

(No Model.)

J. MITCHELL.

STEAM BOILER.

No. 310,071.

Patented Dec. 30, 1884.

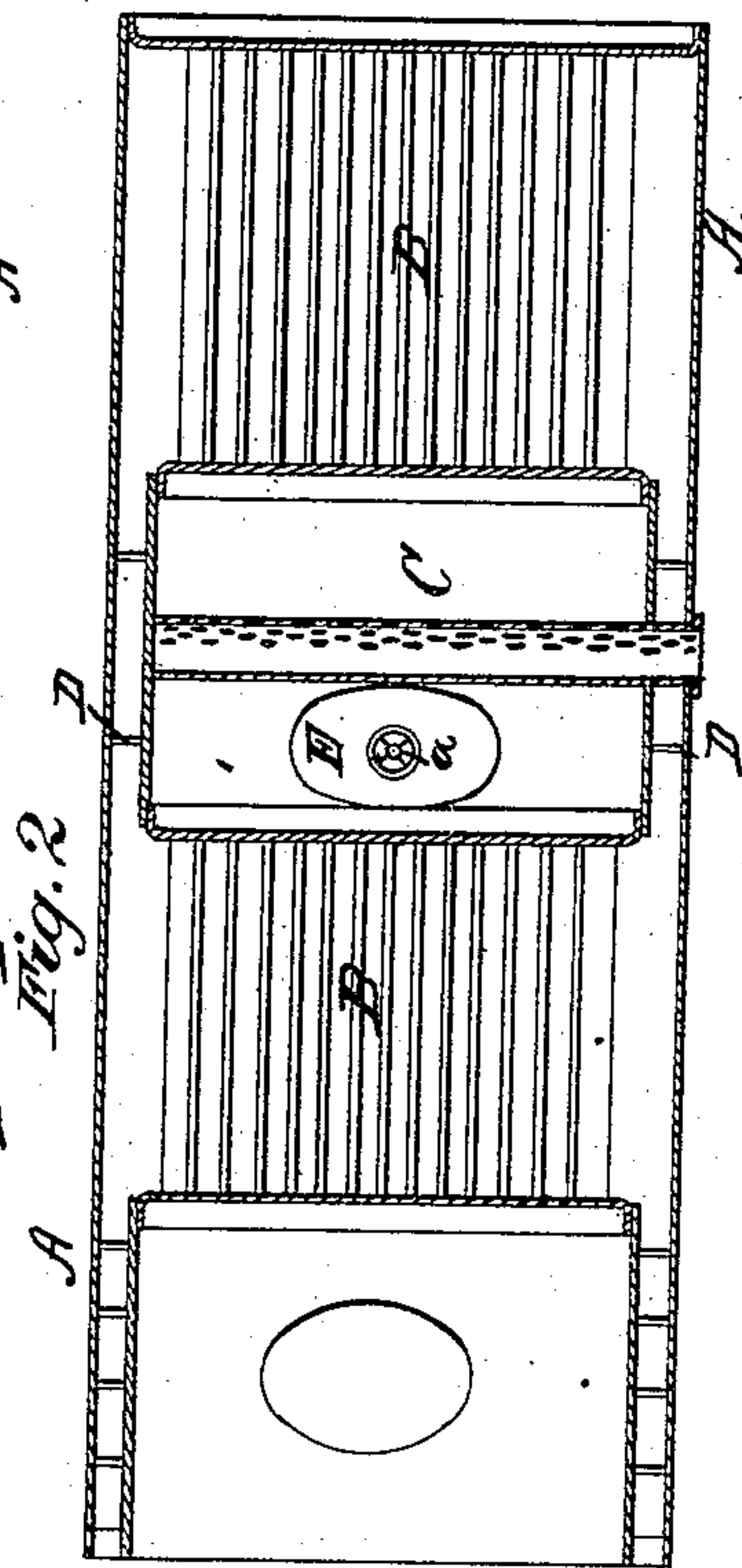
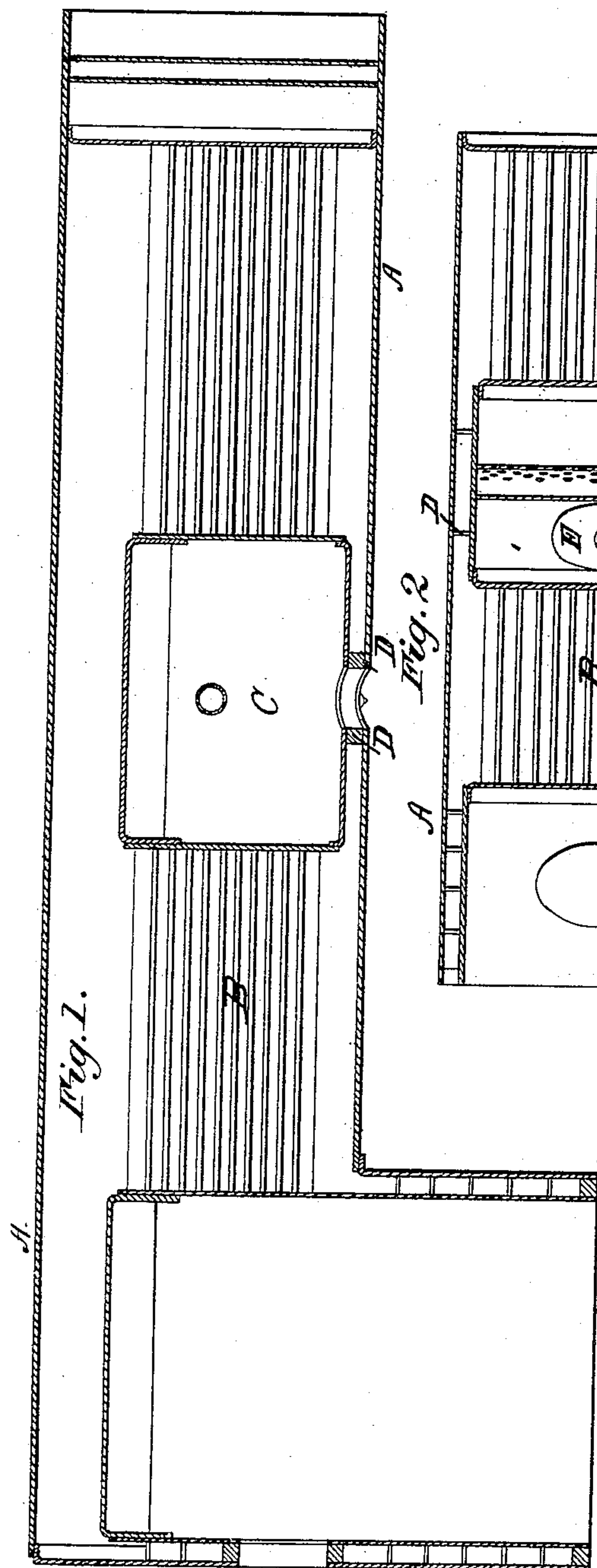


