

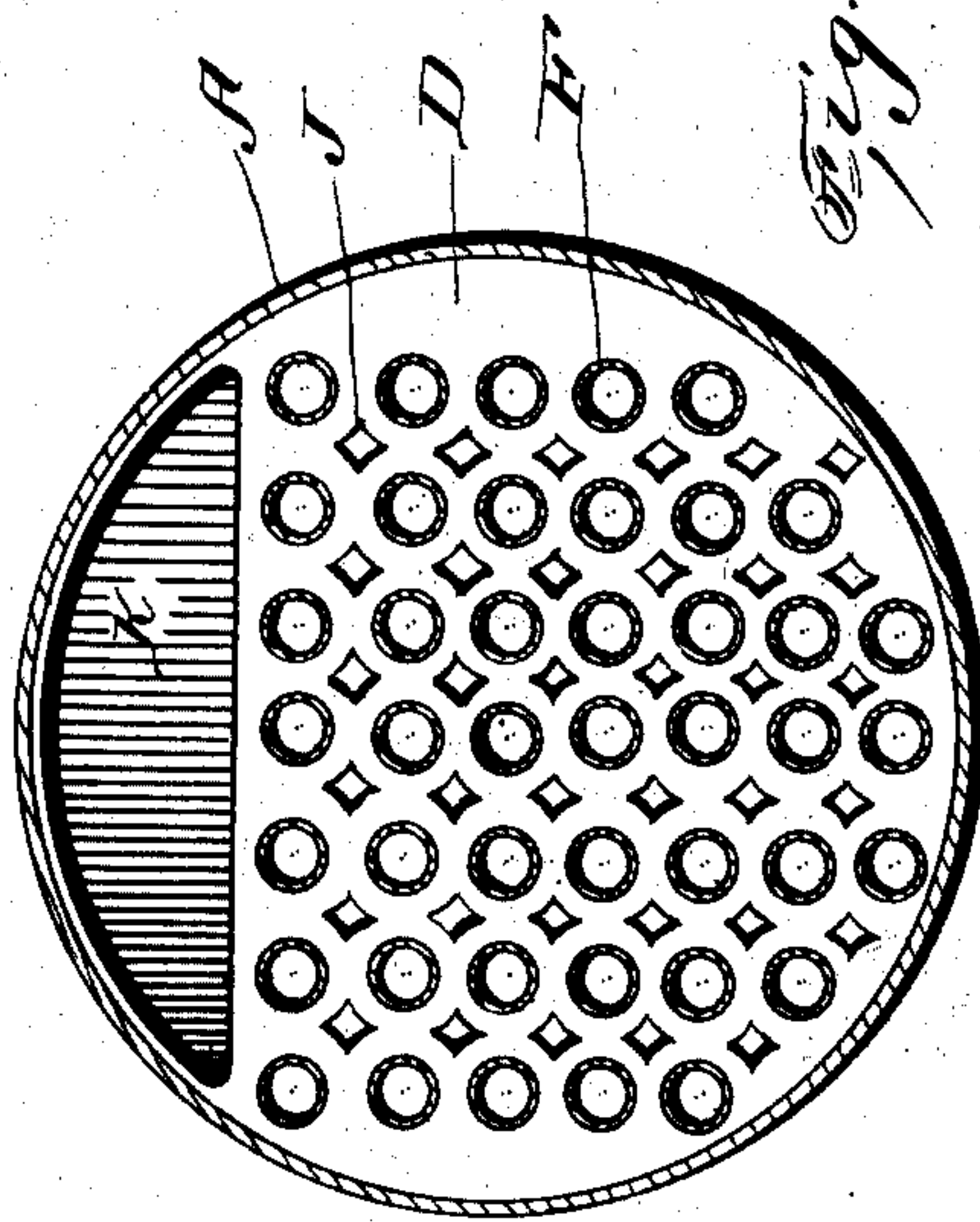
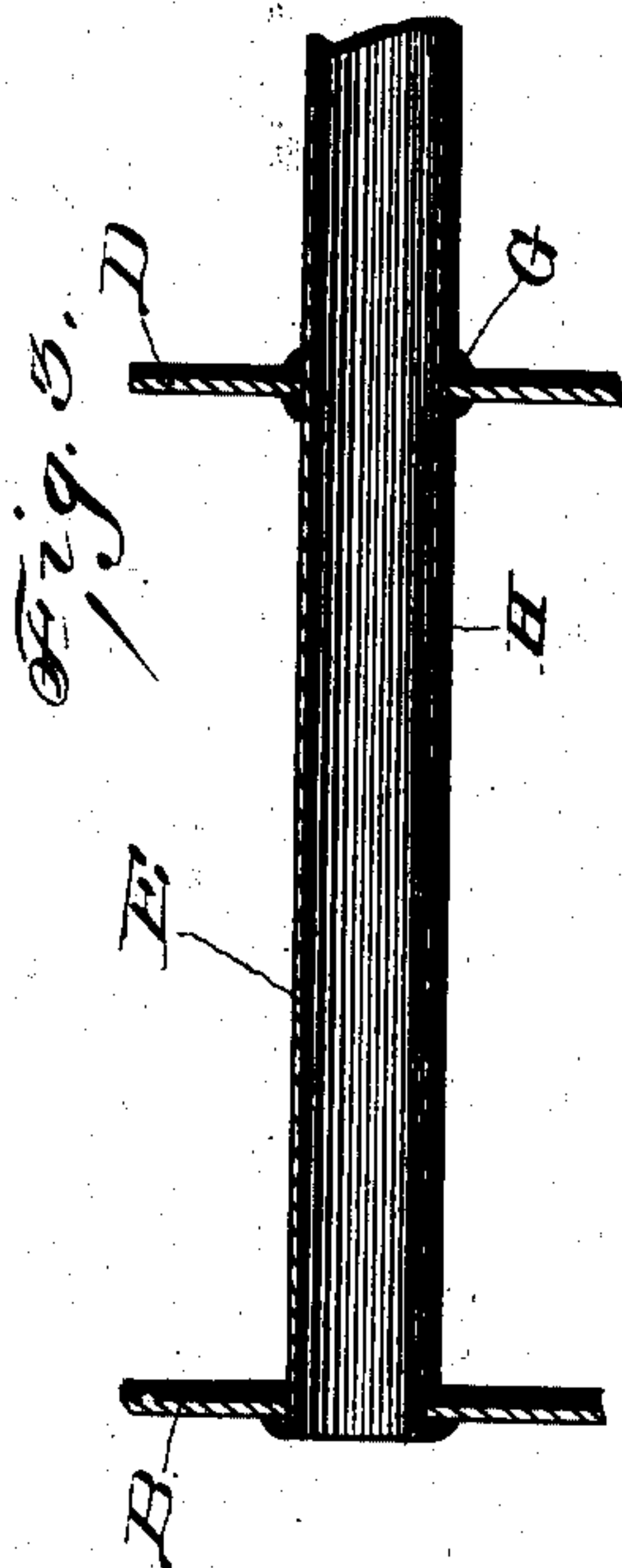
