

No. 662,221.

Patented Nov. 20, 1900.

W. CLAUSS.
BAKE OVEN.

(Application filed May 25, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

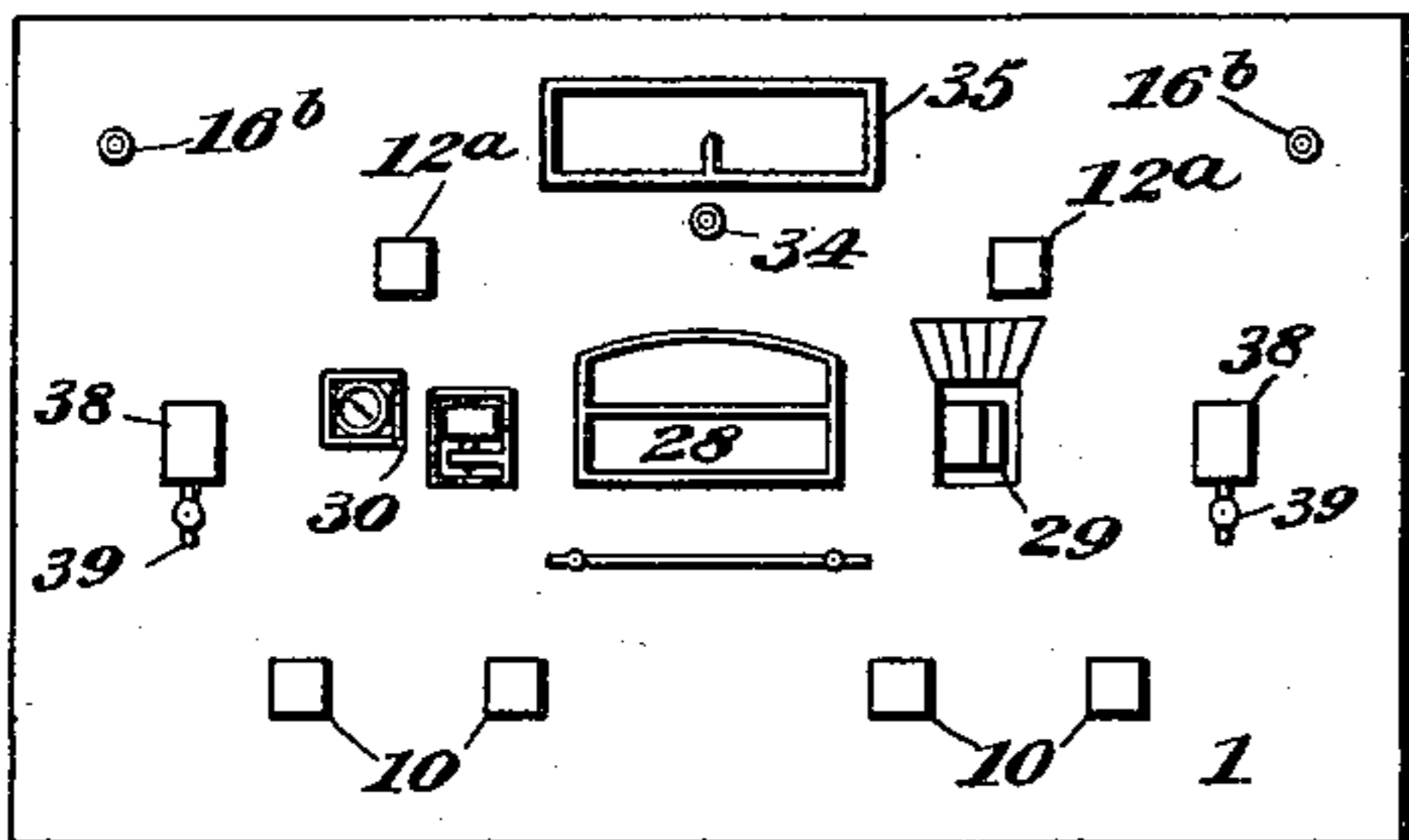


