

(No Model.)

2 Sheets—Sheet 1.

J. G. ILS.
PORTABLE ASSAY FURNACE.

No. 606,149.

Patented June 21, 1898.

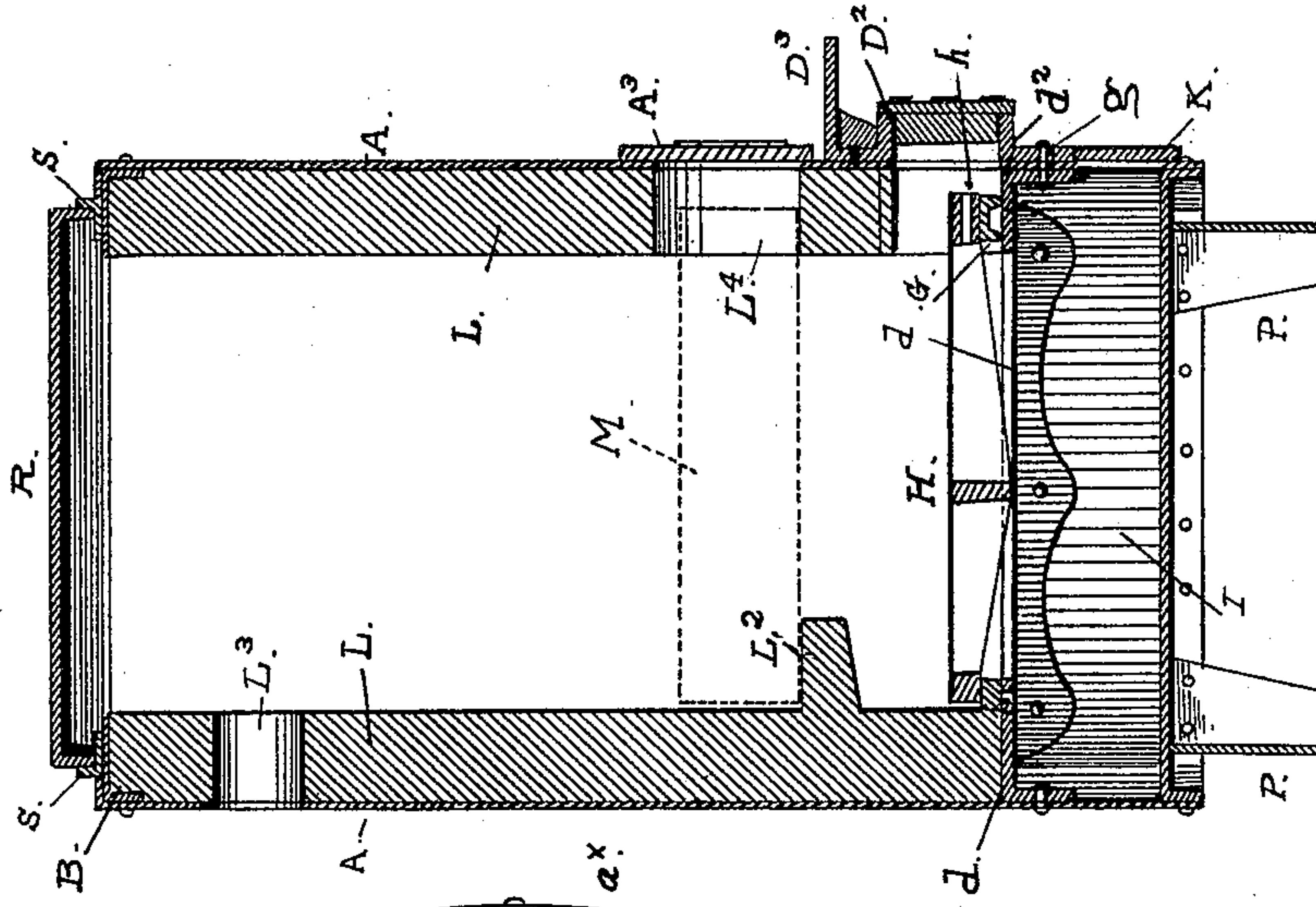


Fig. 2.