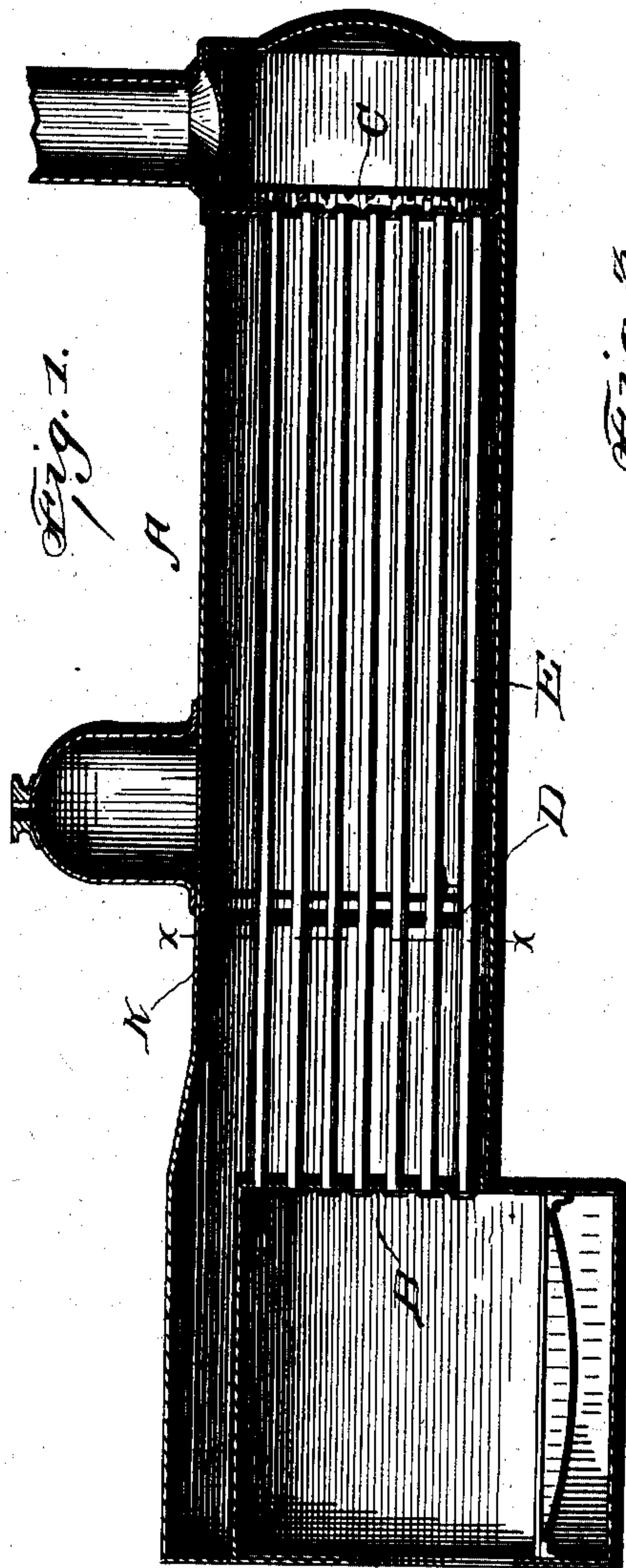
No. 706,490.

