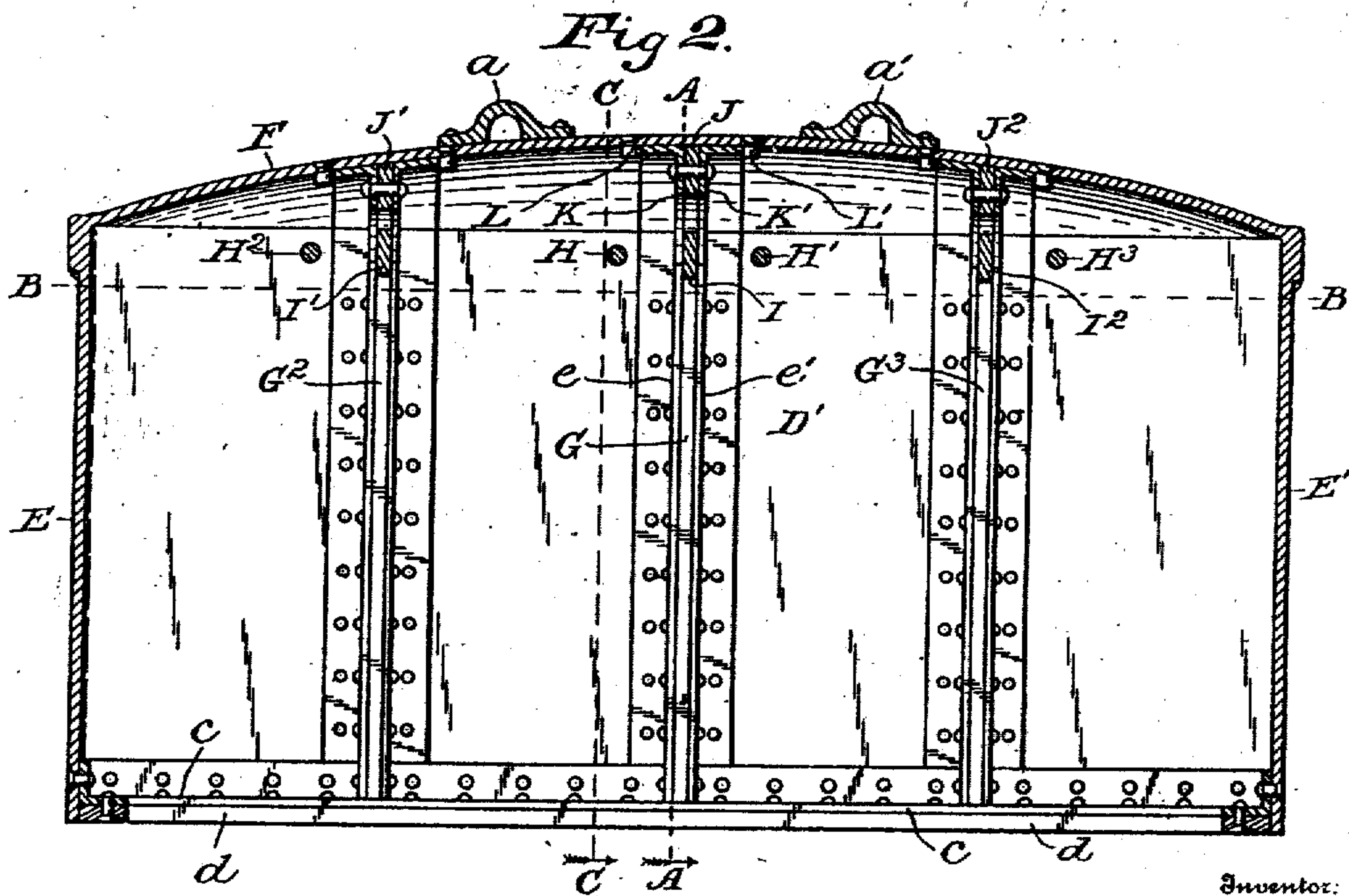
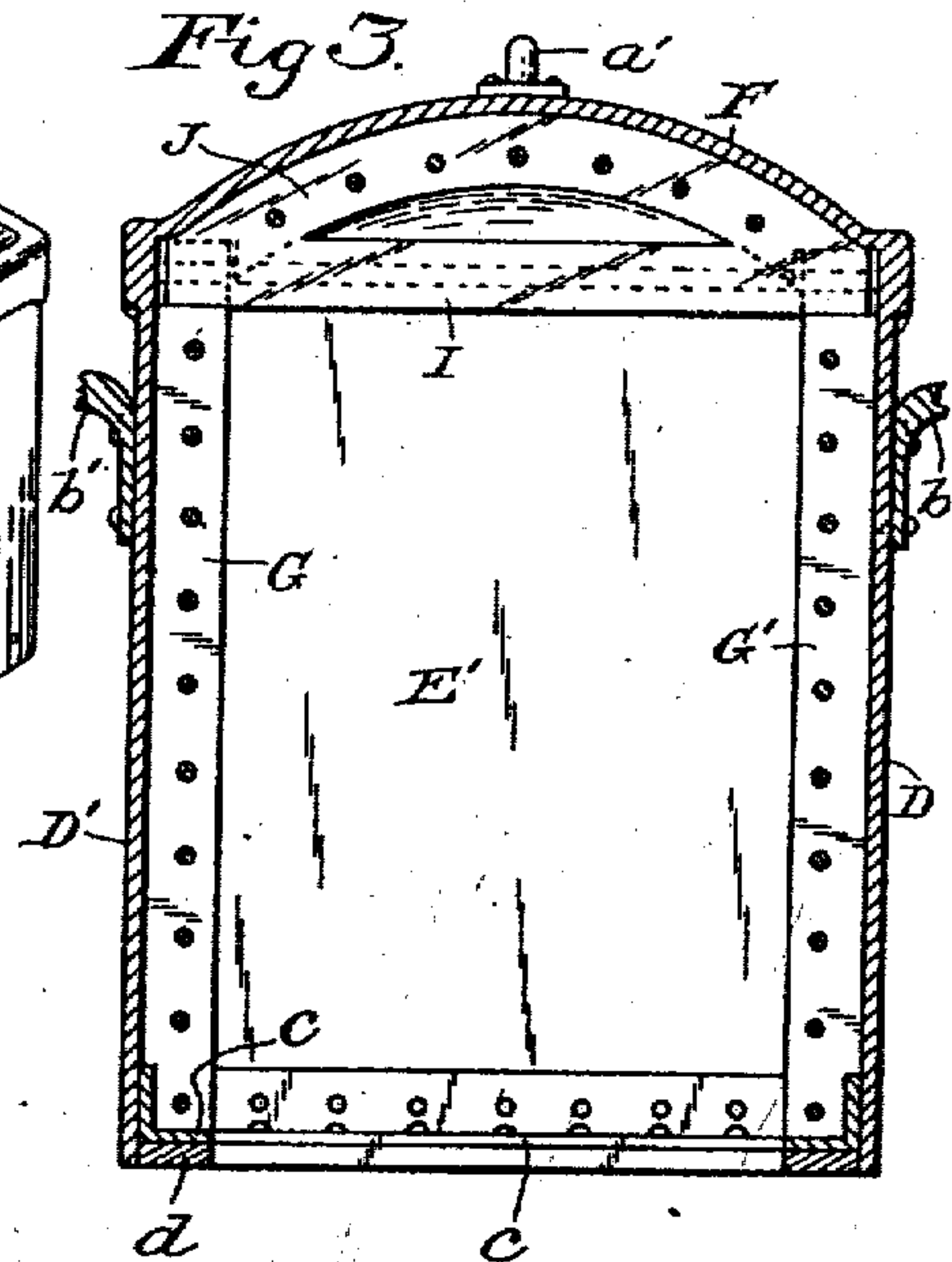
