

No. 696,548.

Patented Apr. 1, 1902.

A. C. CALKINS.
ASSAYING FURNACE.

(Application filed Feb. 5, 1901.)

(No Model.)

2 Sheets—Sheet 1.

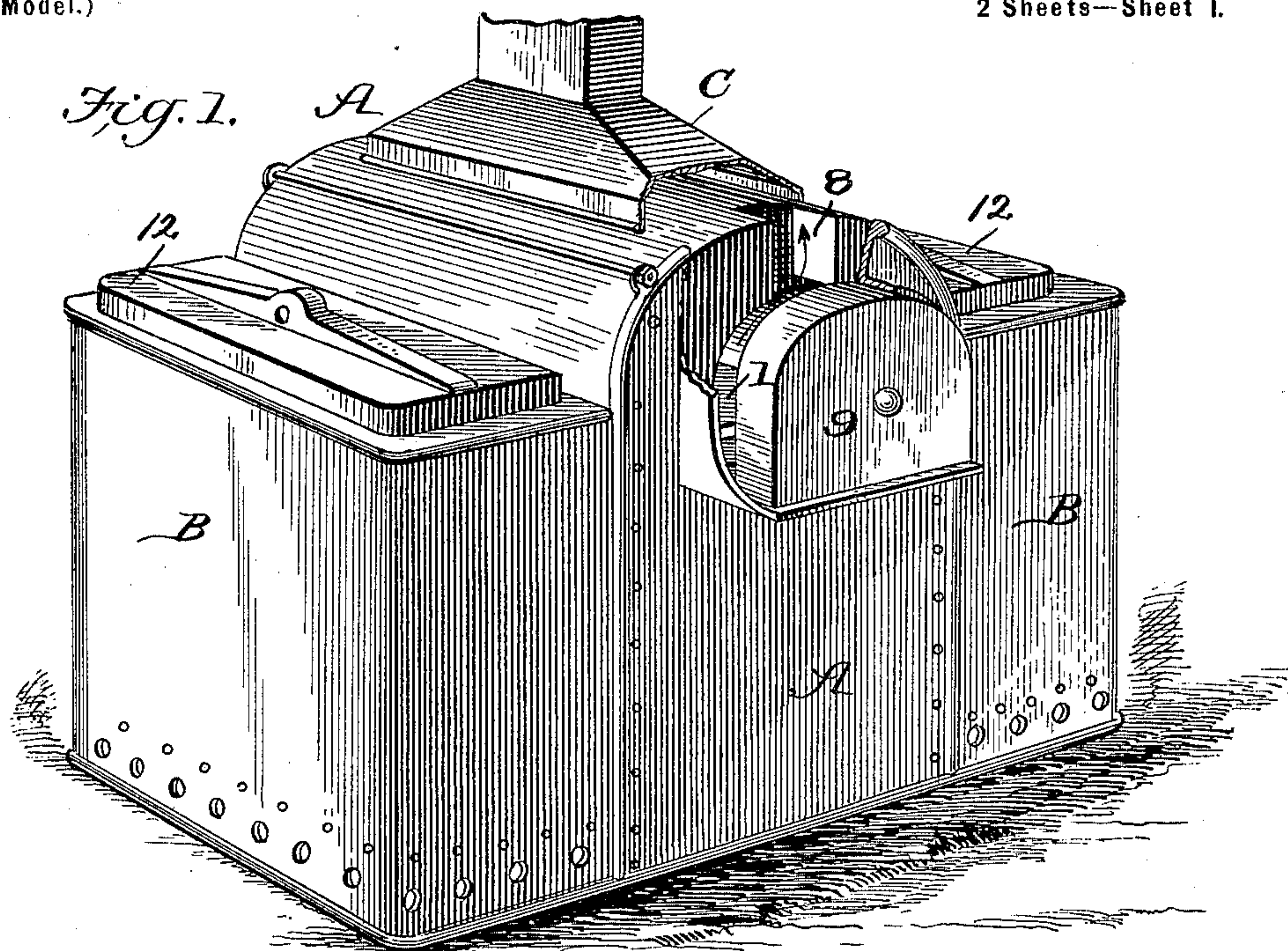


Fig. 2.

