

(No Model.)

2 Sheets—Sheet 1.

G. S. STRONG.

STEAM BOILER.

No. 382,061.

Patented May 1, 1888.

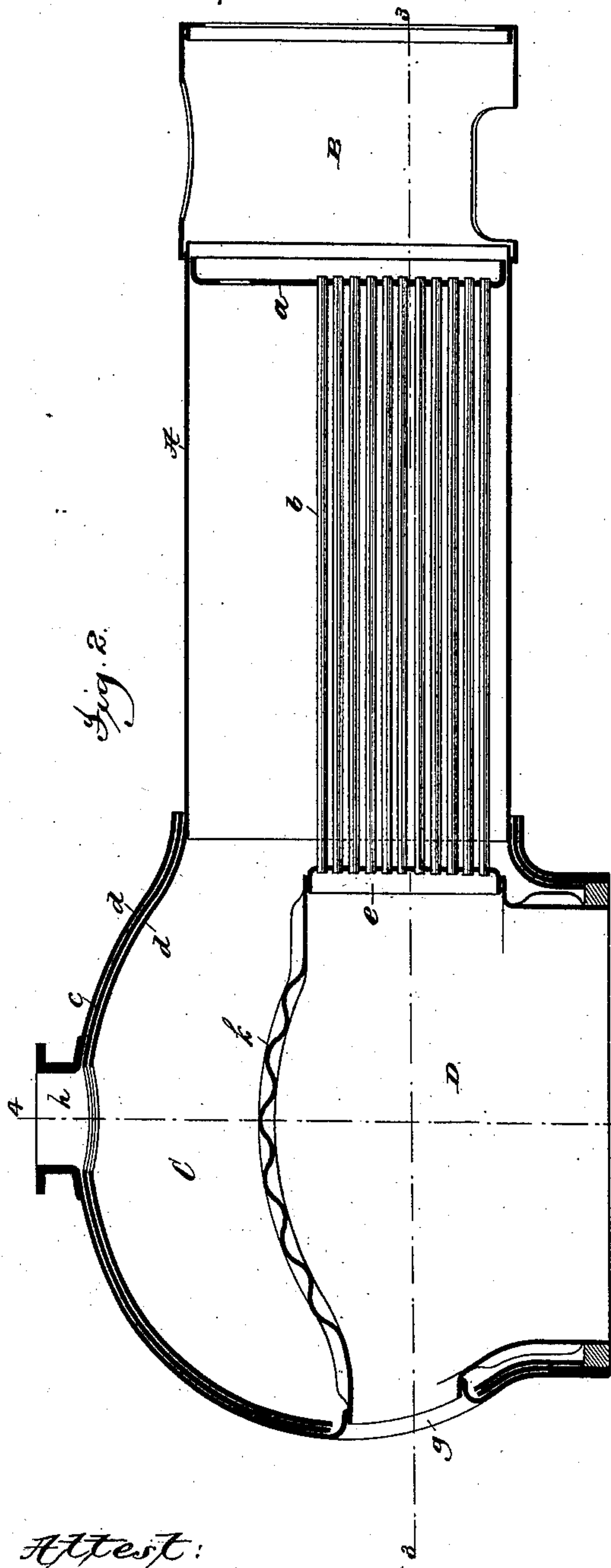


Fig. 2.