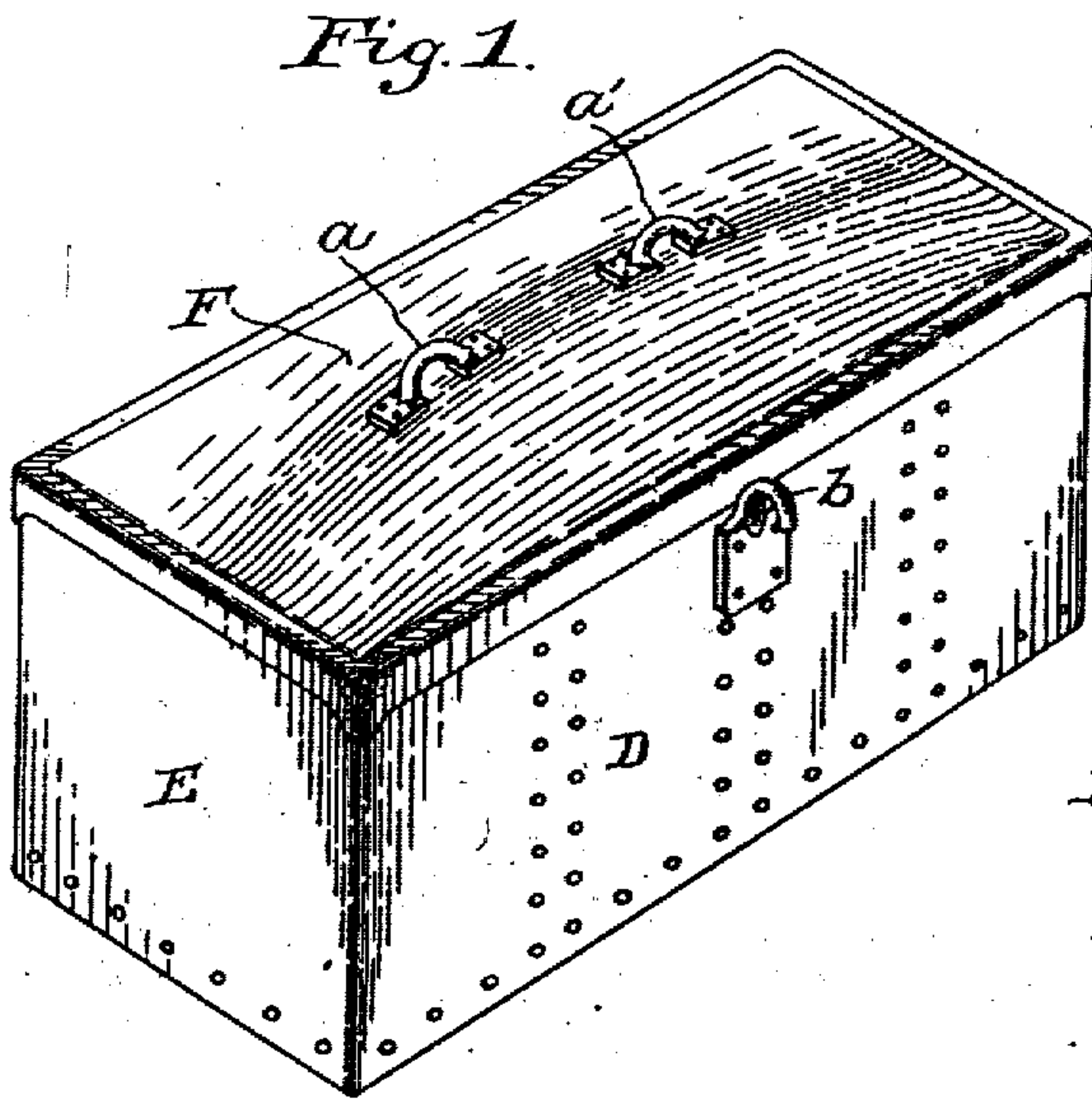