Fig. 2

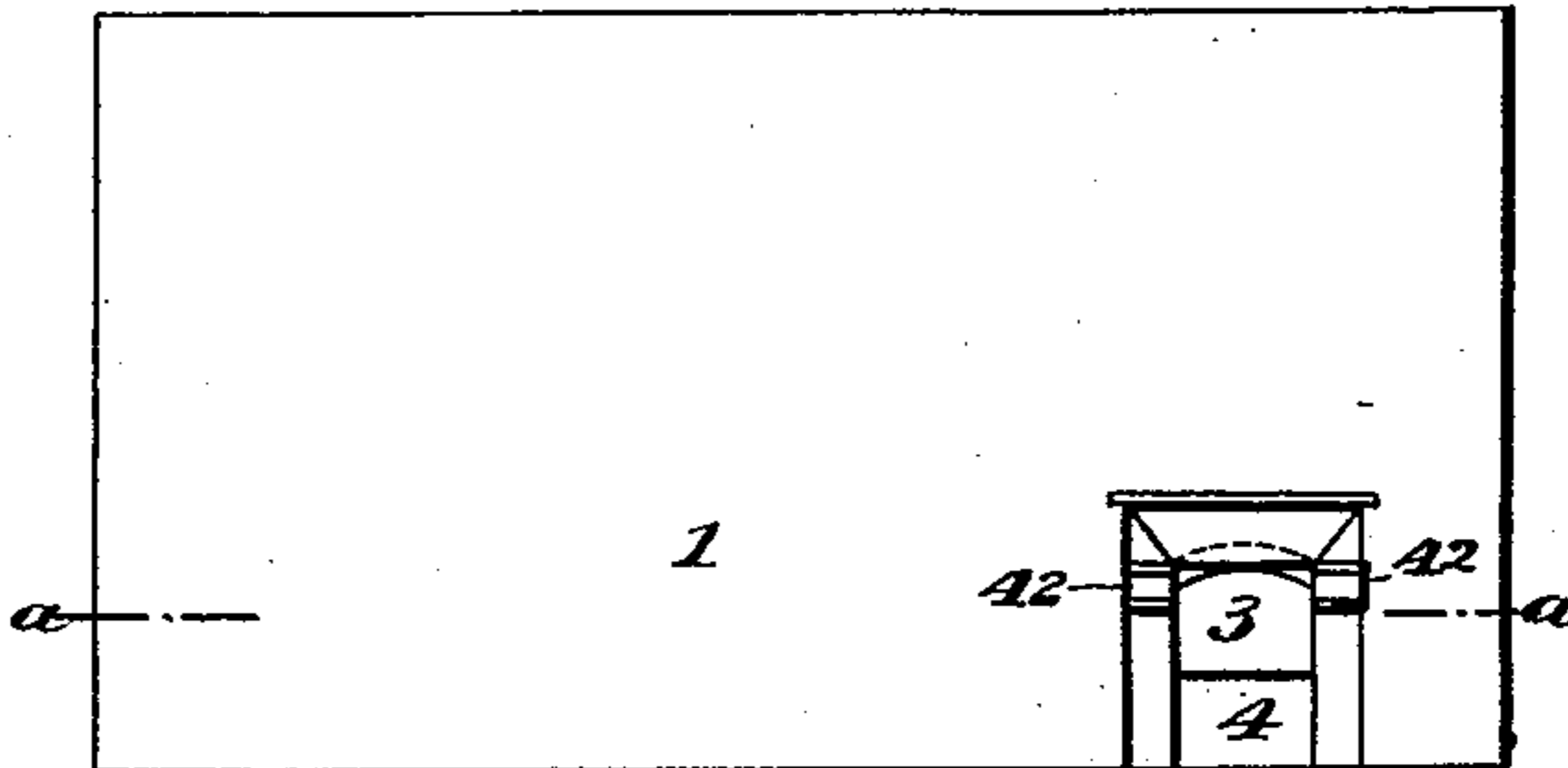


Fig. 3 b