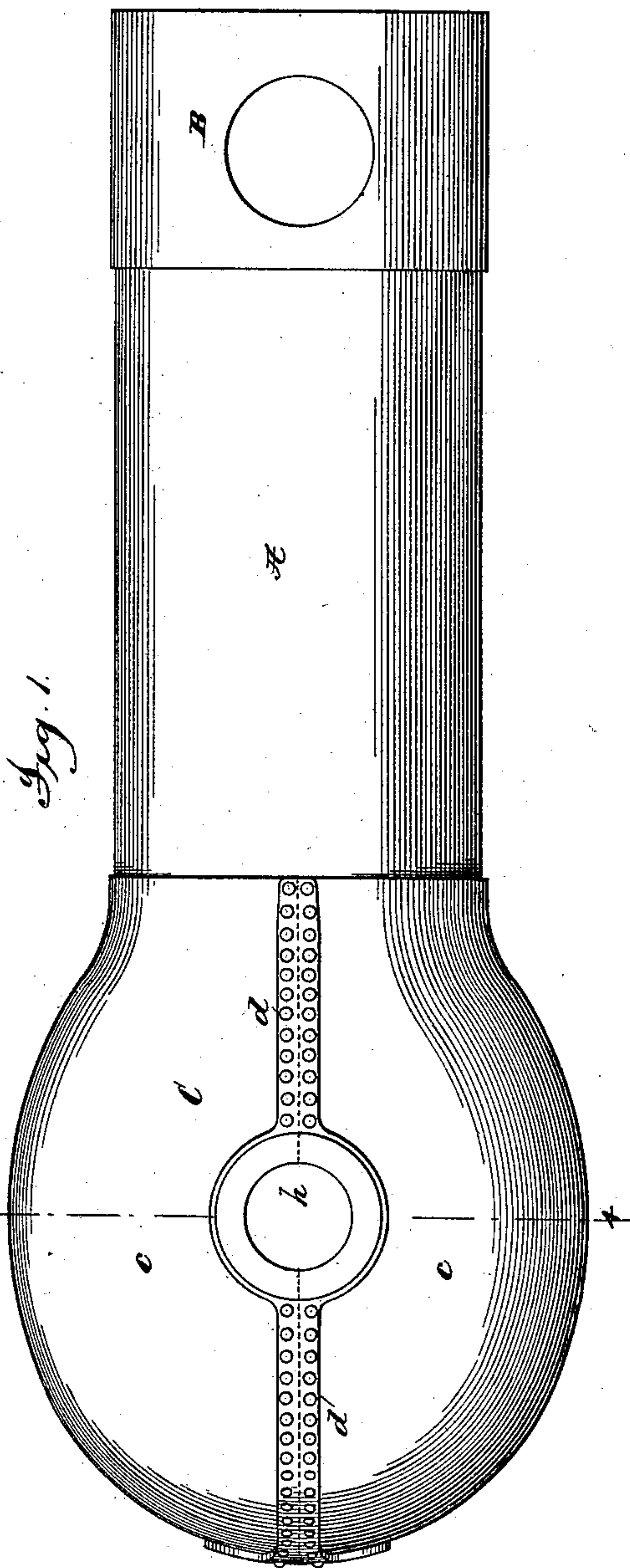


Fig. 1.

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by Philip Phelps Hovey.
Attys:

(No Model.)