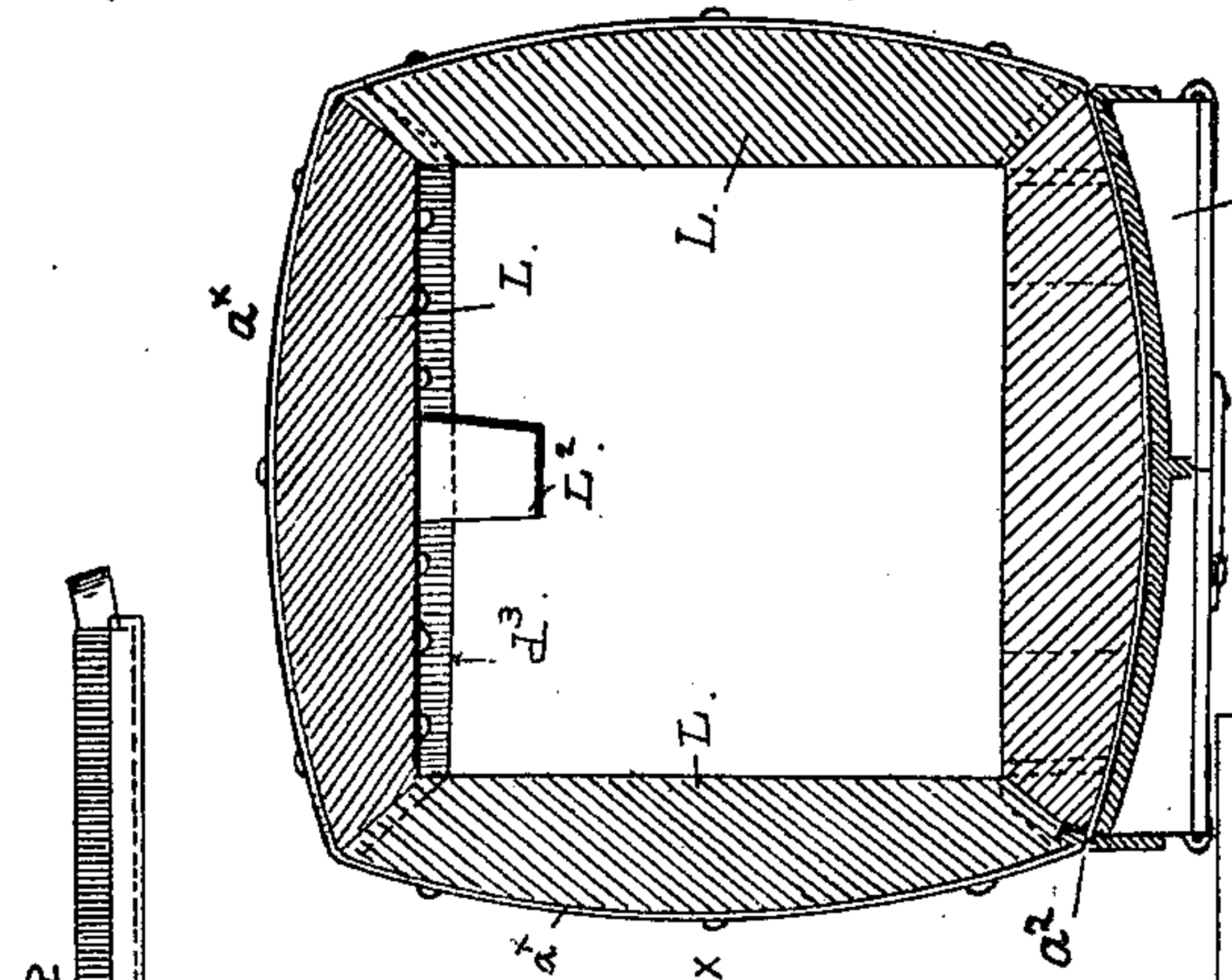


Fig. 3.

