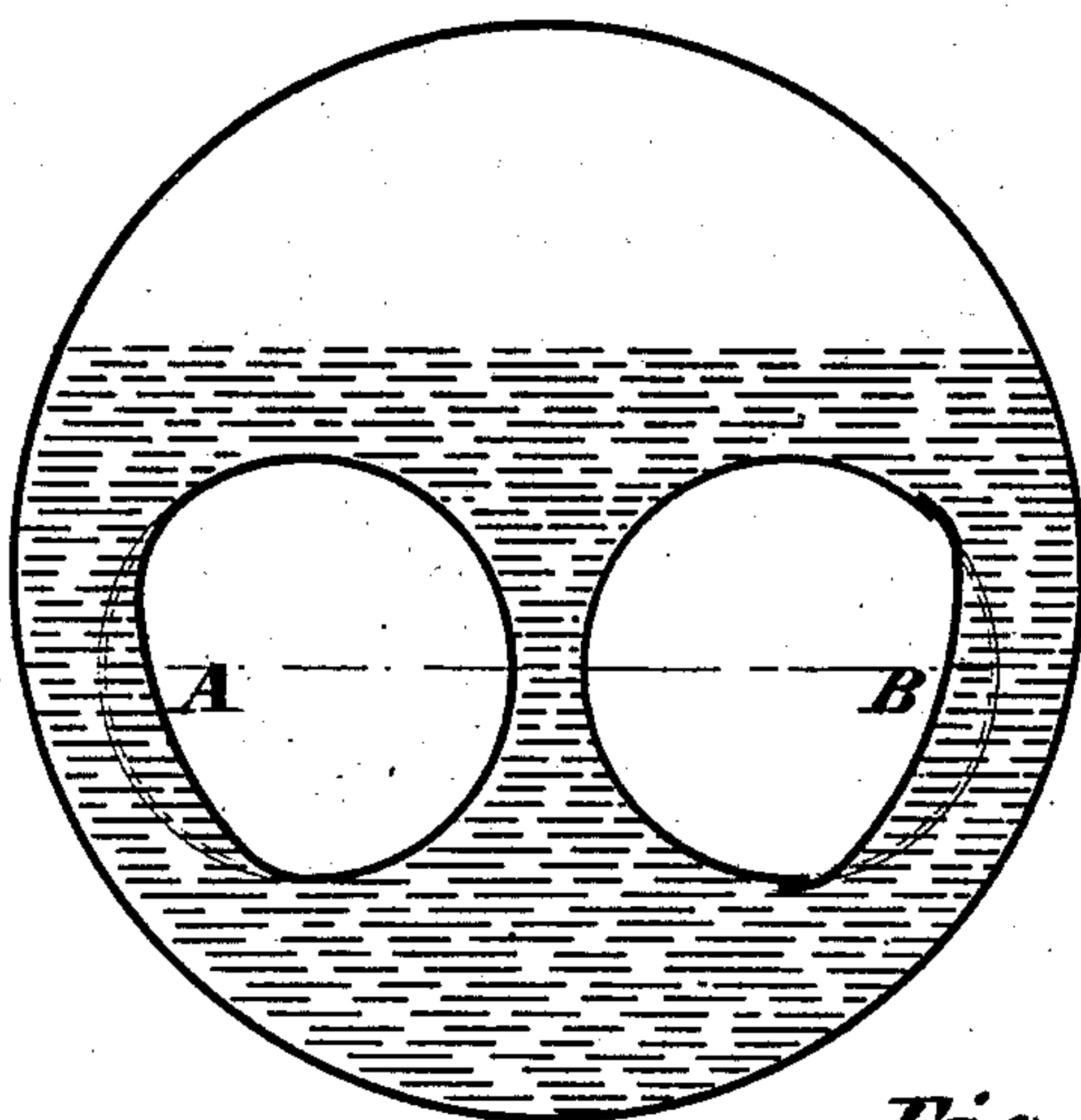


Fig. 1

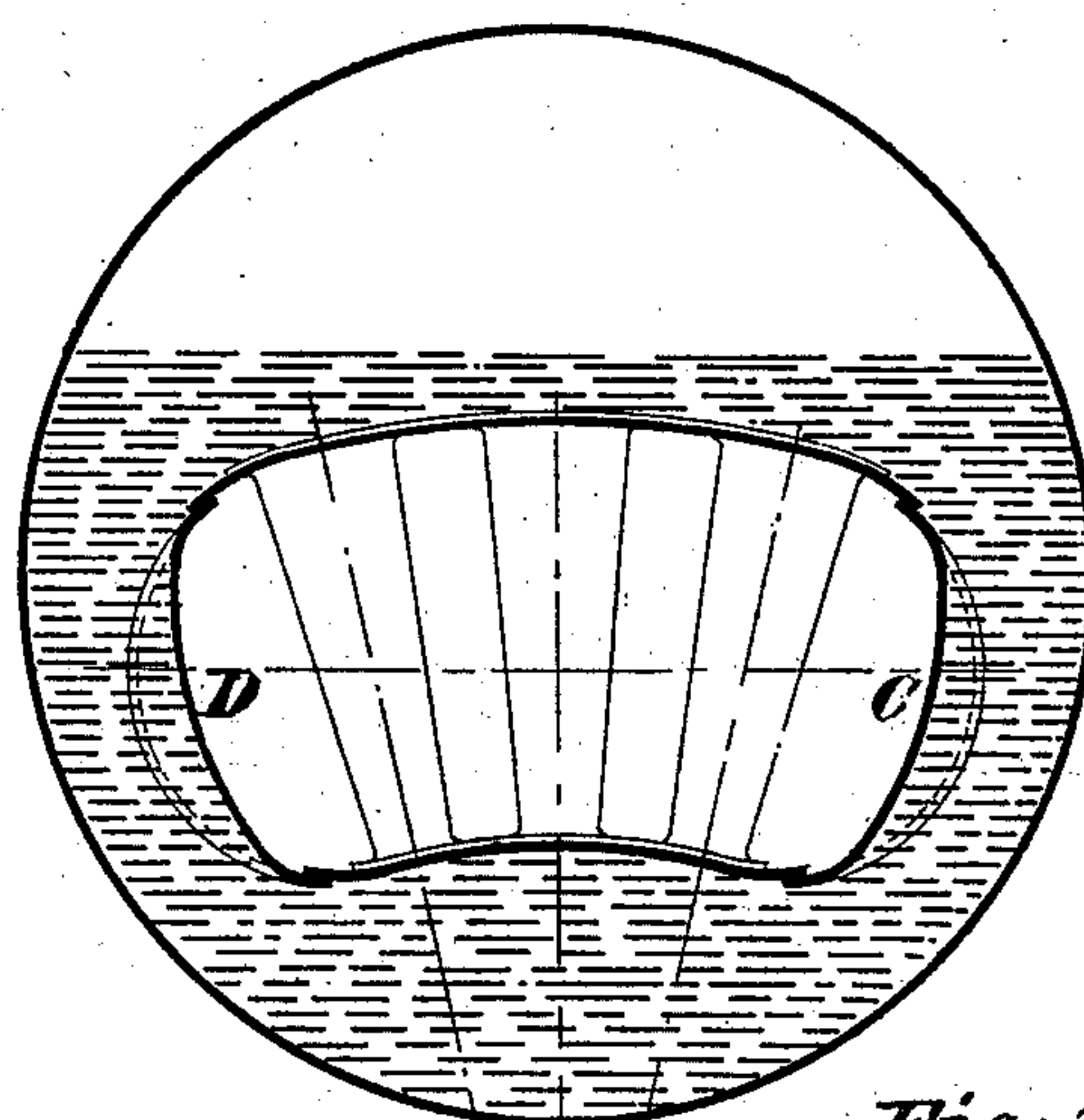


Fig. 3

Witnesses:
J. Sellers Bancroft
Jacob Brooks

Inventor:
Charles John Galloway
per Wm. Sellers at,

UNITED STATES PATENT OFFICE.