2 Sheets—Sheet 2.

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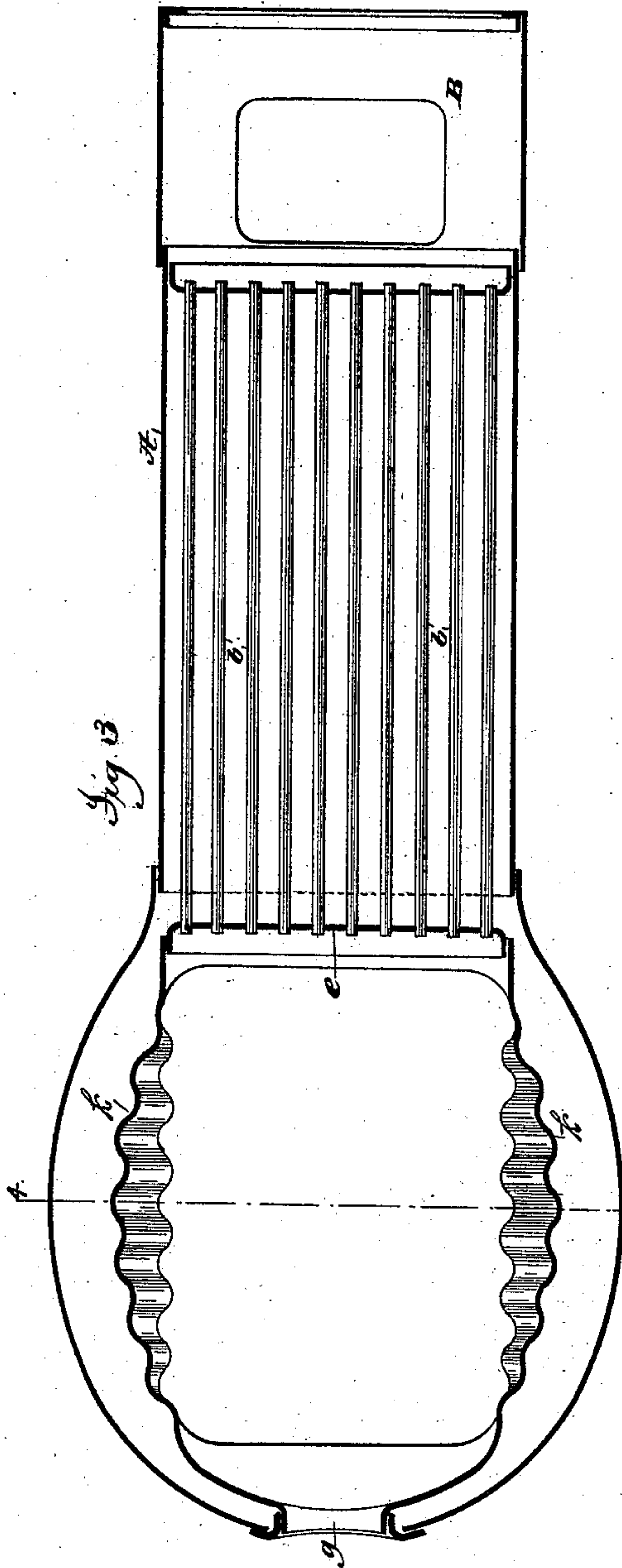


Fig. 3.