J. J. MARKEY.
ANNEALING BOX.

APPLICATION FILED OCT. 23, 1905.

2 SHEETS—SHEET 1.



Witnesses:

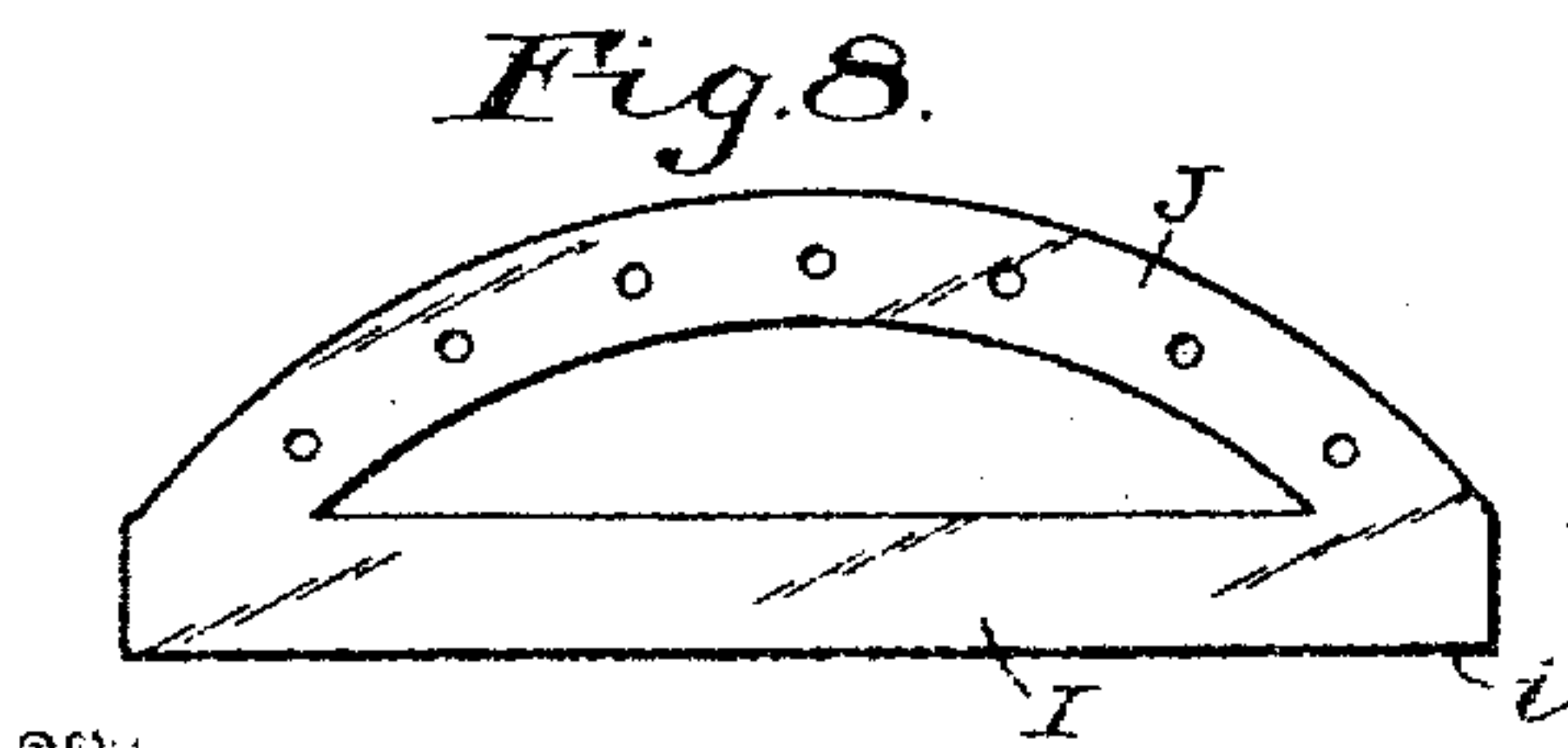
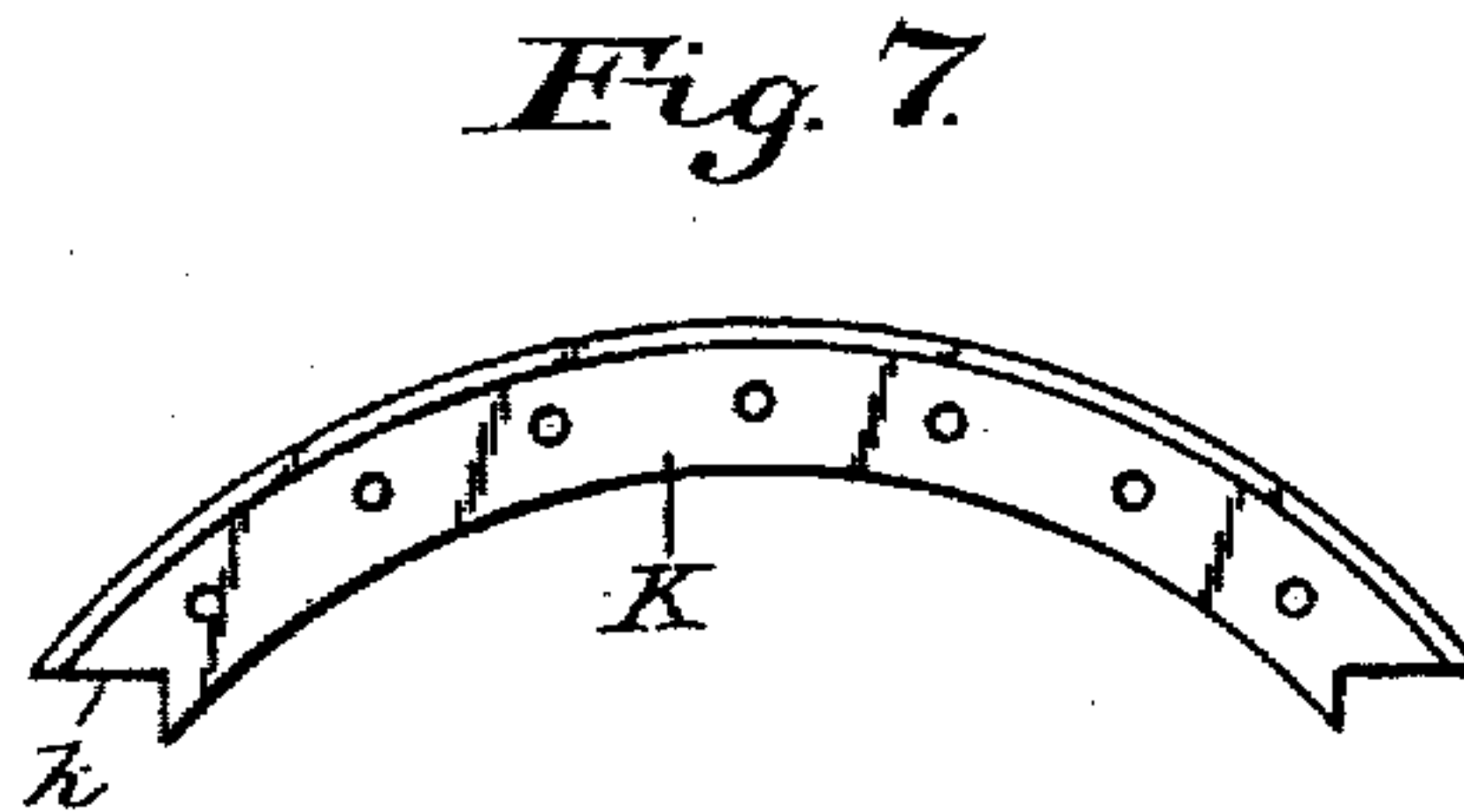