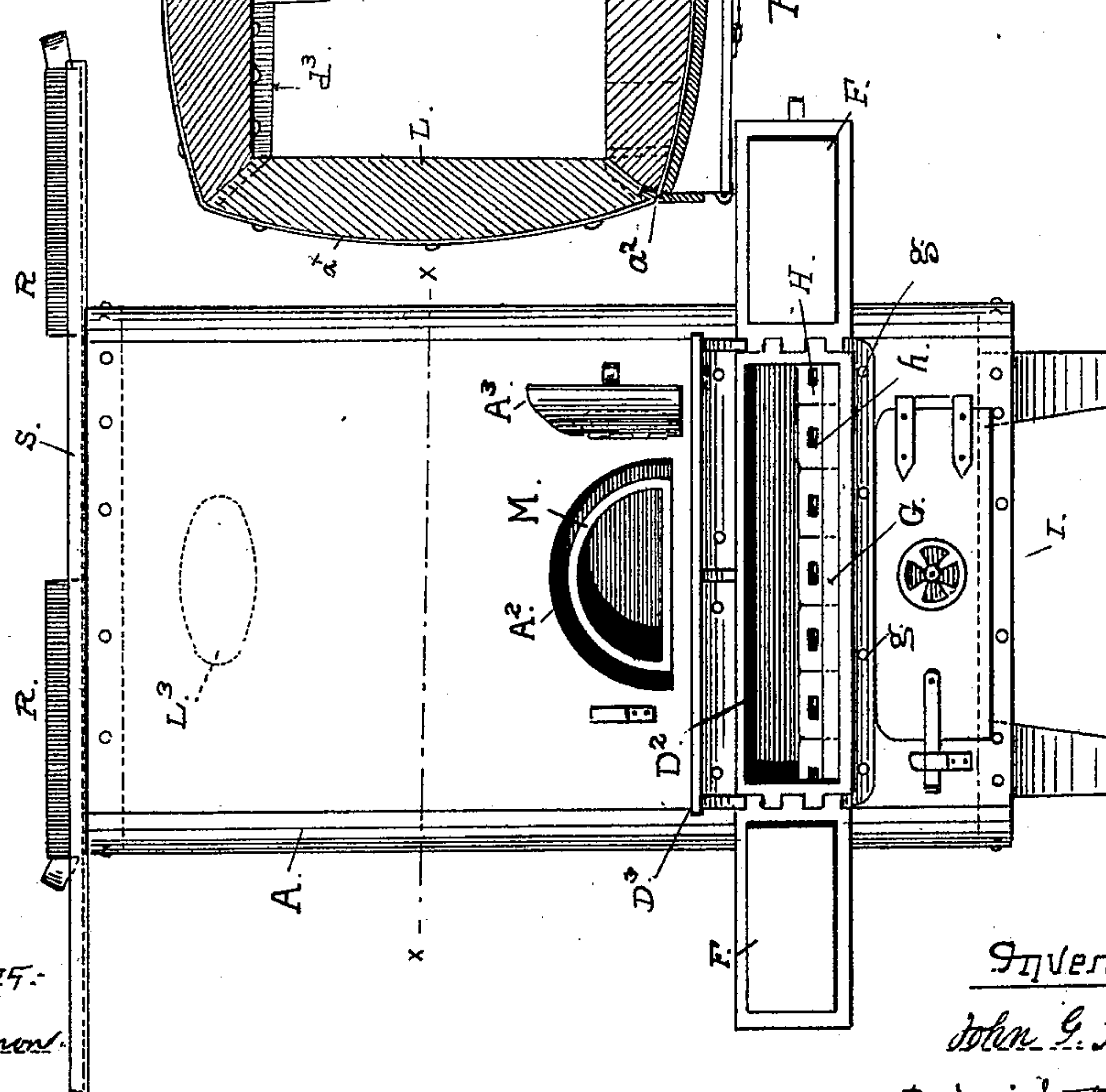


Fig. 1.

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2 Sheets—Sheet 2.

