

C. B. Hoard,
Steam-Boiler Attachment.
No. 14,721. Patented Apr. 22, 1856.

Fig. 1

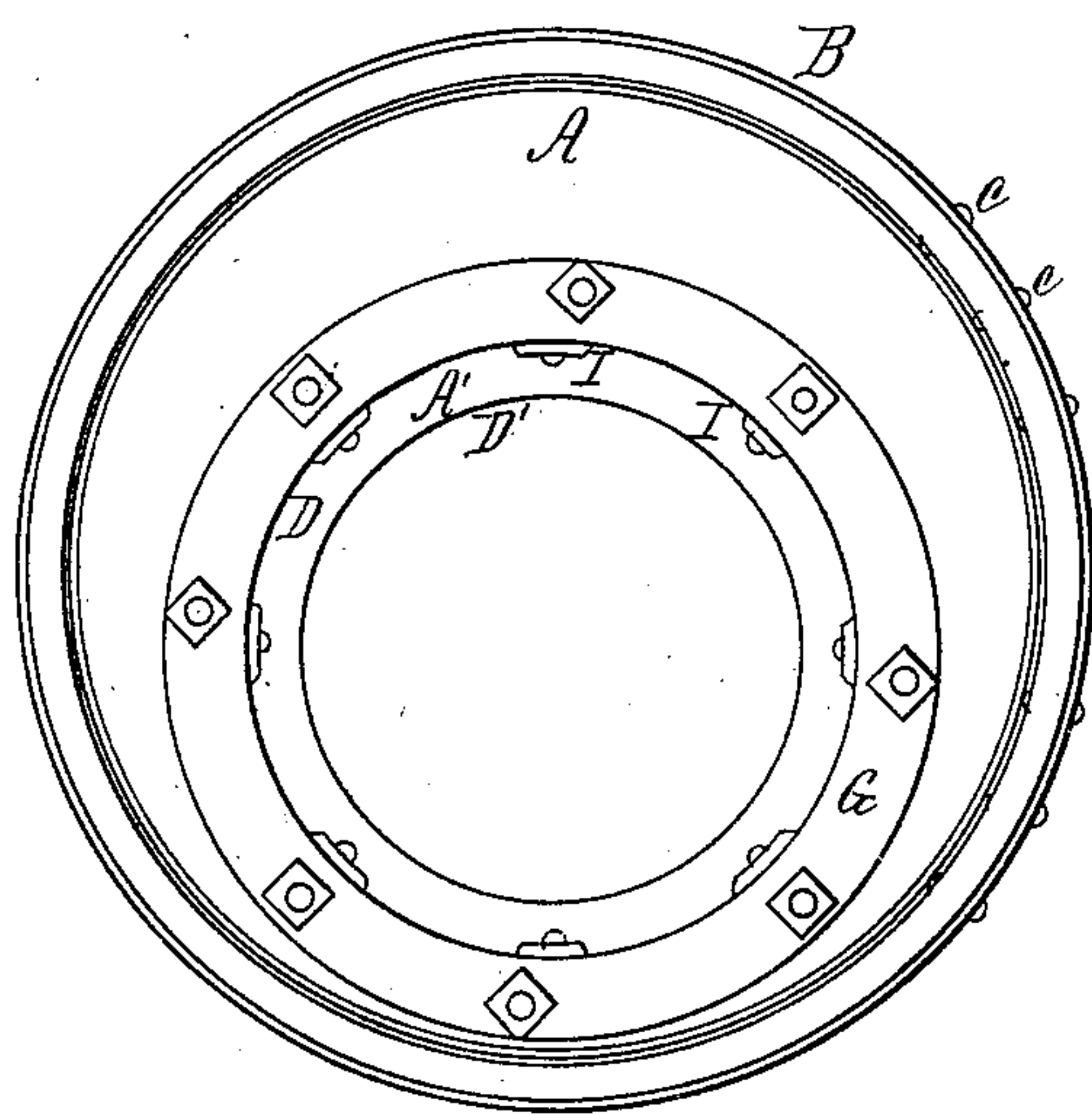
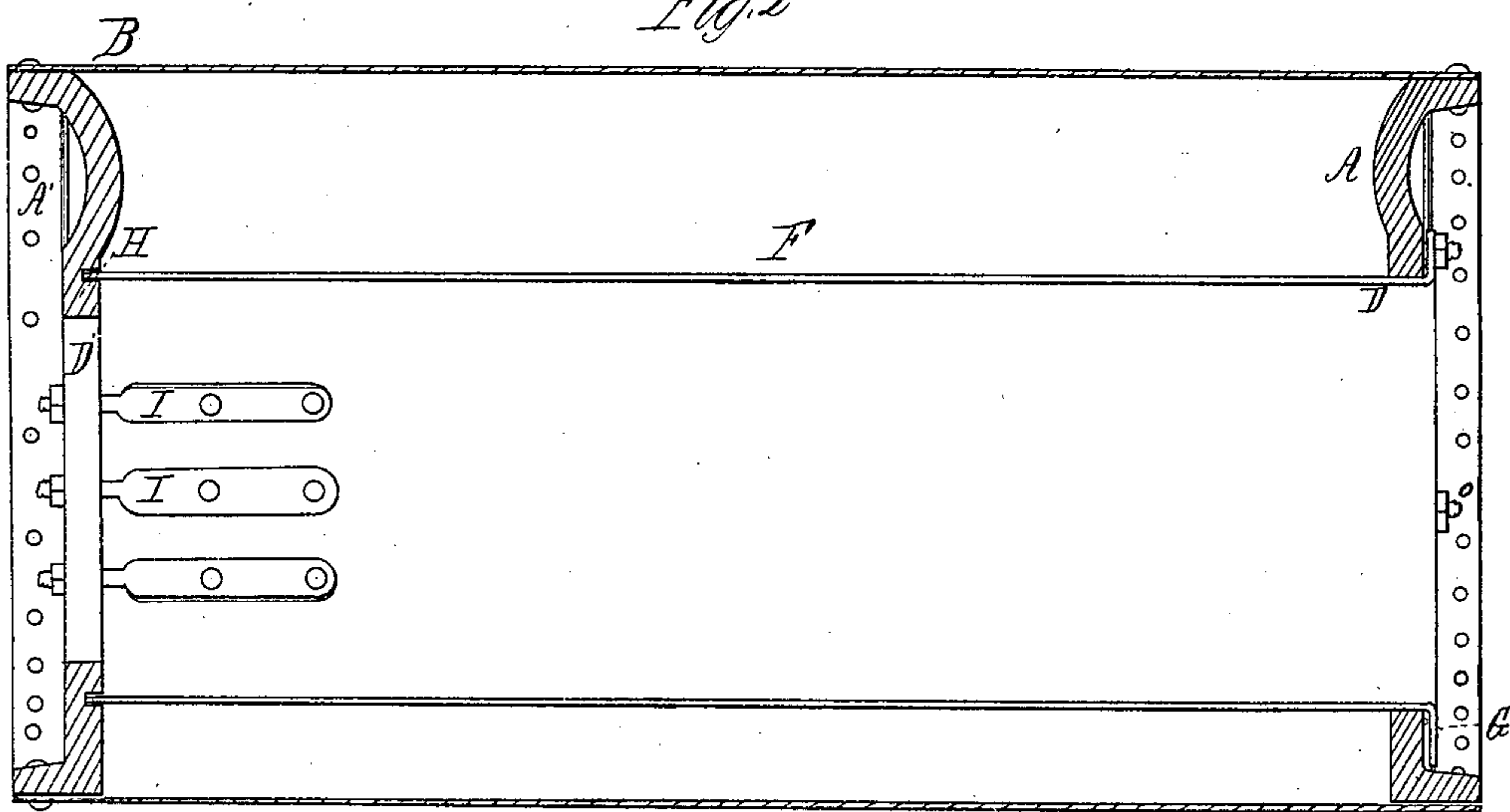