Fig. 3.

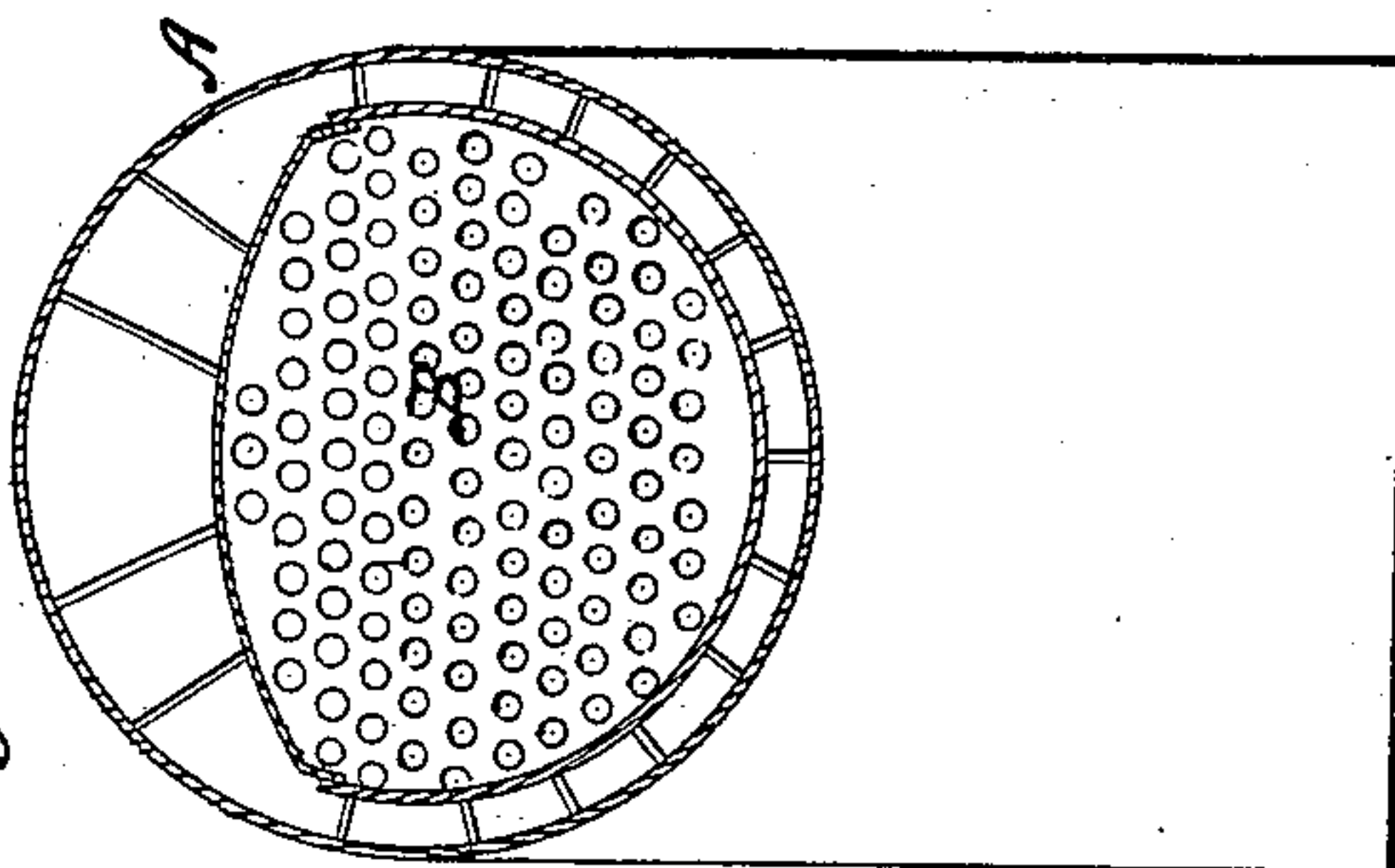