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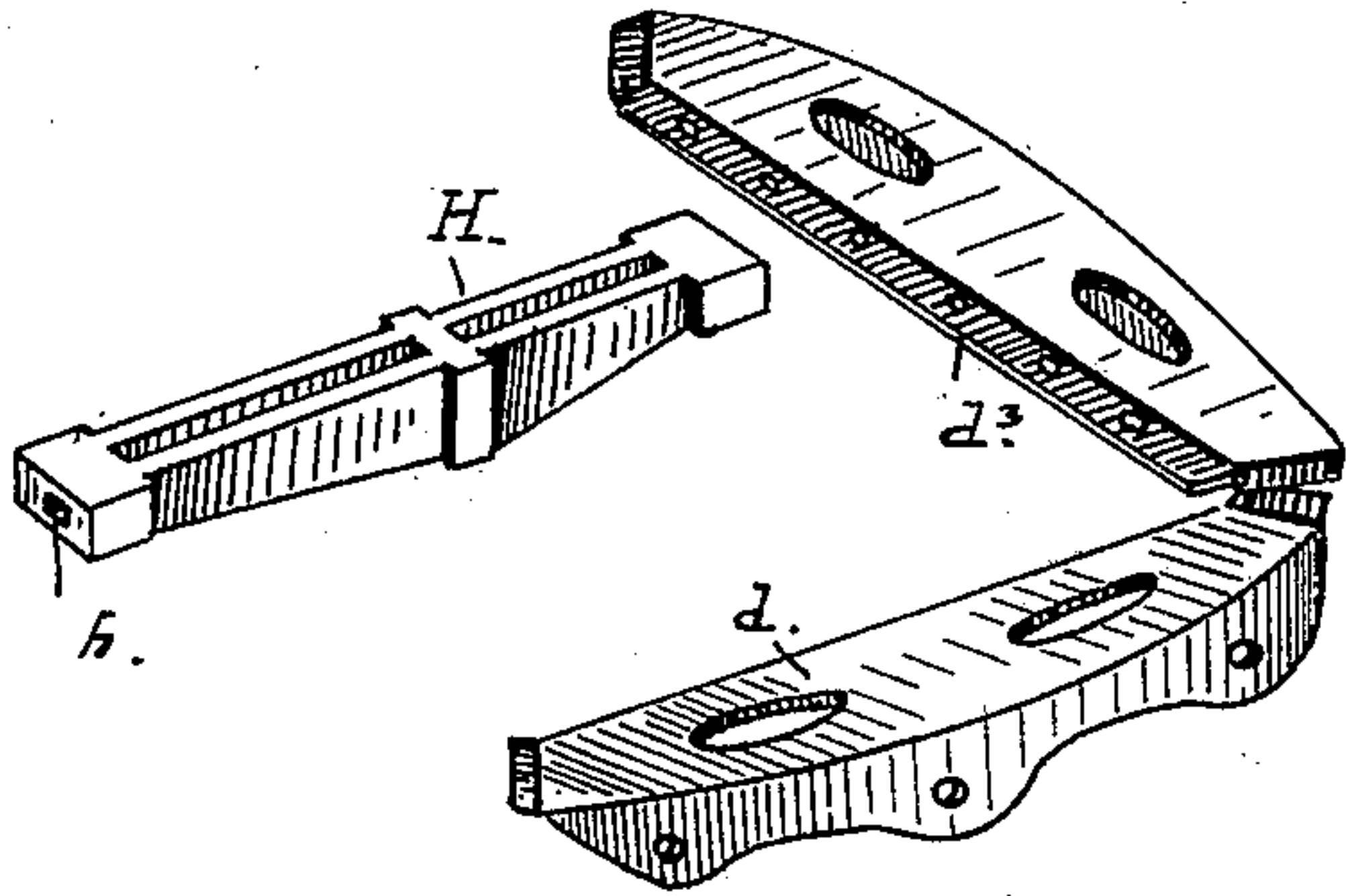


Fig. 5.