Fig. 2



UNITED STATES PATENT OFFICE.

C. B. HOARD, OF WATERTOWN, NEW YORK.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. 14,721, dated April 22, 1856.

To all whom it may concern:

Be it known that I, C. B. HOARD, of Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in the Construction of Boilers for Generating Steam; and I do hereby declare that the same are described and represented in the following specification and drawings.

To enable others skilled in the art to make and use my improvements, I will proceed to describe their construction and use, referring to the drawings, in which the same letters indicate like parts in each of the figures.

Figure 1 is an elevation of one end of a boiler with my improvements. Fig. 2 is a section of Fig. 1 cut through the center perpendicularly.

The nature of my invention consists in making an opening in one or both heads of the boiler of sufficient size to serve for a man-hole, and closing said opening by the insertion of a flue, which may be conveniently removed and replaced whenever it is desirable to clean or repair either the boiler or flue.

In the accompanying drawings, A A' are the heads or ends of the boiler, which may be made of cast metal, arching inward or convex on the inside and concave on the outside, so that they will be sufficiently strong without being unnecessarily heavy, so that they will support themselves and sustain and resist the pressure within the boiler without the aid of stays or supports of any kind.

The heads A A' are made with a flange at their peripheries, to which the outside B of the boiler is fitted and riveted, as shown in the drawings at C C. There are some openings, D and D', in the heads A A', near the lower side of the boiler, for the flue F, which is made with a flange, G, at one end, which is fitted to the head A and fastened by screws or bolts, as represented. I make a groove, H, in the head A' around the opening D' and fit the end of the flue into the groove and draw it in by means of the screw-brackets II, which are riveted to the flue F and pass through the head and are provided with screw-nuts, as shown in the drawings.

To pack the end of the flue in the groove H, a ring of copper wire (either round or triangular wire) may be laid in the groove be-

fore the end of the flue is inserted, so that by drawing the end of the flue against the wire it will be compressed and flattened, so as to pack the joint. A similar wire may be laid around the flue under the flange to pack the opposite end of the flue where it is fastened to the head A, and the hole in this head should be large enough to let the flue pass freely in and out. Whenever it is desirable to increase the fire-surface, a series of water-tubes may be inserted in the flue, which will also serve to support and strengthen the flue.

My improvements are particularly applicable to small boilers with one or more large flues, which are used for small engines on plantations, farms, machine-shops, and for driving portable saw-mills. A large majority of such engines are used where the water is impregnated with lime, chalk, or some other ingredients, which are precipitated in the boiler and form an incrustation on the inside of the boiler and around the flues, which coating or incrustation hinders the water from receiving and the boiler from yielding its heat to the water, so that a much higher degree of heat is required to generate the steam through the incrustation, rendering the boiler less efficient in generating steam, more dangerous to use, and far less durable, as the metal has to be heated so much hotter to make the supply of steam required.

Boilers of this description as heretofore constructed have had so little space in them between the flue and the outside that there has been barely room for a man to get in, and if he could get in there is not sufficient room for him to work and do the cleaning necessary; hence such boilers have been very imperfectly cleaned, if at all, which has made them burn out much sooner than they otherwise would have done.

Many years' experience in the manufacture and sale of small engines has made me familiar with the defects in the construction of boilers for such engines and the difficulties attending their use both in cleaning and making repairs, loss in the consumption of fuel, and danger of explosion, all which causes have induced me to make an effort to overcome them, which has resulted in constructing a boiler, as above described, with an opening through each head, one or both of which

may be made to serve as man-holes when the flue which closes them is removed, which can be readily done in a very short time, either to clean or repair the boiler or flue. If the flue is provided with water-tubes across its diameter, this removal of the flue is indispensable in order to clean and repair such tubes, which usually burn out much sooner than the other parts of the boiler. Besides, by removing the flue it affords ample room for a man to enter the boiler and work in it either in cleaning or repairing.

By making the heads or ends of the boiler arching inward they are far stronger in proportion to the weight of metal employed and are strong enough to support themselves without being braced, so that the cost of bracing is saved in their construction and the in-

convenience of the braces avoided in cleaning the interior.

I believe I have described the construction and use of my improvements, so as to enable any person skilled in the art to make and use the same. I will now specify what I desire to secure by Letters Patent, to wit:

What I claim as my invention, and desire to secure by Letters Patent, is—

Closing the openings or man-holes in one or both heads of boilers by the insertion of a flue, which may be conveniently removed and replaced, substantially as described.

C. B. HOARD.

Witnesses:

J. DENNIS, Jr.,

JOHN S. HOLLINGSHEAD.