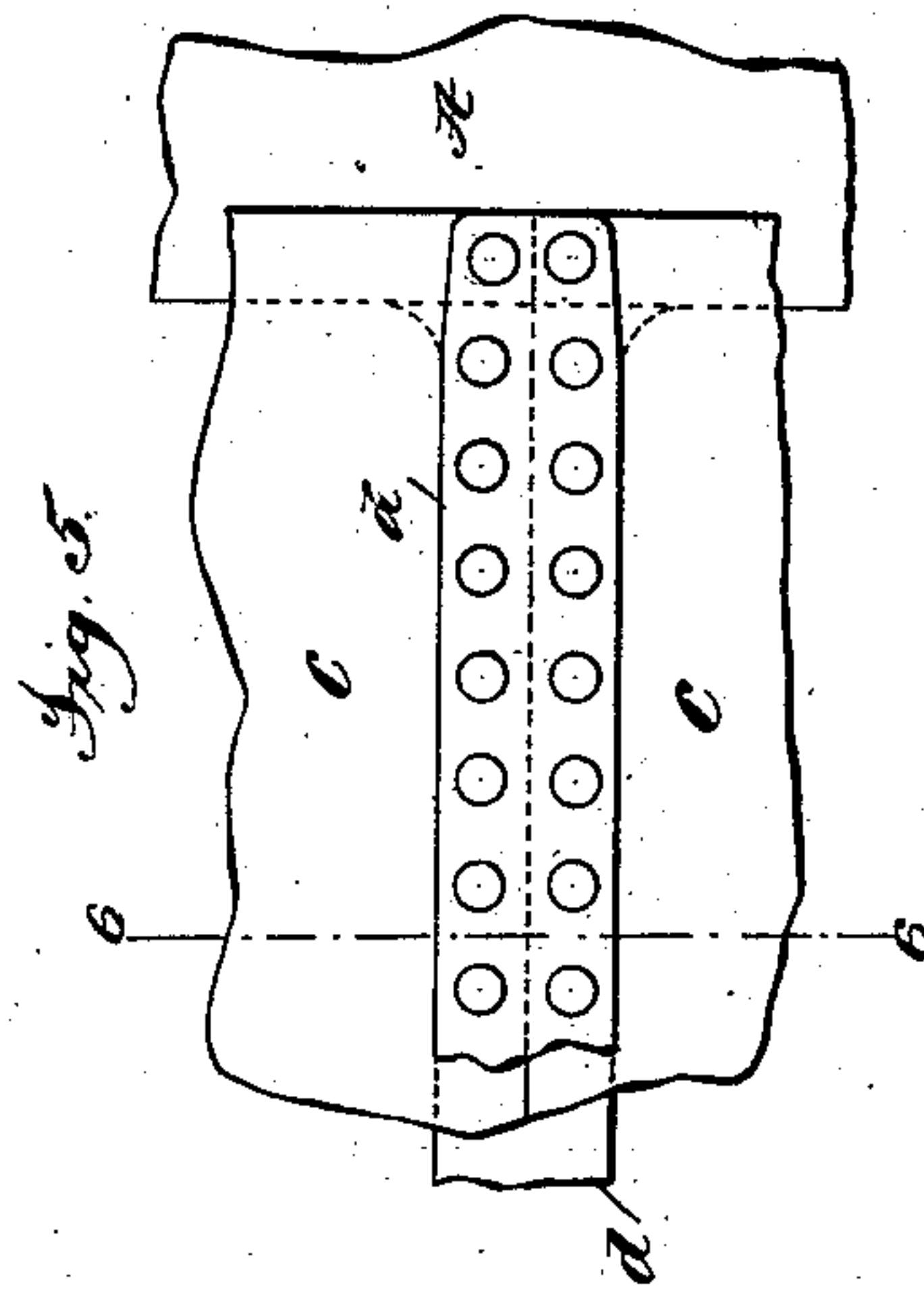


Fig. 5.

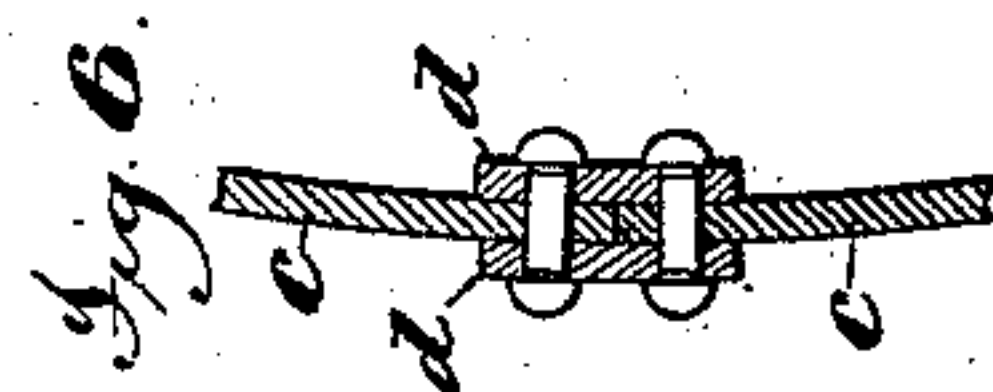


Fig. 6.