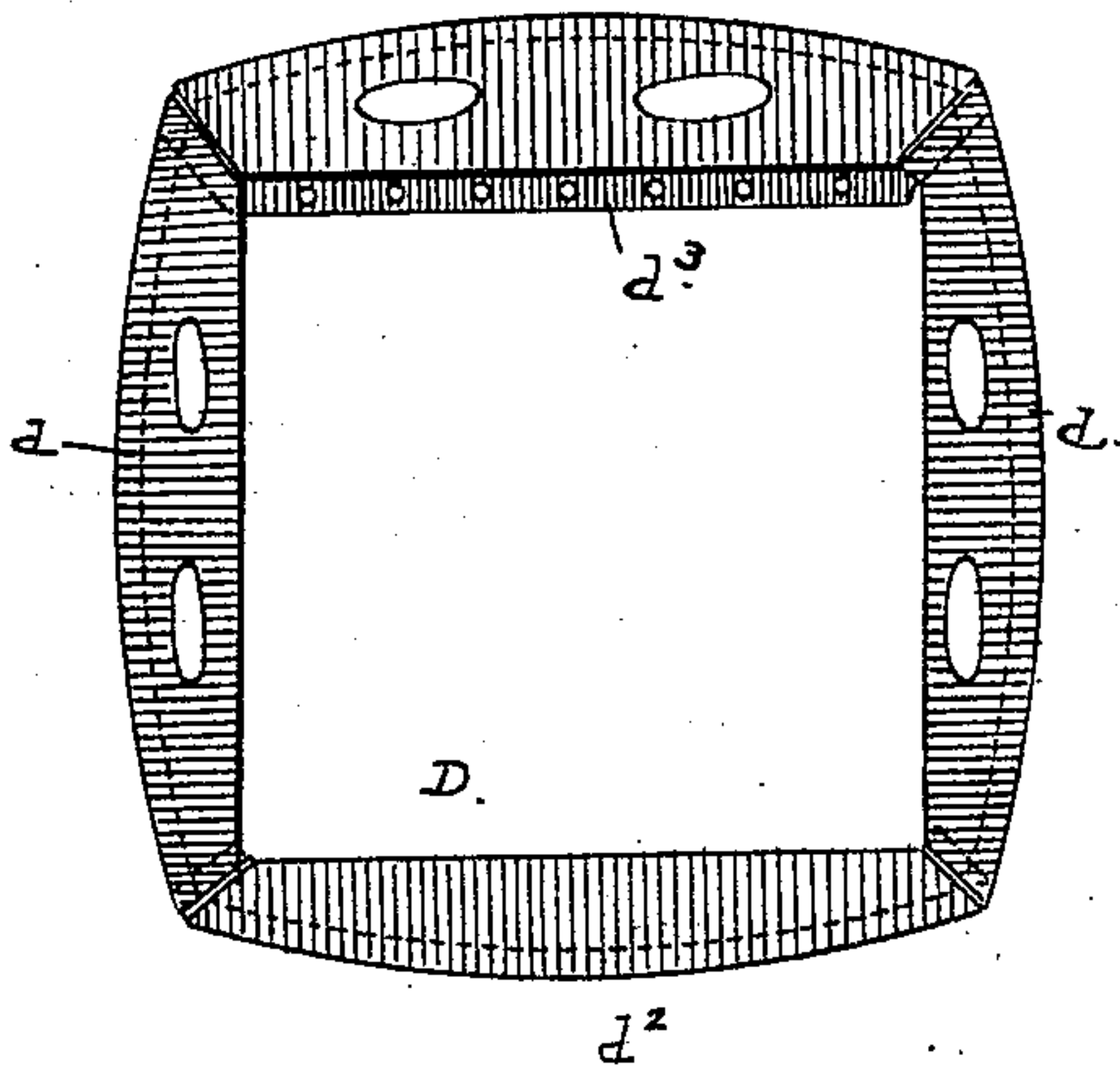


Fig. 4.