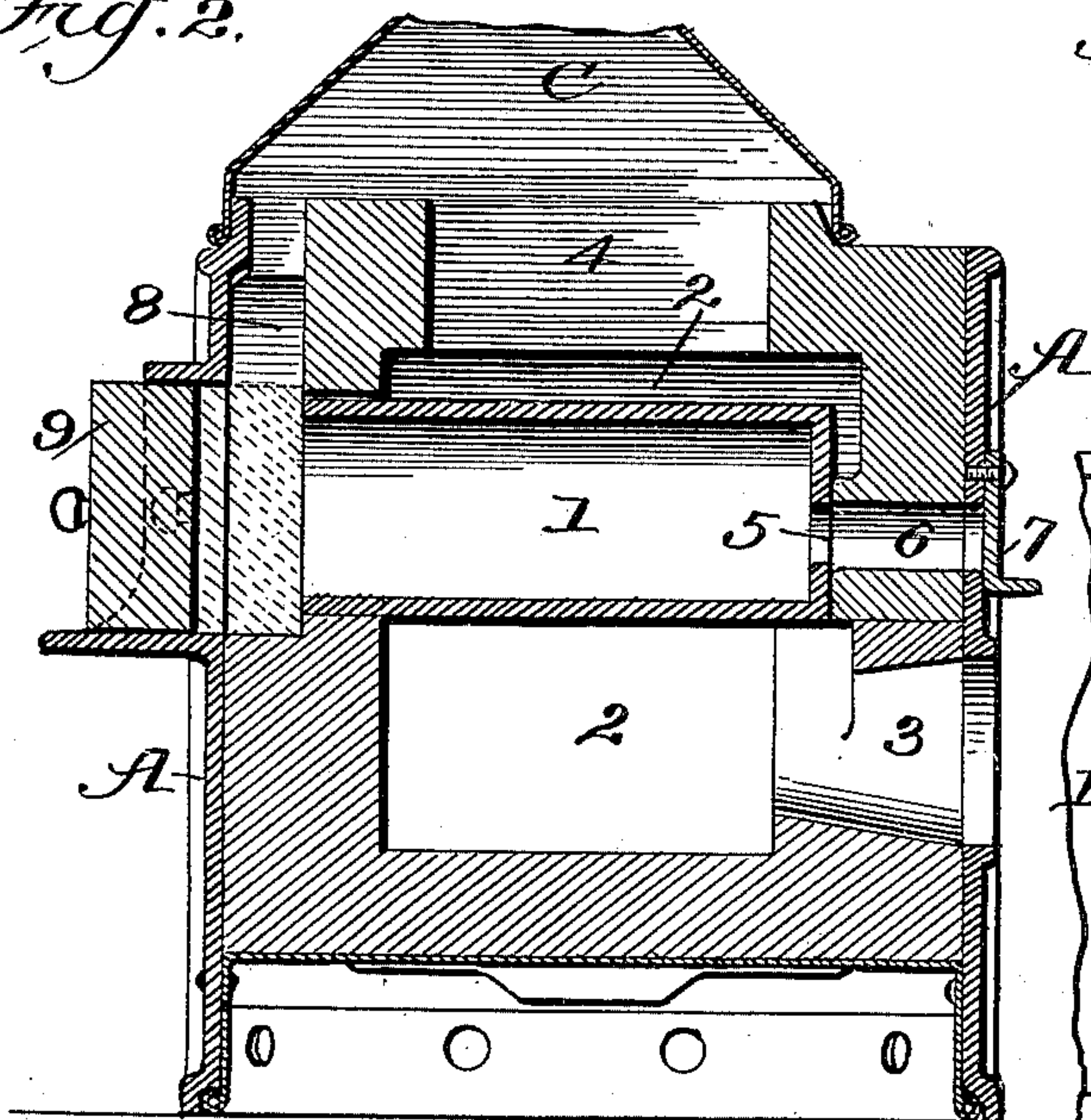
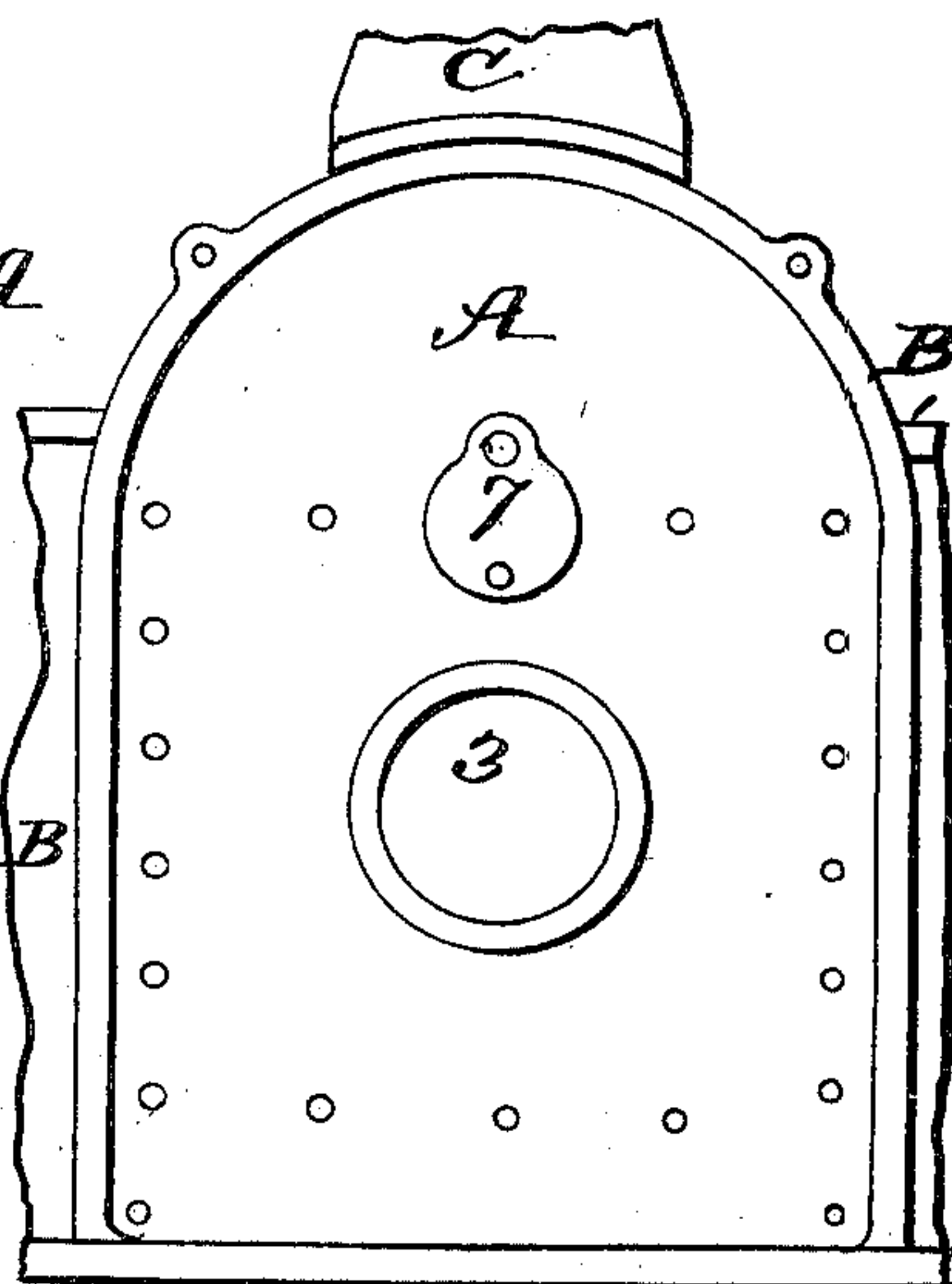