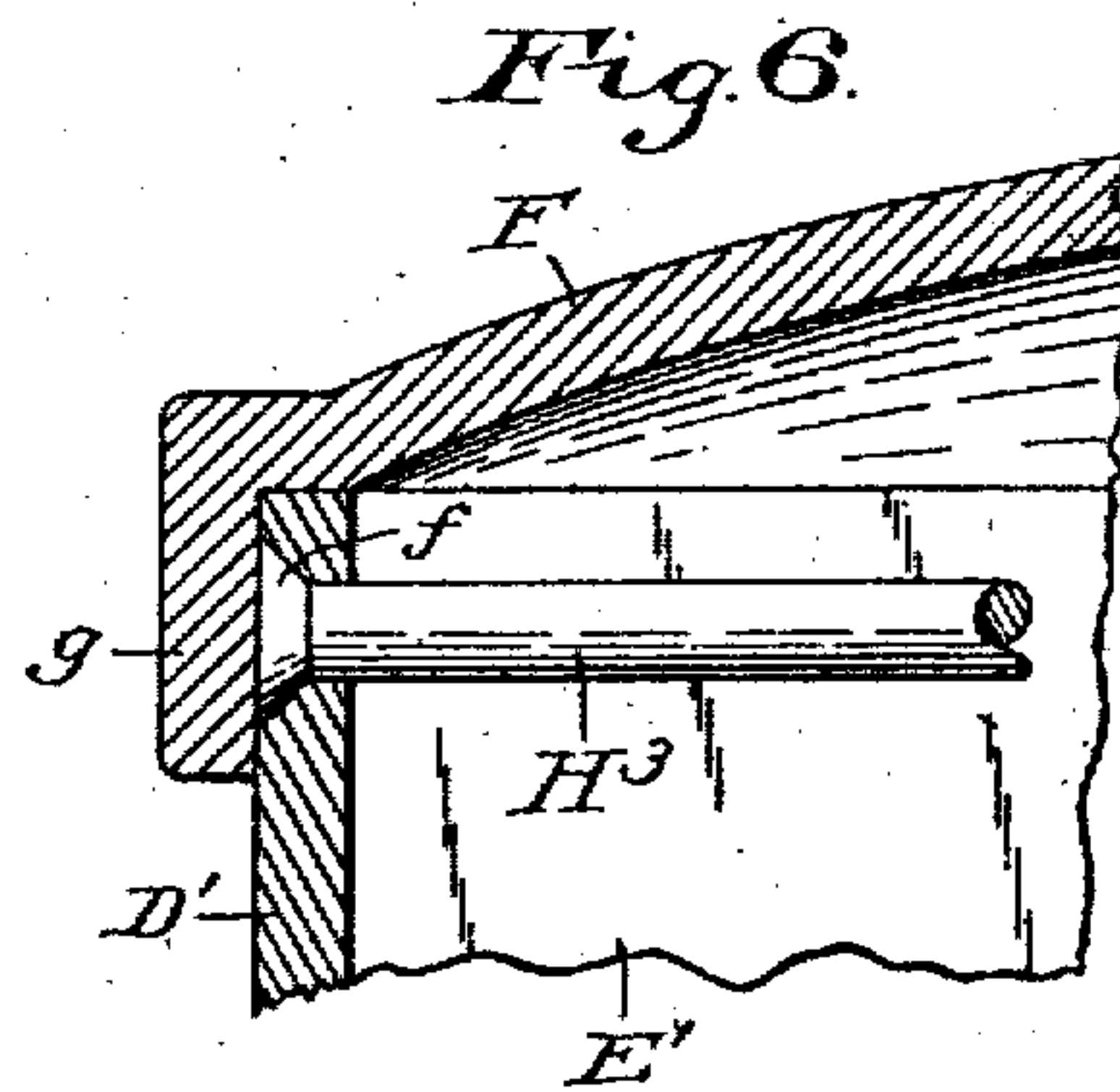
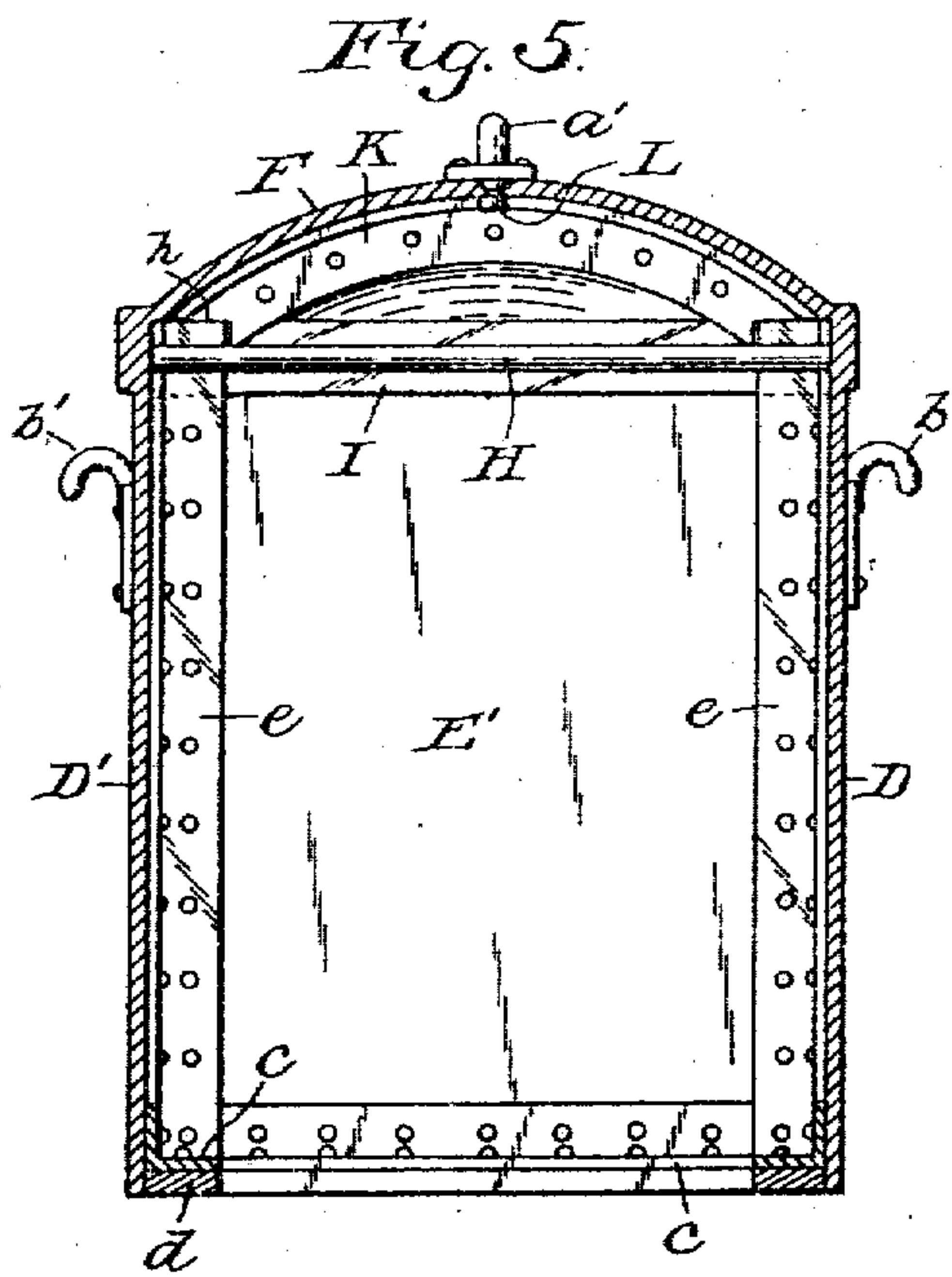