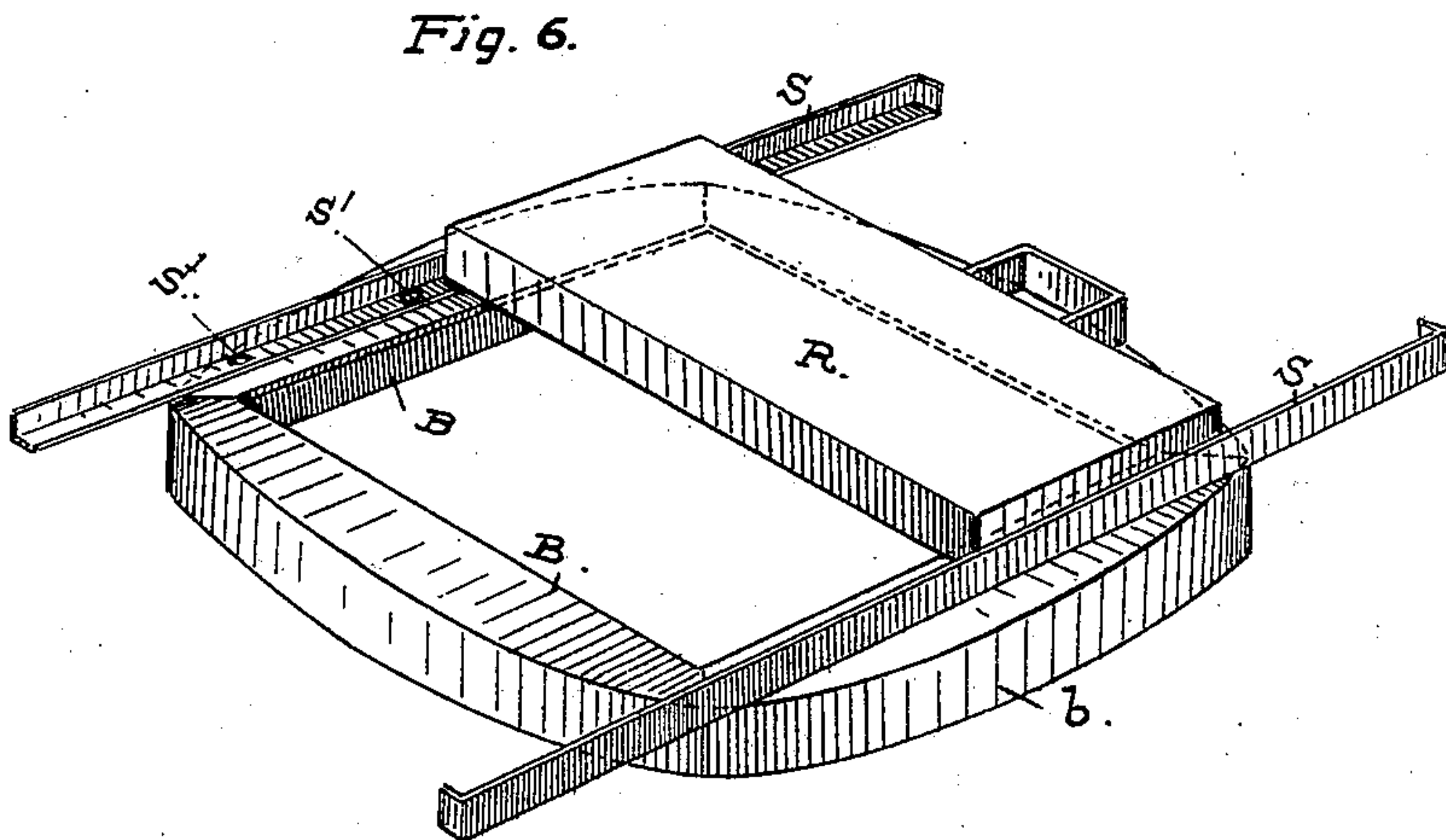


Fig. 6.

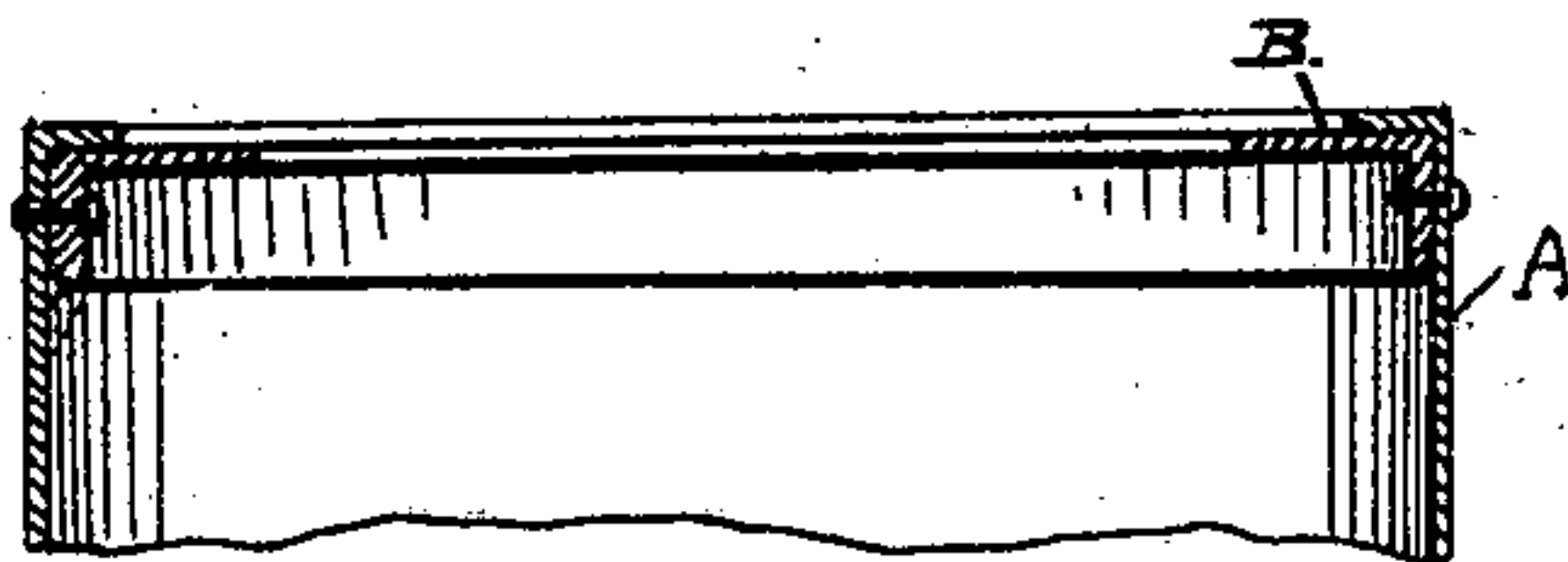
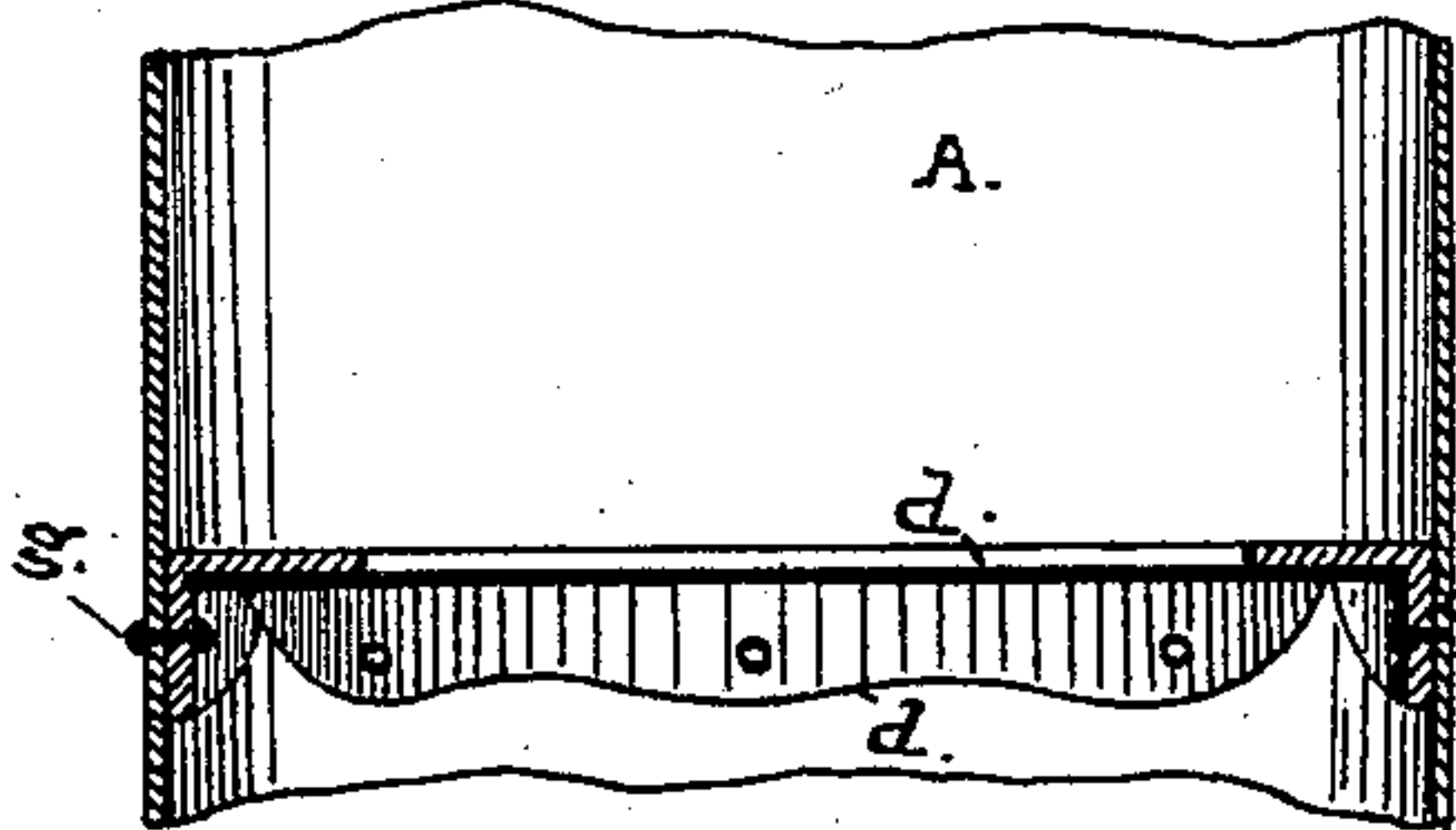