Patented Aug. 5, 1902.

J. J. GAGE.
LOCOMOTIVE BOILER.

(Application filed Mar. 7, 1902.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH J. GAGE, OF MANSFIELD, OHIO.

LOCOMOTIVE-BOILER.

SPECIFICATION forming part of Letters Patent No. 706,490, dated August 5, 1902.

Application filed March 7, 1902. Serial No. 97,110. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH J. GAGE, a citizen of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Locomotive-Boilers, of which the following is a specification.

My invention relates to improvements in locomotive-boilers; and the objects of my invention are, first, to provide a means to lengthen the durability of boiler-flues in locomotives; second, to prevent a certain amount of vibration to the flues when the engine is in motion, obviating to a great extent the flues from becoming loose in the flue-sheet next to the fire-box. These objects I accomplish by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a locomotive-boiler embodying my invention. Fig. 2 is a transverse sectional view enlarged, taken in line *x x*, Fig. 1, showing the construction of the inner flue-sheet. Fig. 3 is a longitudinal sectional view of one of the flues, also a portion of the inner and outer flue-sheets, enlarged to show more fully the construction and arrangement of the parts constituting my invention.

Similar letters of reference indicate the several parts throughout the several views.

In the accompanying drawings, A indicates a locomotive-boiler which is of the class now in general use; B and C, the flue-sheets or heads in which are secured the ends of the flues. The flue-sheet B indicates the head of the boiler next to the fire-box and forms the back wall of the same.

In the place of only using a front and rear end flue-sheet I place in the front of flue-sheet B a third, (indicated by the letter D.) This flue-sheet is flanged around its outer periphery and is secured in a suitable manner within the boiler about two and one-half feet in front of the sheet B. The object of the said head or flue-sheet is to shorten the length of bearings by forming a support for the flues E between the two end flue-sheets. By placing the sheet D in the position as shown in Fig. 1 it prevents the flues from springing from their normal line when the locomotive is in motion. The openings F in the flue-

sheet D are sufficiently large to admit a copper sleeve G, which surrounds the flues E. The said sleeve is swaged upon each side of the flue-sheet D, holding the flues firmly in position. Placed within the interior of the flues E are short flues H. They are sufficiently large in their outer diameter to fill the interior diameter of the flues. These flues extend from the fire-box a sufficient distance to pass through the flue-sheet D, the outer ends expanded and swaged over the ends of the flues E. The objects of the said inner flues are to strengthen the flues next to the fire-box, and by swaging the same over the ends of main flues protects the ends from coming in contact with the fire and preventing them from turning and becoming loose, which is of common occurrence in all locomotive-boilers.

The inner flue is fully shown in Fig. 3. Between each of the openings for the flues in the flue-sheet D are perforations J and also an opening K above the line of flues. The perforations and opening are to allow a free passage for the water and steam.

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

In a device of the type set forth, the combination with a boiler having front and rear heads, of an intermediate vertical head secured in front of the rear head, with a series of horizontal flues passing through all of said heads, the intermediate head supporting the weight of the flues between the front and rear heads, a series of short flues located within said first-named flues and extending from said rear head through the intermediate head, the rear ends of said short flues being swaged over the ends of said horizontal flues, said short and horizontal flues being of the same thickness throughout, substantially as described.

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

JOSEPH J. GAGE.

Witnesses:

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