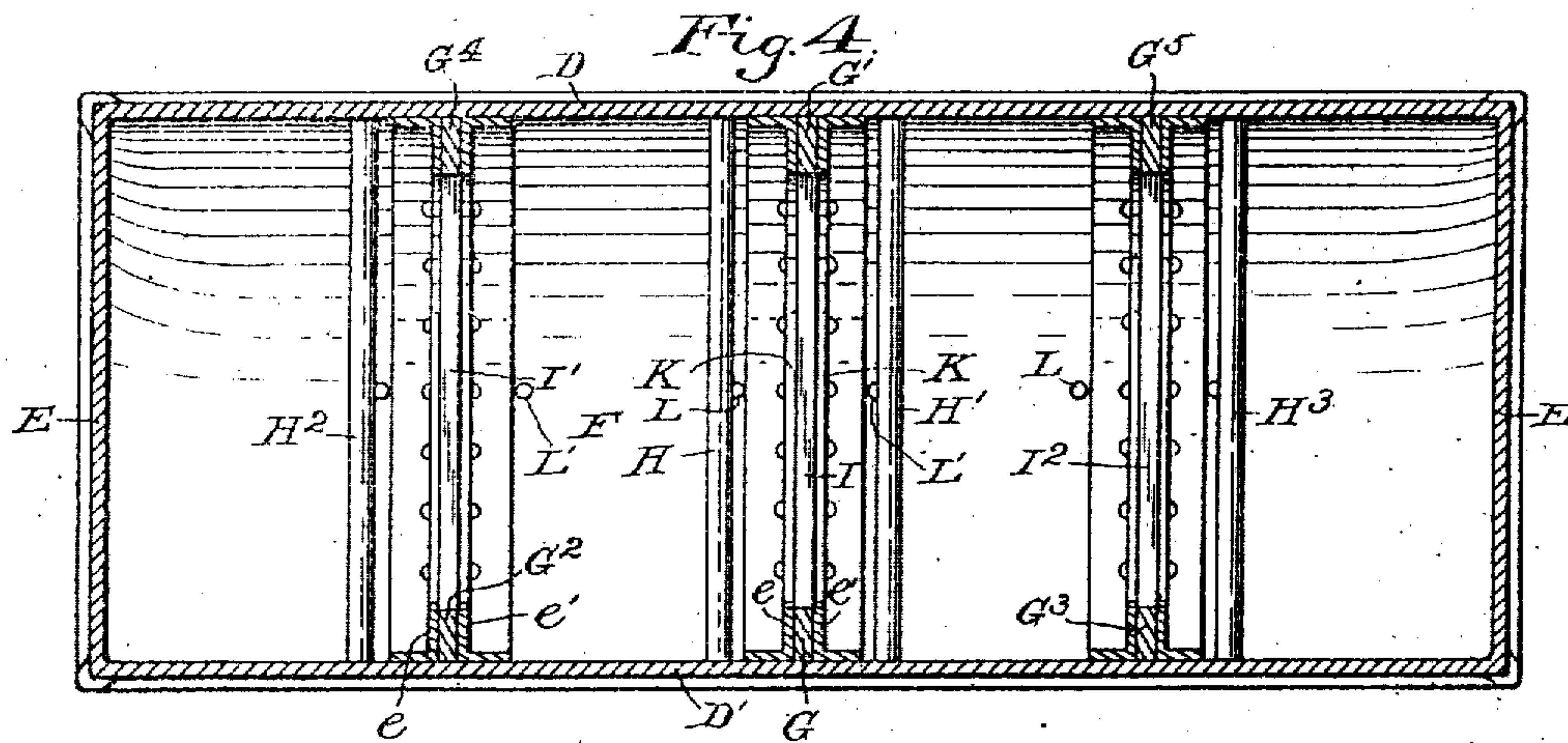
R. D. Fisher
Stella Snider