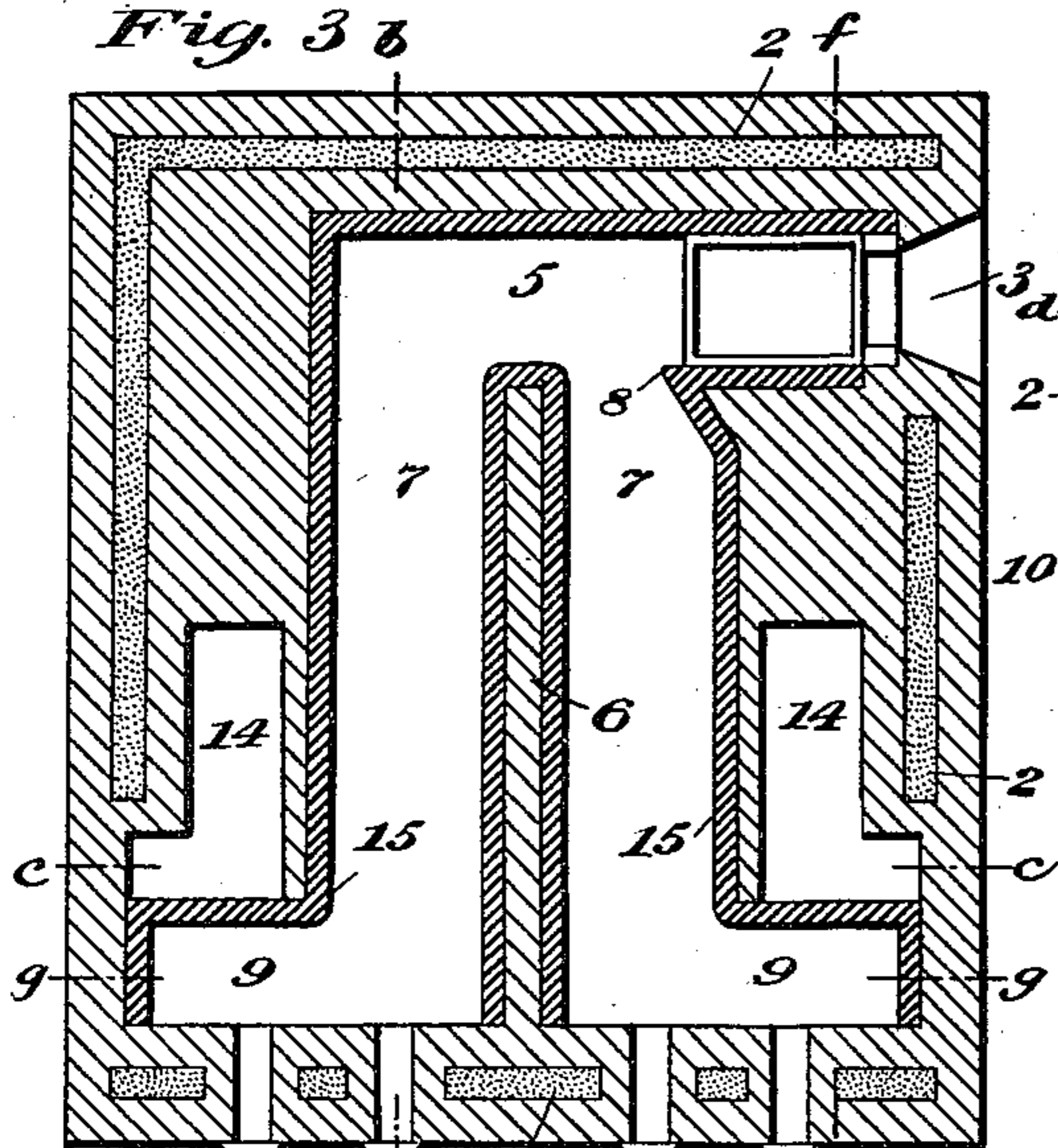


Fig. 4

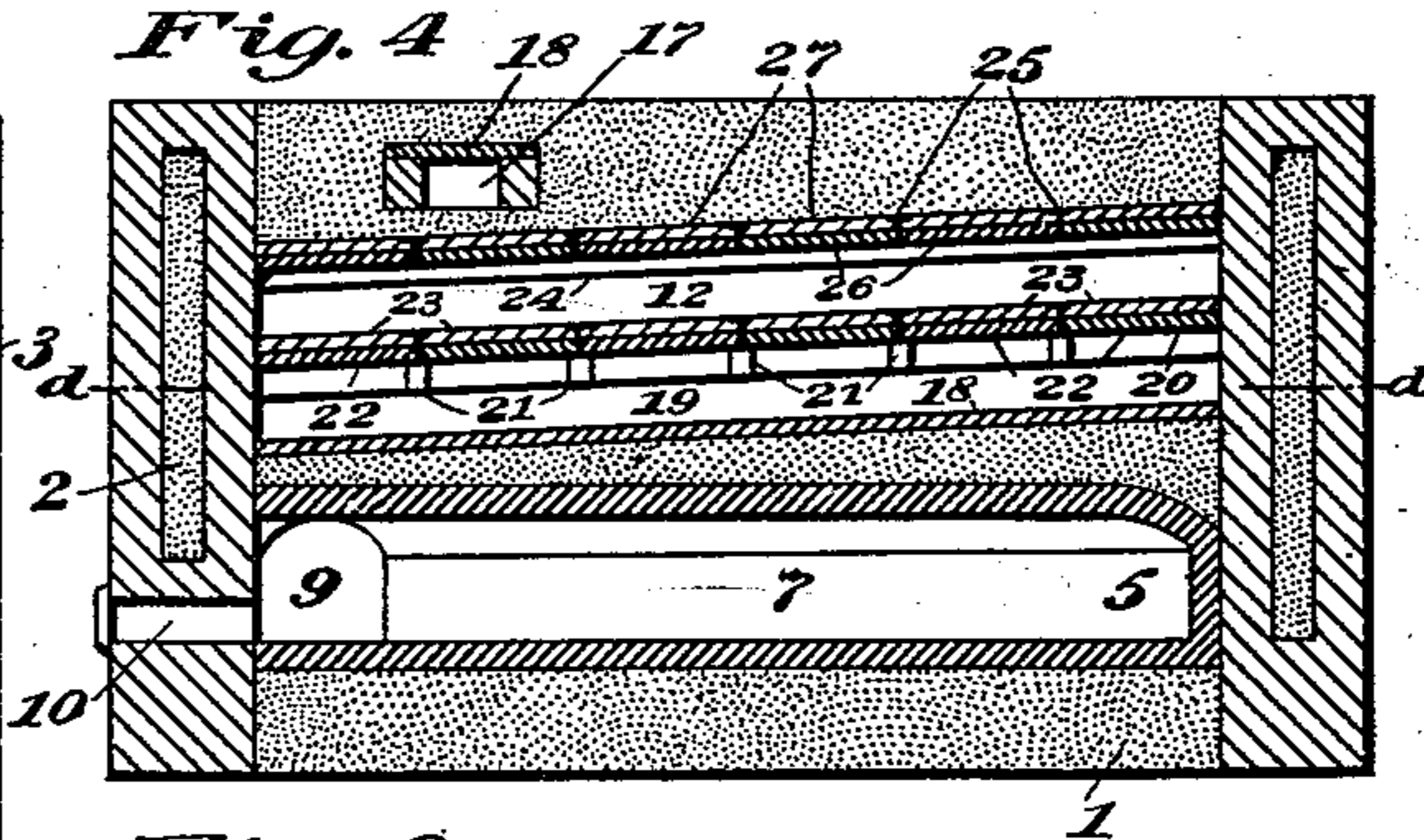


Fig. 6