Fig. 3.



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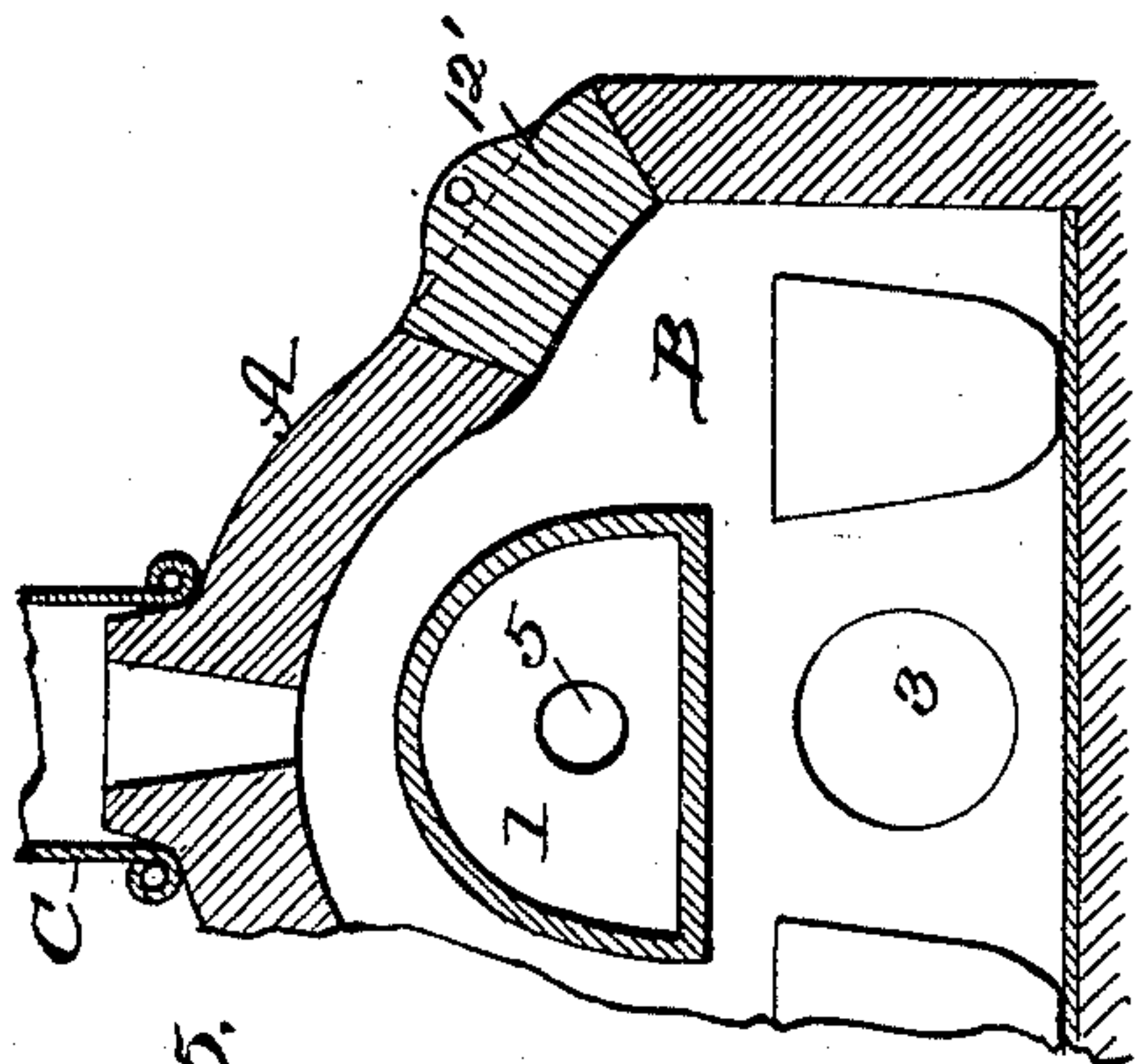
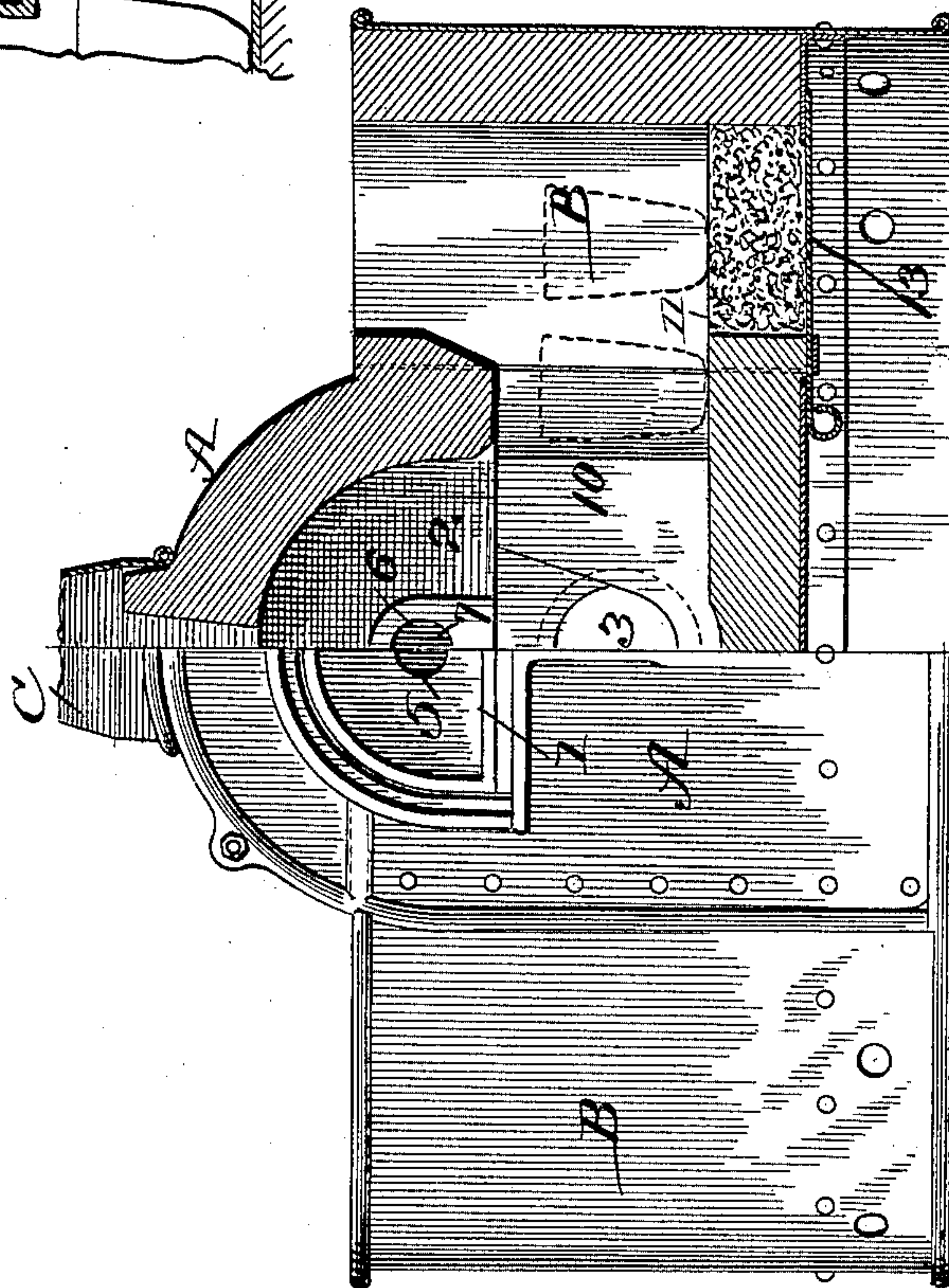