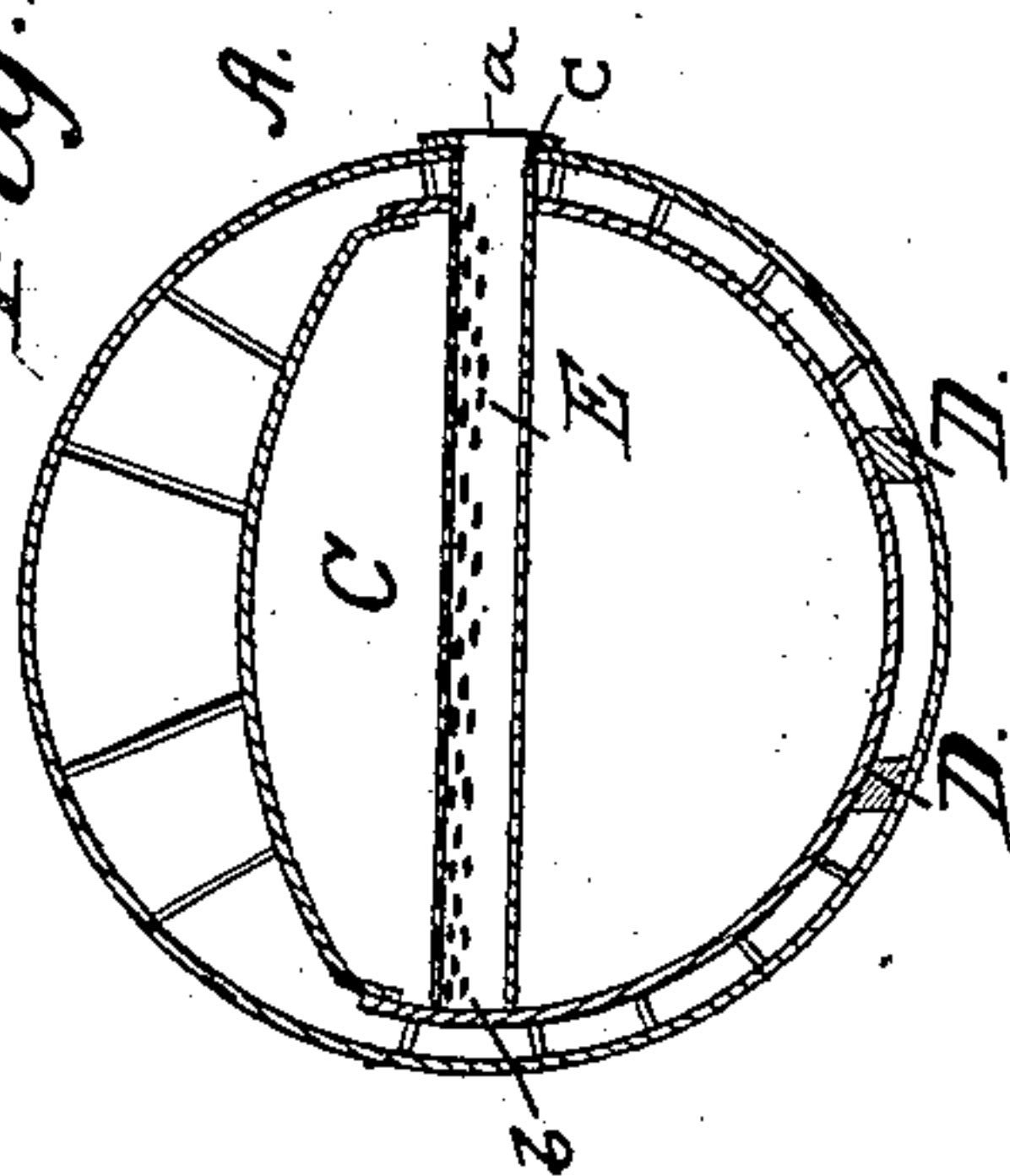