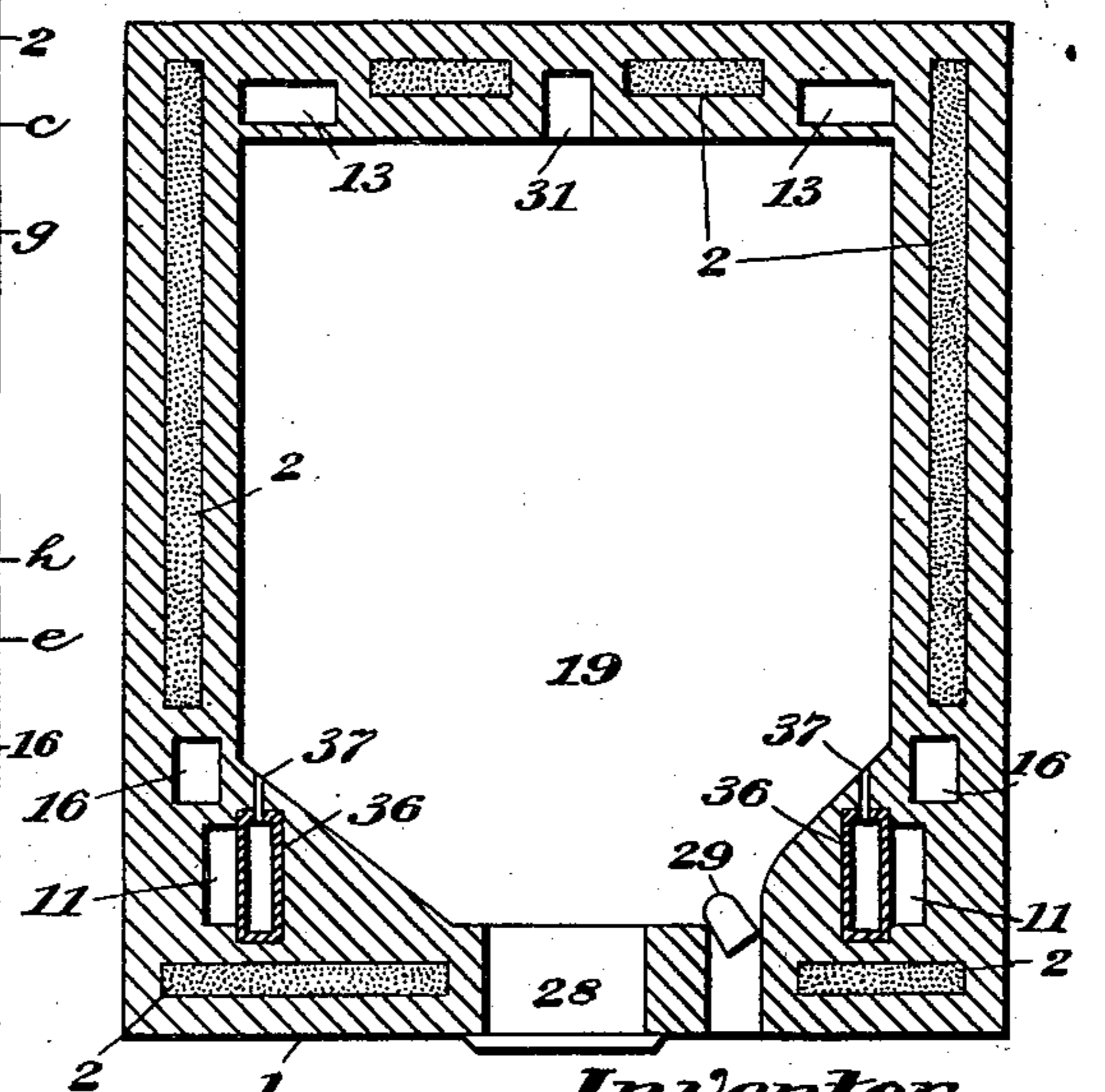
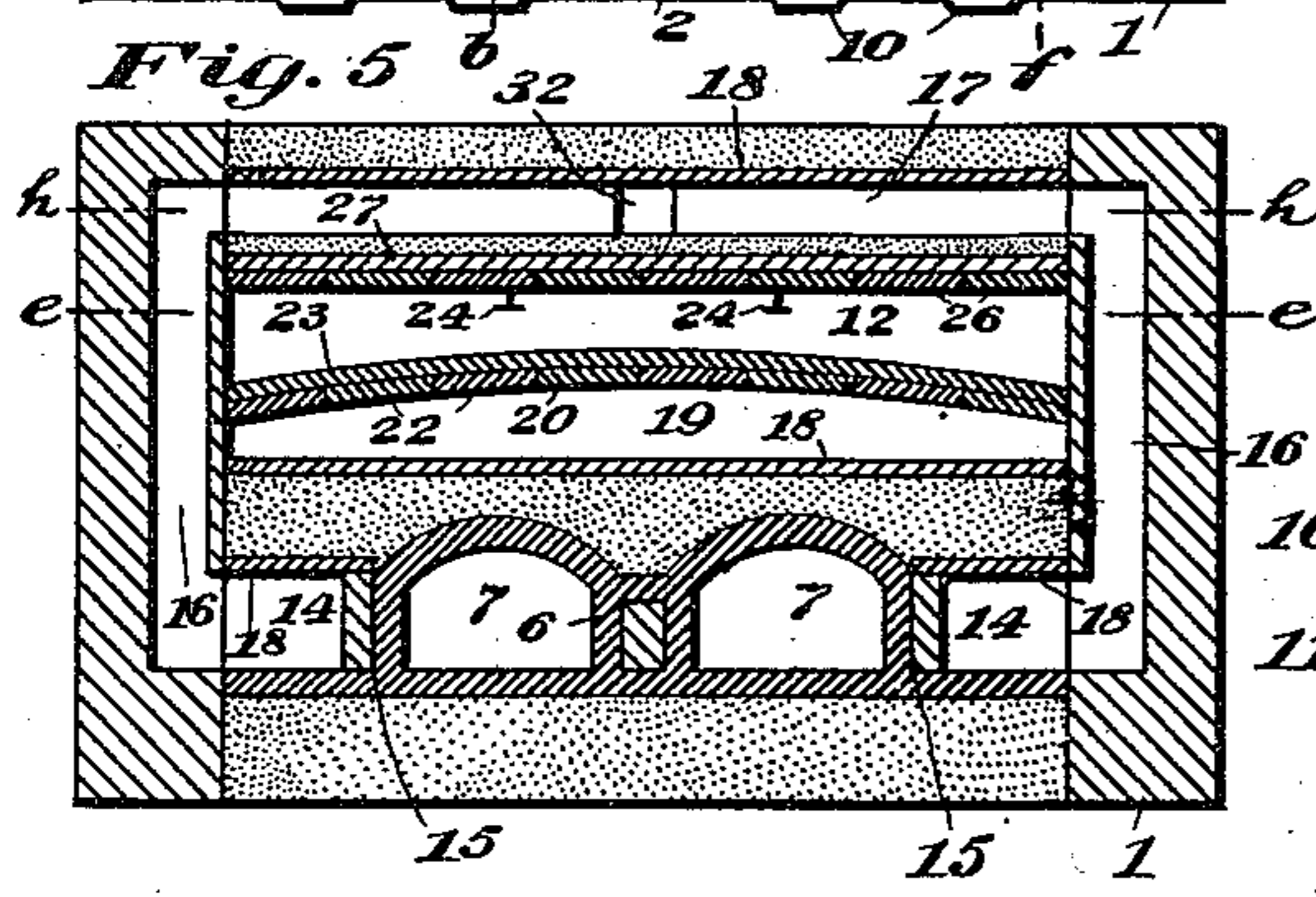