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN G. ILS, OF SAN FRANCISCO, CALIFORNIA.

PORTABLE ASSAY-FURNACE.

SPECIFICATION forming part of Letters Patent No. 606,149, dated June 21, 1898.

Application filed December 4, 1897. Serial No. 660,813. (No model.)

To all whom it may concern:

Be it known that I, JOHN G. ILS, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Portable Assay-Furnaces, of which the following is a specification.

This invention has for its object the production of a portable assay-furnace that can be taken apart for transportation and readily set up for use and one that combines in its construction the relatively large capacity of the square furnace and the quality or property possessed by the cylindrical furnace of withstanding high temperatures without warping or being twisted out of shape.

To such ends and object my said invention consists in certain novel construction and combination of parts, as hereinafter fully described, and pointed out in the claims at the end of this specification, reference being had to the accompanying drawings, forming part thereof.

Figure 1 of the said drawings represents, in front elevation, a portable furnace for assay-ers' use constructed in accordance with my invention. Fig. 2 is a longitudinal section. Fig. 3 is a horizontal cross-section on the line $x x$, Fig. 1. Fig. 4 is a plan or top view of the cast-metal plates that support the lower end of the tile-lining and the grate-bars. Fig. 5 is a perspective view showing two of the cast-metal plates and one of the grate-bars in detail. Fig. 6 is a perspective view of the top plates and the sliding covers. Fig. 7 is a vertical section of the top and bottom of the shell and the cast-metal plates to which the shell is united before the lining-tiles are inserted.