CHARLES J. GALLOWAY, OF MANCHESTER, COUNTY OF LANCASTER,
ENGLAND.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 253,365, dated February 7, 1882.

Application filed March 8, 1880. (Model.) Patented in England January 14, 1876.

To all whom it may concern:

Be it known that I, CHARLES JOHN GALLOWAY, of Knott Mill Iron Works, Manchester, in the county of Lancaster, England, engineer, have invented an Improvement in Steam-Boilers; and I do hereby declare that the following description, taken in connection with the accompanying drawings, hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of the said improvements by which my invention may be distinguished from others of a similar class, together with such parts as I claim and desire to secure by Letters Patent—that is to say:

My improvements relate more particularly to the construction of steam-boilers now generally known as "Galloway" boilers, in which one or more internal flues, either of a circular, elliptical, or other curved form, are provided, having tapering transverse water-tubes fixed therein. The said improvements are, however, equally applicable to all single or double, internal-flued, or Cornish boilers. In such boilers, when the internal flue or flues are continued of their full diameter to the back plate of the boiler, the rivets that secure them to the back plate approach at one point or at two points of the circumference so near to the rivets that secure the back plate to the cylindrical shell that no sufficient surface of back plate intervenes between the two lines of riveting to allow freedom for expansion and contraction of the flue without straining the rivets, and in consequence thereof a leakage frequently occurs at the rivet-holes at those joints. Now, according to my present invention, I obviate this defect by stopping short the flue at the point or points where it approaches nearest the cylindrical shell of the boiler, and connecting it to the back plate at such point or points by means of a bent plate of such a form that it fits the cylindrical or other curved surface of the flue and then curves inward away from the cylindrical shell and is riveted with a straight or slightly-curved flange to the back plate at some distance from the shell. The hole in the back plate for the flue is thus made to present the form of a circle, ellipse, or other curve, with a segment or segments cut off at the point or points where it approaches nearest the cylindrical shell. By this arrangement sufficient surface is provided in the back plate to allow freedom of expansion and contraction for the

flue without straining the rivets, in addition to which the curved form of the connecting plate or plates also allows it or them to yield somewhat as the flue expands or contracts, so that the whole strain is not put upon the back plate. According to another arrangement I stop the entire circular or other shaped flue short of the back plate, and I connect the two parts by means of a solid welded iron ring that fits the flue at one end and then curves inward all round, so as to fit with a flange against a hole of sufficiently-reduced size in the back plate.

Figure 1 represents a transverse section, and Fig. 2 a sectional plan, of a boiler having two cylindrical flues to which my invention is applied; and Fig. 3 represents a transverse section, and Fig. 4 a sectional plan, showing its application to a boiler having a flue of the kind described in the specification to Letters Patent granted to me, the said C. J. Galloway, and C. H. Holt on the 8th of August, 1876, No. 180,863.

Referring to Figs. 1 and 2, it will be seen that the ends of the flues at the sides next the outer casing are connected to the end plate of the boiler by curved portions bent inward, which may either be made in one piece with the body of the flue, as shown at A, or may be a separate piece, as shown at B. In Figs. 3 and 4 a like construction is shown, the bent portion of the flue being either in one piece with it, as at C, or being a separate piece, as at D.

It is obvious that a bent piece, such as B or D, instead of extending partially round the flue, might be carried entirely round it.

Having thus described the nature of my invention and in what manner the same is to be performed, I claim—

A boiler-flue constructed at its end substantially as described, whereby the distance between the shell of the boiler and the edge of the opening through the head is increased at one or more places, for the purpose specified.

In witness whereof I, the said CHARLES JOHN GALLOWAY, have hereunto set my hand and seal this 12th day of February, in the year of our Lord 1880.

CHARLES JOHN GALLOWAY. [L. S.]

Witnesses:

JAMES ELLAM STRETFORD,
JAS. STEVENS HALME.