Fig. 5 b



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Fig. 7

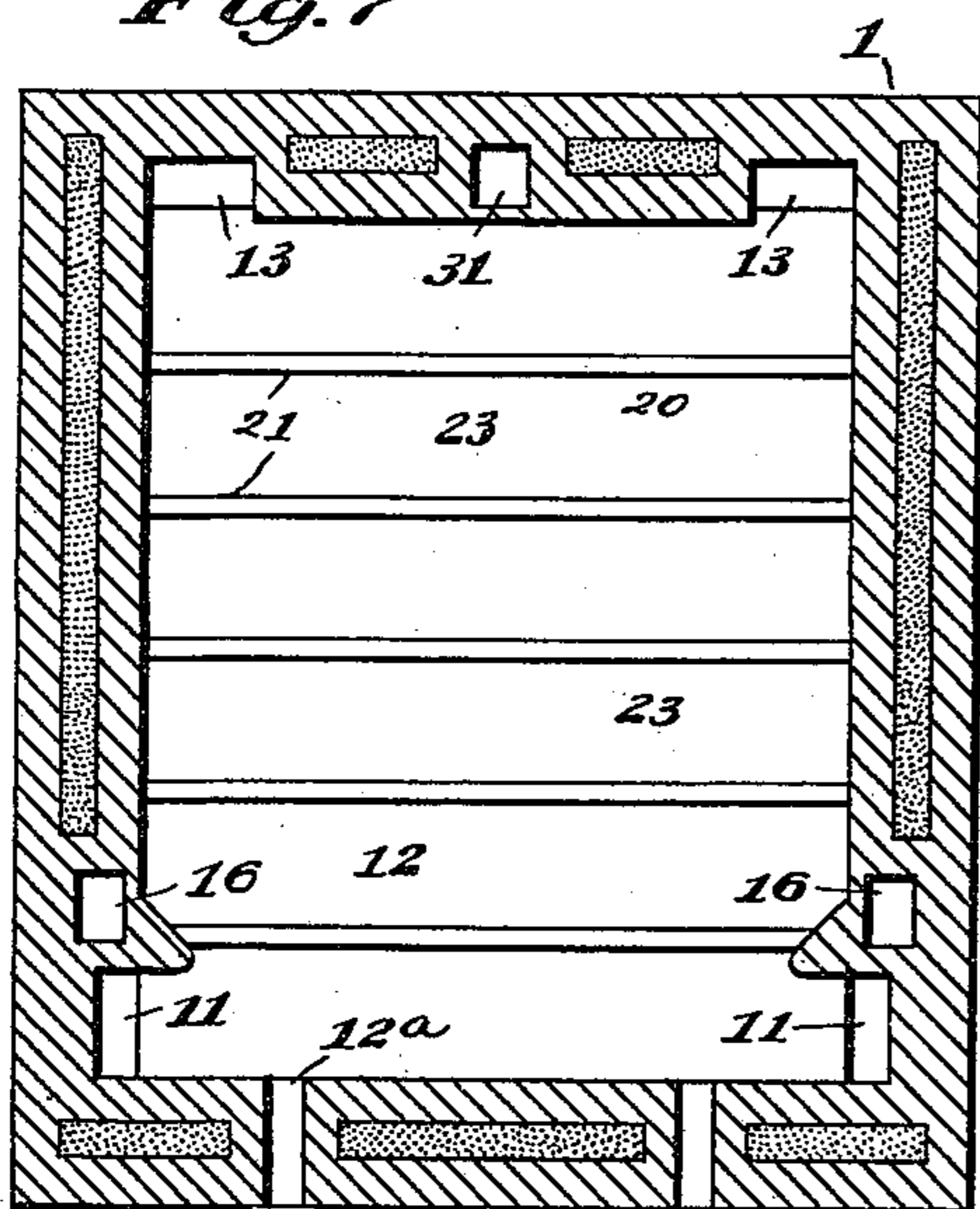


Fig. 8

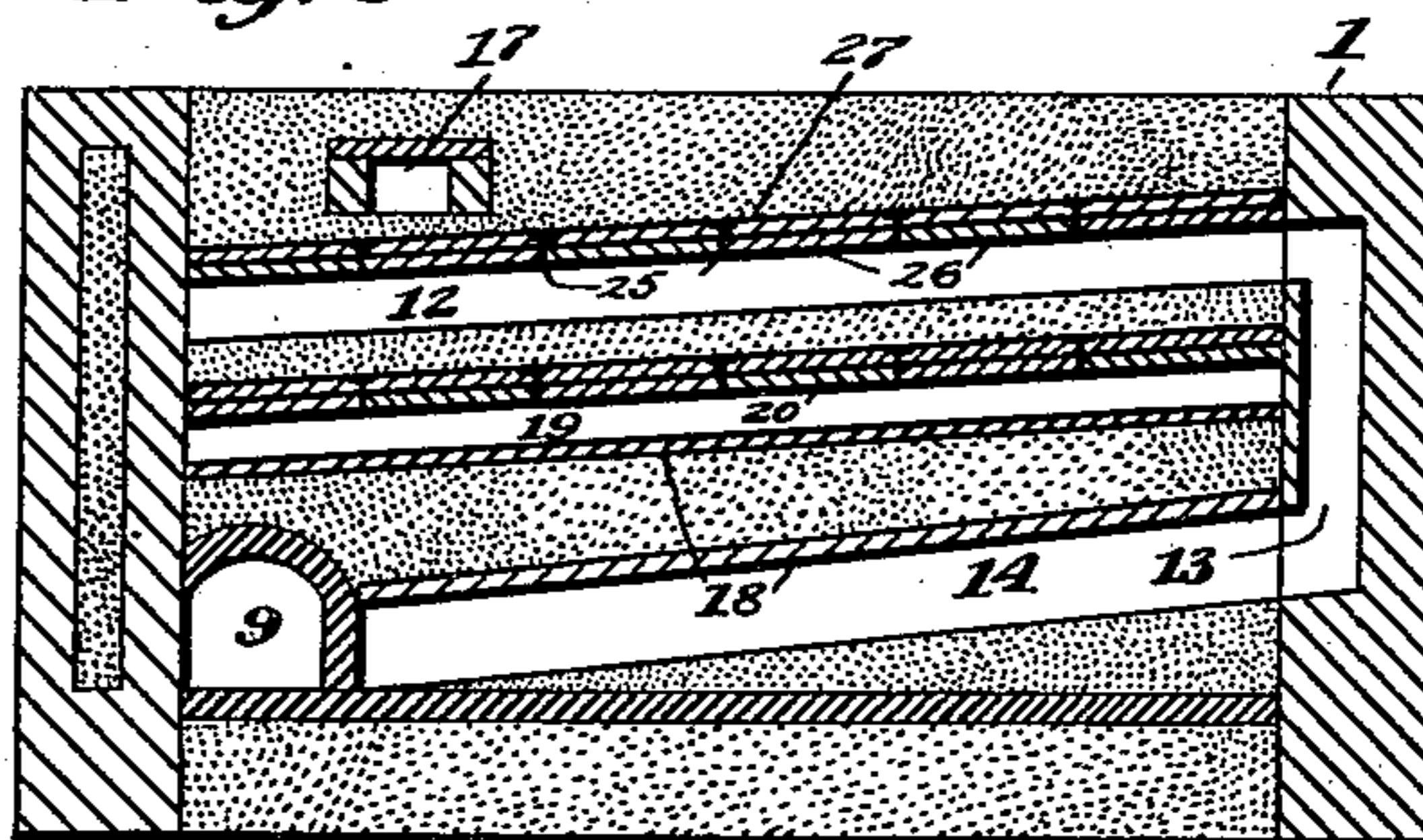