Fig. 5.

Fig. 4.



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UNITED STATES PATENT OFFICE.

ALBERT CHAMPLIN CALKINS, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO
FREDERICK W. BRAUN, OF LOS ANGELES, CALIFORNIA.

ASSAYING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 696,548, dated April 1, 1902.

Application filed February 5, 1901. Serial No. 46,049. (No model.)

To all whom it may concern:

Be it known that I, ALBERT CHAMPLIN CALKINS, residing at Los Angeles, in the county of Los Angeles and State of California, have made certain new and useful Improvements in Assaying-Furnaces, of which the following is a specification.

My invention is an improvement in the class of assayers' furnaces which are adapted for use of gas or a volatilizable hydrocarbon as a heating medium. It is more particularly a combined muffle and melting-furnace, and an improvement upon, or in the same line as, those covered by the patents of J. J. Loner-
gan and A. C. Calkins, No. 608,883, and G. W. Martin and A. J. Petter, No. 635,586.

The features of improvement and novelty are as hereinafter described, and shown in accompanying drawings, in which—

Figure 1 is a perspective view of my improved furnace, part being broken away to show interior construction. Fig. 2 is a central vertical transverse section of the furnace. Fig. 3 is an elevation of one end of the central portion of the furnace. Fig. 4 is an end view of one longitudinal half and a vertical section of the corresponding half of the furnace. Fig. 5 shows a modified construction.

The furnace has two main divisions—to wit, the central portion A, containing the muffle 1, and two side crucible-chambers B B, which are similar in form, construction, arrangement, and operation. The sides of the furnace are incased by sheet or cast metal, which extends below the fire-brick and is provided with ventilating-openings. The muffle is arranged transversely of the central part A and traverses a combustion-chamber 2, having a side opening 3 for introduction of a suitable gas or hydrocarbon burner. (Not shown.) From such combustion-chamber 2 a flue 4 (see Fig. 2) leads to the bonnet C, which is constructed of sheet metal and set and held detachably upon the top of part A. The front end of the muffle 1 is entirely open, and the rear or inner end has an opening 5, which communicates with a passage 6, extending through the rear end wall of the furnace portion A. The said passage 6 is guarded by a pivoted drop cover or valve 7 and serves as an inspection-opening and for admission of

air as may required for the best results in oxidation and reduction.