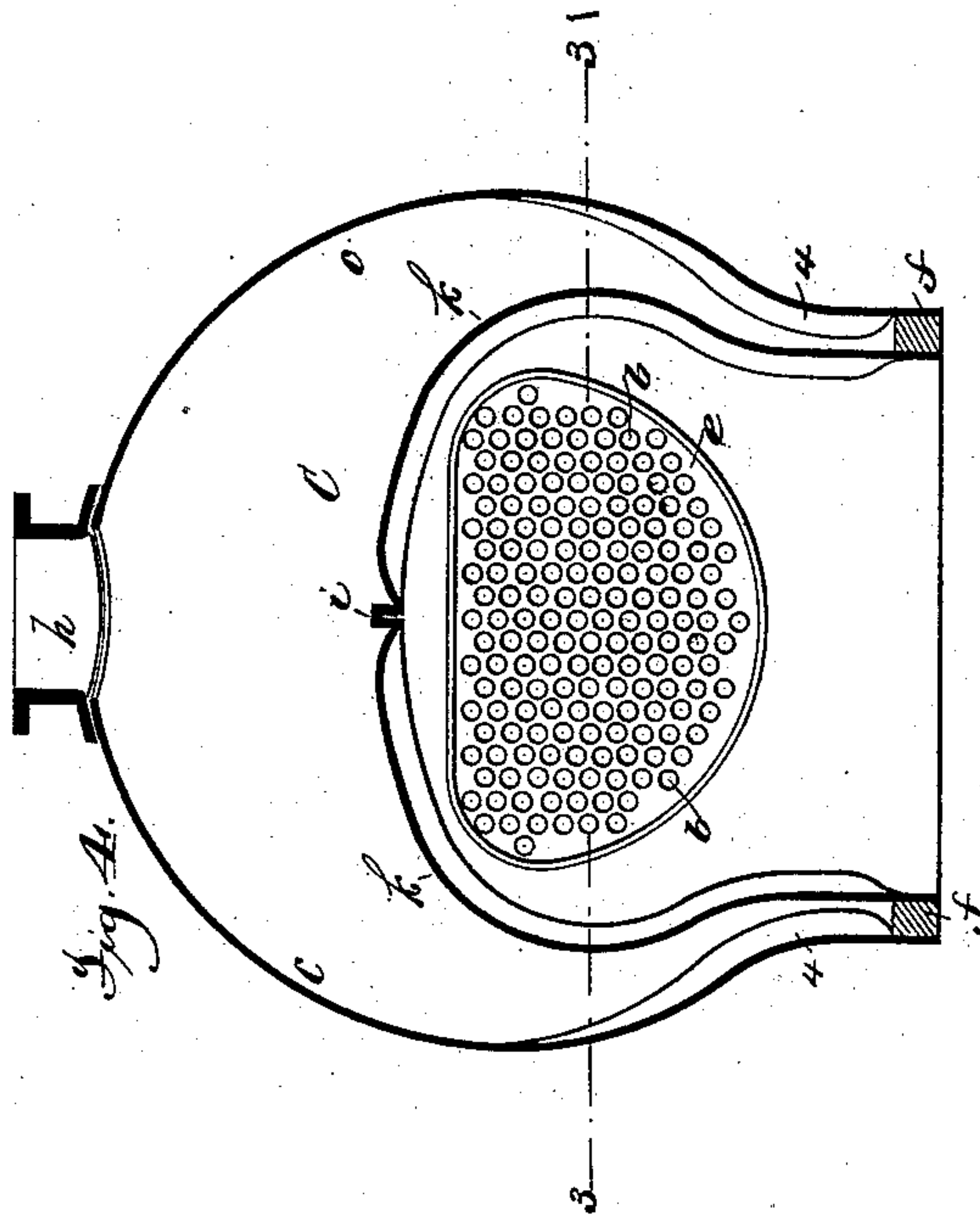


Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE S. STRONG, OF NEW YORK, N. Y.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 382,061, dated May 1, 1888.

Application filed October 31, 1887. Serial No. 253,803. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. STRONG, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Steam-Boilers, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates, generally, to the construction of steam-boilers, but more particularly to a boiler which is especially designed and adapted for use in connection with locomotive and portable engines.

It is the object of the invention to secure economy and simplicity in the construction of the boiler, and at the same time make the boiler of such form and so distribute the material as to secure great durability and strength.