Inventor:
by John J. Markey,
E. J. Silvius,
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE

JOHN J. MARKEY, OF ANDERSON, INDIANA.

ANNEALING-BOX.

No. 812,943.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed October 23, 1905. Serial No. 284,020.

To all whom it may concern:

Be it known that I, JOHN J. MARKEY, a citizen of the United States, residing at Anderson, in the county of Madison and State of Indiana, have invented new and useful Improvements in Annealing-Boxes; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to sheet-metal-annealing boxes of the class that are used in sheet-mills and tin-plate mills in annealing sheets of metal; and the invention has particular reference to the part that is designed to be placed upon a stand to cover the sheets while being heated and then slowly cooled in the annealing process.

The objects of the invention are to provide a sheet-metal-annealing box that may be relied on to hold its shape under the severe service to which such articles are necessarily subjected, to provide an annealing-box that in particular will have a top which when heated to the highest degree in use will not sag of its own weight, and therefore will not cause the sides of the box to bulge outwardly, and to provide a construction whereby sheet-metal-annealing boxes may be rendered more durable and economical than those heretofore in use.

With the above-mentioned and minor objects in view the invention consists in a novel built-up sheet-metal-annealing box having a crowning or arched top provided with novel arches for the support thereof, the box being provided with tie-rods that are welded to the sides and top part of the box and also having posts for the direct support of the arches and tie-bars for the arches; and the invention consists, further, in the novel parts and the combinations and arrangements of parts, as hereinafter particularly described and claimed.

Referring to the drawings, Figure 1 is a perspective view of an annealing-box constructed in accordance with the invention and adapted to be placed upon a stand; Fig. 2, a longitudinal vertical sectional view of the box; Fig. 3, a transverse sectional view of the box on the broken line A A in Fig. 2; Fig. 4, an inverted horizontal sectional view on the broken line B B in Fig. 2; Fig. 5, a transverse sectional view on the broken line

C C in Fig. 2; Fig. 6, a fragmentary transverse sectional view showing the manner of attaching the tie-rods to the box; Fig. 7, an elevation of a side part of the arch for supporting the top of the box, and Fig. 8 an elevation of the central or main part of the arch. Similar reference characters in the several figures of the drawings designate corresponding elements or features.

In a practical embodiment of the invention the improved box comprises a body composed of two sides D and D' and two ends E and E', which may be formed suitably of one sheet of metal for a small box and two sheets of iron or steel welded at corners for a large box, and a crowning-top F, formed separately of a sheet of metal and welded to the sides and ends. A pair of lifting-eyes a and a' are attached to the top F, and a pair of hooks b and b' are attached to the sides of the box; but in some cases either the eyes or the hooks only may be provided. The bottom of the box is open; but the lower edge of the box is provided with a reinforcing inner flange c, of angle-iron, riveted to the sides and ends of the box, and a relatively thick frame d, riveted to the under side of the angle-iron flange, reinforcing the flange and the lower edge of the box.

A pair of heavy metal posts G and G' are arranged against the sides D and D' midway between the ends of the box and extend from the horizontal flange c of the angle-iron nearly to the upper end of the box-body, leaving a space between the tops of the posts and the top F. The posts are each riveted to angle-irons e and e' at either side of the post, and the angle-irons are riveted to the sides D and D' of the box-body. A pair of posts G² and G⁴ are arranged in one end portion of the box, and a pair of posts G³ and G⁵ are arranged in the other end portion of the box, there being angle-irons riveted to the posts and the sides of the box-body, as above mentioned. All of the posts are alike in height and similarly connected to the box-body. The angle-irons are all of the same height, and they extend somewhat higher than the posts, preferably to the under side of the top F where it joins the box-body. In some cases either a lesser number or a greater number of pairs of posts may be provided, the number depending upon the dimensions of the box. The posts are designed to di-

rectly support the arches for the top of the box, so as to avoid weighting and crushing the sides when hot, and they also assist in stiffening the sides of the box.

5 A suitable number of tie-rods, as H H' H'' H''' , extend across the upper portion of the box-body, and the ends of the tie-rods are welded to the sides D and D' of the box-body. In this construction the upper portions of the
10 box sides are first perforated to receive the ends of the tie-rods, and the perforations are countersunk at the outer ends thereof. The tie-rods extend through the sides of the body and are upset while hot in the countersunk
15 perforations, so as to form heads f . The top F has its edges turned down, so as to form a flange g about the upper end of the box-body and covering the heads of the tie-rods. The upper edge of the box-body, the ends of the
20 tie-rods and the flange g are then heated sufficiently and welded together, so as to become practically integral parts, so that there may be no projecting tie-rod heads or nuts at the outside of the box to become burned off
25 and rendered useless.