Fig. 4.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN MITCHELL, OF LOUISVILLE, KENTUCKY.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 310,071, dated December 30, 1884.

Application filed September 19, 1883. Renewed November 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN MITCHELL, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, 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 consists in certain improvements in the construction of steam-boilers, as hereinafter described and claimed.

In the drawings, Figure 1 represents a longitudinal vertical section of a boiler constructed according to my improvements. Fig. 2 represents a sectional plan view thereof. Fig. 3 represents a section on the line 3 3 of Fig. 2. Fig. 4 represents a vertical section of the combustion-chamber.

My invention consists, essentially, in constructing locomotive and other steam boilers with the combustion-chamber in the center of the waist of the boiler, and in extending a perforated pipe transversely across said combustion-chamber, said perforated pipe connecting at one end with either the exhaust-steam pipe from the engine or with a suitable live-steam supply, whereby steam is supplied to the combustion-chamber for the purpose of increasing the combustion of the smoke, cinders, and gases therein.

A represents the walls of a boiler, of ordinary construction.

B represents the flues or tubes, which, instead of extending the entire length of the boiler, are of half the usual length.

C represents the combustion-chamber, which is arranged centrally or nearly centrally of the waist of the boiler, and with which the inner ends of each series of flues connect. By thus arranging the combustion-chamber centrally of the waist of the boiler, a much larger quantity of the smoke resulting from the combustion of the coal or other material is consumed than where the combustion-chamber is placed at the rear end of the waist;

and by forming the flues of half-lengths, instead of extending them continuously throughout the length of said waist, their expansion and contraction are considerably lessened or avoided, they are more easily removed from and placed in position, and a great saving is effected by their use, as it is well known that the tubes are more injuriously affected at those ends nearest the fire-box than at their other ends; consequently by forming such tubes in sections only a portion thereof needs replacement within a given time, instead of the whole, where such tubes or flues are of continuous length. The combustion-chamber is supported in position within the waist of the boiler by blocks or plates D D at the bottom and sides, which are bolted thereto and to the boiler. By this means the chamber supports the boiler and greatly increases its strength at those points.

E represents a pipe having perforations *a* extending about half around on the upper side. This pipe has a closed end, *b*, which, when said pipe is passed through a hole in or about the center of one side of the combustion-chamber, is secured to the inner face of the opposite end thereof by any suitable means. The opposite end, *c*, of said perforated pipe is screw-threaded, and is screwed into position and supported therein within a screw-threaded flange, *d*, on the outside of the waist of the boiler. This screw-threaded end is open, and has suitable connection either with the exhaust-pipe of the engine, by means of which the exhaust-steam therefrom is conveyed to such perforated exhaust-pipe, or it is similarly connected with a live-steam supply, as desired or found convenient. Steam, either exhaust or live, as desired, as it passes into this perforated tube E, escapes therefrom through the perforations *a* in the form of jets or spray into the combustion-chamber, and as the smoke, cinders, and gases collect in said combustion-chamber and come in contact with the flame and the steam jets or spray, an increased consumption of the products of combustion is secured over that secured by the ordinary form of boiler.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

5 A tubular steam-boiler having a combustion-chamber dividing the tubes transversely between the fire-box and uptake, in combination with a perforated pipe through which steam is admitted to said combustion-

chamber, substantially as and for the purpose set forth.

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

JOHN MITCHELL.

Witnesses:

WM. RUSSELL,

W. W. MELONE.