The exterior shell A is formed of sheet-iron bent to inclose the four sides of a square, but with each side bowed outwardly in the form of the segment of a cylinder, as seen at a^x , Figs. 2 and 3. For furnaces of smaller sizes the shell is formed of a single sheet bent in the manner before described and with the two edges joined together in a perpendicular seam at one corner, as shown at a^2 , Fig. 3. Within the top of this shell is fixed a top frame B, composed of four cast-metal plates $b b b b$, joined together by lapped joints, and to these

the shell A is united to produce a close joint by turning the edge of the sheet metal over the tops of the plates and also by riveting the sheet metal to the plates.

In the lower part of the furnace-body cast-metal plates $d d d$ form a frame D, that serves both to support the tiles or lining L and to carry the ends of the grate-bars H. The front plate d^2 is a part of the door-frame D^2 , which is inserted through an opening cut for that purpose in the sheet-iron shell, and the ends of the side plates are joined to it by lap-joints. The sheet-iron is secured to the plates $d d$ and to the door-frame by screws or rivets $g g$, and in the same manner the top frame is secured in place. The lining L held between these two frames is composed of large tiles formed with curved outer faces and straight inner faces, corresponding to the form in outline of the supports $d d$.

In the rear tile is an opening L^3 for the chimney-pipe, and near the bottom end a shelf L^2 to support the rear end of the muffle M. The front tile is pierced with a D-shaped opening L^4 to admit the muffle, and the sheet-iron shell is provided with an aperture A^2 of the same shape and a door A^3 to cover it.

D^3 is a shelf cast in one piece with the door-frame and projecting from the front of the furnace-body to furnish a rest for the muffle when inserting or removing it.

The front end of the muffle rests upon the bottom of the aperture L^4 in the front tile and the rear end on the shelf L^2 , leaving ample space within the furnace on either side for crucibles and pots to be placed directly on the fire.

Supports for the ends of the grate-bars are furnished at the back by the ledge d^3 on the plate d , and at the front on the support G, laid on the bottom d^2 of the door-frame D. Both this support G and the grate-bars are removable for convenience of cleaning the furnace and for replacing worn parts with new parts as they become warped or injured by the heat.

F F are doors hinged on the frame D^2 to close the opening.

The ash-pit I beneath the grate-surface is provided with a closed bottom and an opening in the front of the body with the door K.

The legs P, of sheet-iron, are riveted to the body at the corners to raise the furnace from the floor.

5 The open top of the furnace-body is closed by two sliding doors R R, movable from opposite sides to the center and confined in place by two rails S S, formed of angle-iron and secured by screws S' to the plates of the top frame. The ends of the rails are turned
10 at right angles to form stops for the sliding doors. As thus constructed, these parts are readily put together to form the furnace, and when taken apart they can be easily packed for transportation. The construction is also
15 especially adapted to withstand the great heat which is required in the work of the assayer.

The grate-surface is formed of bars H, each independently removable and also capable of
20 being turned over to dump the fire. A rectangular hole h, in the front end of each bar for inserting a bar or lifter, permits the bars to be handled readily and turned over for dumping the fire, and any bar can be removed
25 when burned out and replaced by a new one without disturbing the others.

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

30 1. A portable assay-furnace comprising substantially a four-sided sheet-metal body each side of which is convex in cross-section,

lining-tiles having flat inner faces and convex outer faces inclosing a rectangular furnace-space, the angular cast-metal plates secured
35 to the sheet-metal body and adapted to support the tiles, the cast-metal top within the sheet-metal body, and to which the same is riveted, said top having a rectangular opening, slidable covers on said top and fixed
40 guide-rails carrying said covers, an opening in the front of the furnace-body for inserting a muffle, a grate-surface in the lower part of the furnace-body, a fuel-opening in the front provided with doors and an ash-pit below the
45 grate-surface closed at the bottom and having an opening covered by a door.

2. An assay-furnace having a four-sided sheet-metal body, each side of which is convex in horizontal cross-section, in combination with lining-tiles having convex outer
50 faces and flat inner faces, said tiles when in place producing a fire-space substantially rectangular in horizontal cross-section and the cast-metal angle-plates riveted to the sheet-
55 metal body and adapted to support the lining-tiles.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

JOHN G. ILS. [L. S.]

Witnesses;

H. J. LANG,

EDWARD E. OSBORN.