A suitable number of supports for the crowning-top F are provided, each support comprising a tie-bar I , I' , or I'' and an arch member J , J' , or J'' , that is attached at its
30 ends to the ends of the tie-bar, the ends being preferably welded together when the arch and the tie-bar are formed of wrought metal; but in some cases the two elements may be formed integrally of cast metal, and in some
35 cases the tie-bars may be omitted in the construction. Each arch member, as J , has a pair of side members K and K' , riveted to opposite sides thereof, the side members being composed of angle-iron having each a bearing
40 end h at each end thereof resting upon the top of an angle-iron e or e' , and the ends i of the arch member, as J , rest on a pair of posts, as G and G' , between the upper end portions of a pair of angle-irons e and e' . The ends of
45 the arch members preferably do not bear against the sides of the box-body, so that the arches may expand longitudinally. The tops of the arches bear against the top F , but preferably are not attached or secured thereto, the arches being held in place laterally by
50 the flanges e and e' and prevented from tilting, partially by guide-studs L and L' , attached to the top F , and partially by the lateral flanges of the side members of the arches, the flanges e and e' providing broad bearing-
55 surfaces for the arches against the top F .

Various slight modifications may be made in welding the tie-rods to the box-body and also as to the exact positions of the junctions
60 of the arch members with the posts and their attached angle-irons within the scope of the invention.

In practical use a stand, as will be understood, will be used on which plates of metal
65 will be piled to be annealed. Then the box

will be placed upon the stand and cover the plates of metal, sand will be placed about the bottom of the box on the stand, and then the whole will be placed in a furnace to be heated. The top F will become heated at first to a
70 higher degree than other portions of the box and will consequently expand more or less before the arches and tie-bars and tie-rods become heated within the box sufficiently to elongate, and inasmuch as the tie-rods will
75 prevent the expanding top from spreading the box sides, the top will rise centrally above the arches without hindrance. The arches will next become heated and expand in advance of the tie-rods, first rising centrally and
80 then as the heat is communicated to their tie-bars the latter will elongate without straining the tie-rods, as H . Finally at the maximum temperature the top F will be the hotter part and will be unable to support itself and will
85 then be supported by the strong arches without buckling or losing its symmetrical shape, and the arches being supported by the posts will relieve the box sides while hot of the weight of the top F , so that the upper por-
90 tions of the sides cannot be buckled, as heretofore. At the proper time the stand, box, and contents will be withdrawn from the furnace and slowly cooled, as will be understood. When the top F becomes burned and
95 deteriorates from the excessive and repeated heatings, it may be cut off and a new top may be welded to the bottom of the box-body, the tie-rods being cut out and new ones applied.

Having thus described the invention, what
100 is claimed as new is—

1. An annealing-box provided with an arch in the interior thereof, supports for the arch, and a box-top on the arch unattached thereto and attached to the body of the box.
105

2. An annealing-box including sides and ends, and a crowning or arched top part on the sides and ends attached thereto and provided with a tie-rod attached to the top part and also to the sides.
110

3. An annealing-box having a top provided with a supporting-arch unattached thereto and free to expand longitudinally in the box, the arch being normally in contact with the box-top, a tie-rod attached to the
115 sides of the box and extending across the interior of the box at the upper portion thereof, and supports for the arch.

4. An annealing-box having a top provided with a supporting-arch unattached
120 thereto and comprising a main member and also a pair of side members secured to the main member and having each a lateral flange, supports for the arch, and a tie-rod extending across the interior of the box and
125 having the ends thereof welded to the sides of the box.

5. An annealing-box having a crowning-top and provided with a pair of posts in the interior thereof, means for connecting the
130

posts with the sides of the box, a tie-rod extending across the interior of the box and welded to the sides thereof, and an arch resting upon the pair of posts and normally in contact with the top of the box but unattached thereto.

6. An annealing-box having a crowning-top and provided with a pair of posts in the interior thereof, means for connecting the posts with the sides of the box, a tie-rod extending across the interior of the box and attached to the sides thereof, the tie-rod having heads hidden in the side walls, an arch resting on the pair of posts and normally in contact with the top of the box but unattached thereto, and a tie-bar attached to the ends of the arch.

7. An annealing-box including sides and ends, a tie-rod welded to the sides of the box, and a top part on the sides and ends of the box and having flanges welded to the tie-rod.

8. In an annealing-box, the combination with the sides thereof having a frame connected to the bottom thereof, and with angle-irons secured to the inner sides of the box sides, of a pair of posts extending substantially from the frame between pairs of the angle-irons and secured thereto, the tops of the posts being below the plane of the tops of the angle-irons, an arch resting upon the tops of the posts between angle-irons, and a tie-rod attached to the sides of the box, the

box having a top supported by the arch but unattached thereto.

9. In an annealing-box, the combination with the sides and the top thereof, of posts supported in the box against the sides thereof, an arch mounted on the posts and extending under the top of the box but unattached thereto, and guide-studs attached to the top of the box and projecting at opposite sides of the arch.

10. In an annealing-box, the combination of two side parts and a crowning or arched top part and also a tie-rod therefor, all welded together, an arch for supporting the top part, supports for the arch connected with the side parts, and end parts attached to the side parts and the top part.

11. In an annealing-box, the combination of two side parts and connected end parts, a tie-rod extending through the side parts, a crowning or arched top part on the side parts and end parts, and having flanges extending over the ends of the tie-rods, an arch for supporting the top part, supports for the arch, and lateral supports for the arch.

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

JOHN J. MARKEY.

Witnesses:

WM. H. PAYNE,

E. T. SILVIUS.