From the front end of the muffle 1 a passage 8 (see Figs. 1 and 2) leads upward, it being formed in the end of the arch of the combustion-chamber 2, and, like the main flue 4, it leads direct into the bonnet C. This passage 8 may be closed by the plug or block 9, which is adapted to fit and slide in a horizontal passage formed in the front wall of part A, in alinement with the muffle 1. The said plug 8 is adapted to slide in a hood 9, having a bottom shelf or bracket wherein the plug rests, as shown. Thus when pushed in against the end of the muffle 1, as shown by dotted lines, Fig. 2, it closes or shuts off the passage 8, and when drawn out, as shown in full lines, the said passage 8 is left free or open.

It will be understood that the air for oxidizing the charge in the muffle is admitted through the passage 6 in the back of the furnace A and that a draft through the front passage 8 is induced by the draft in the main flue 4. Thus the draft through the muffle 1 may be perfectly regulated and any desired amount of oxygen may be supplied, as the conditions of the cupeling operation require.

As shown in Figs. 2 and 4, the central combustion-chamber 2 has wide lateral passages 10, that lead into the side crucible-chambers B. Each of the latter has a base which may be formed wholly or in part of fire-clay 11, whereon crucibles or melting-pots are set, as shown by dotted lines, Fig. 4. A bottom slide 13 provides for convenient removal of the clay. In use the flame and heated gases pass from the central and main chamber 2 through passages 10 into the side chambers B, which serve practically as combustion-chambers, wherein the crucibles are exposed to a practically uniform heat.

It will be noted that the bottom of the combustion-chamber 2 is flush with that of the side or crucible chambers B, as shown in Fig. 4. This allows crucibles to be placed in the space beneath the arch, as well as in chambers B, proper. The latter may be provided with covers 12, arranged horizontal, as shown in Fig. 1; but my preferred construction and arrangement are shown in Fig. 5, wherein the

central arch of the furnace is shown extended laterally over the crucible-chambers B, and the latter are provided with a cover or door 12, consisting of a block fitted into a longitudinal opening and supported by the converging sides or angles of such opening. Through the latter access is had to the crucible-chamber for convenient insertion or removal of crucibles. It will be seen that by this extension of the top arch over the crucible-chambers B and the extension of the floor of the latter flush with that of the combustion-chamber 2 I am enabled to lessen the width of the furnace as compared with the form shown in Fig. 4 without decreasing its capacity for holding crucibles.

It is apparent that one of the chambers B may be used for clean assay-work while the other is being used for melting bullion.

What I claim is—

1. The improved assaying-furnace comprising a combustion-chamber having a main top flue, a muffle arranged horizontally in said chamber and having its front end open, and its rear end provided with an air-inlet and a device for regulating admission of air thereto, means for temporarily closing the front end of the muffle, and a supplemental flue or passage leading up from such end of the muffle, substantially as shown and described.

2. The improved assaying-furnace compris-

ing a combustion-chamber having a main top flue, a muffle having its front end open, a supplemental flue or passage leading up from such end of the muffle, and a removable plug adapted for closing both the muffle and said passage, substantially as shown and described.

3. The improved assaying-furnace, comprising a combustion-chamber having a main escape-flue and a bonnet therefor, a muffle which traverses the said chamber and is open at each end, passages in the side walls of the furnace which communicate with the muffle, a passage leading upward from one end of the muffle and connecting with the main flue, a plug for closing the passage and the adjacent end of the muffle, and a valve for closing the opposite end of the muffle, substantially as shown and described.

4. The improved assaying-furnace comprising a central combustion-chamber, having a fire-opening, a muffle which traverses the chamber above such opening, crucible-chambers located on each side of the main chamber, and lateral passages connecting the three chambers, the latter being provided with removable covers, substantially as shown and described.

ALBERT CHAMPLIN CALKINS.

Witnesses:

SIDNEY J. PARSONS,
TREVITT W. OKEY.