As a full understanding of the invention can only be imparted by an illustration and a detailed description of a boiler embodying the same, all preliminary description will be omitted and a full description given, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view, and Fig. 2 a central longitudinal vertical section, of a boiler constructed according to the present invention. Fig. 3 is a horizontal section taken on the line 3 of Figs. 2 and 4. Fig. 4 is a vertical cross-section taken on the line 4 of Figs. 1, 2, and 3. Fig. 5 is an enlarged view of a portion of Fig. 1, showing the manner of uniting the two parts which form the shell of the furnace end of the boiler; and Fig. 6 is a cross-section taken on the line 6 of Fig. 5.

Referring to said figures, it is to be understood that the forward part, A, of the boiler, or what may be termed the "boiler proper," is of cylindrical form, and is constructed of iron plates riveted or welded together in the usual manner. The forward end of this cylindrical portion is closed by a head-plate, *a*, in which are set the usual flue-tubes, *b*, which open at their forward ends into the space B, which communicates with the smoke-stack.

The rear or furnace portion, C, of the boiler is composed of two plates, *c*, which are struck up or forged to approximately hemispherical form, so that each forms one-half of this por-

tion of the boiler. The plates *c* being of this form, the sides of this portion of the boiler swell or curve outward in horizontal section, as shown in Figs. 1 and 3, while the top and sides swell or curve upward and outward in vertical section, as shown in Figs. 2 and 4, thus making this portion of the boiler of approximately spherical form. These plates *c* are brought together and united at their meeting edges by means of seam-plates *d*, which are placed upon opposite sides of the seam and united to each other and the plates *c* by riveting. The lower edges of the plates *c* are provided with vertical corrugations 4, as best shown in Fig. 4, which extend upward and vanish at a point about midway the height of the boiler. These corrugations add greatly to the strength of the structure. The plates *c* are secured at their lower edges to a hoop, *f*, which forms the base of the boiler and the furnace. The plates *c* are properly shaped at their forward edges to unite with and form a continuation of the cylindrical portion A of the boiler, and at their rear edges are cut away to form an opening, *g*, for the door of the furnace. These plates are also cut away at their meeting edges to form an opening, *h*, which communicates with the steam-dome.

Located on the lower part of the portion C of the boiler is the fire space or furnace D, which is inclosed by two plates, *k*, which rise from the hoop *f*, and are properly shaped so that their edges meet at the top of the furnace, as shown at *i*, where they are united, thus forming an arch over the furnace. The forward edges of the plates *k* unite with a plate, *e*, which receives the rear ends of the flue-tubes *b*, which communicate with the furnace. The plates *k*, composing the sides and roof of the furnace, are corrugated vertically, as indicated, thus forming a compound arch, so as to give them great strength and enable them to withstand without the aid of stays the pressure of the steam when highly heated. From this it will be seen that the entire furnace end of the boiler is composed of four plates, together with theseamed plates for uniting them, the two plates *c* forming the entire outer portion of this end of the boiler, while the two plates *k* form the inner end of this part or the sides and roof of the furnace. By this means

the construction is rendered exceedingly simple, thus making the boiler economical to manufacture, and the number of seams required is reduced to the minimum, thus reducing the liability of leakage by reason of imperfect seams.

By making the portion C of the boiler of the approximately spherical form described the material is so disposed as to secure the maximum strength, the strain due to internal pressure being when the boiler is of this form almost entirely a tensile strain as distinguished from a bending strain.

What I claim is—

1. The herein-described steam-boiler, consisting of the cylindrical portion A, the approximately spherical furnace portion C, and the vertically-corrugated arched portion K, forming the roof to the furnace, substantially as described.

2. The herein-described steam-boiler, con-

sisting of the cylindrical portion A and the approximately spherical furnace portion C, the latter being formed of the two plates *c*, struck up to approximately hemispherical form and united at their meeting edges, substantially as described.

3. The combination, with the cylindrical portion A, of the approximately spherical portion C, formed of the two plates *c*, struck up to approximately hemispherical form and united at their meeting edges, and the vertically-corrugated arched plates *k*, forming the roof to the furnace, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE S. STRONG.

Witnesses:

T. H. PALMER,
J. J. KENNEDY.