Fig. 10

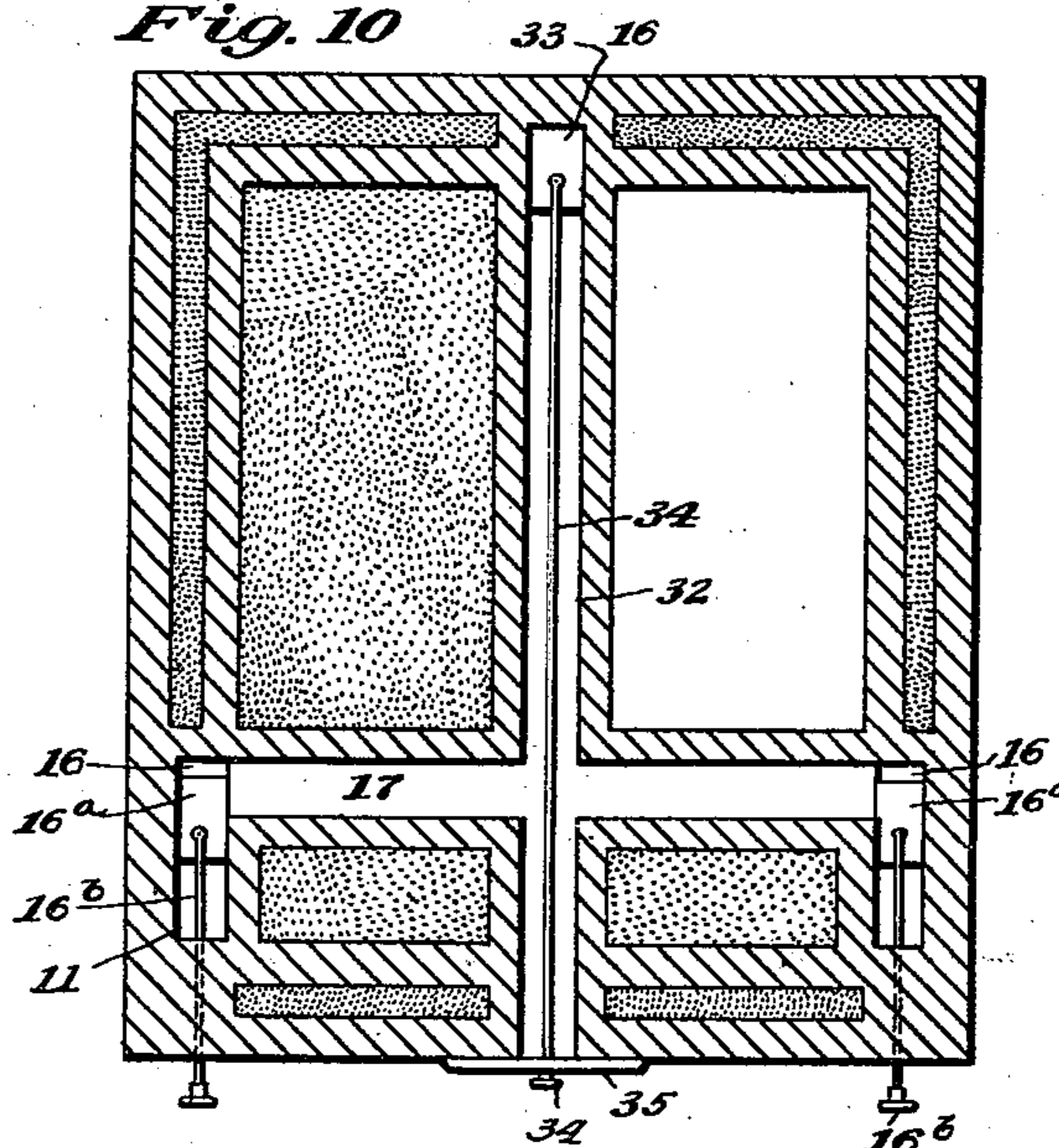


Fig. 9

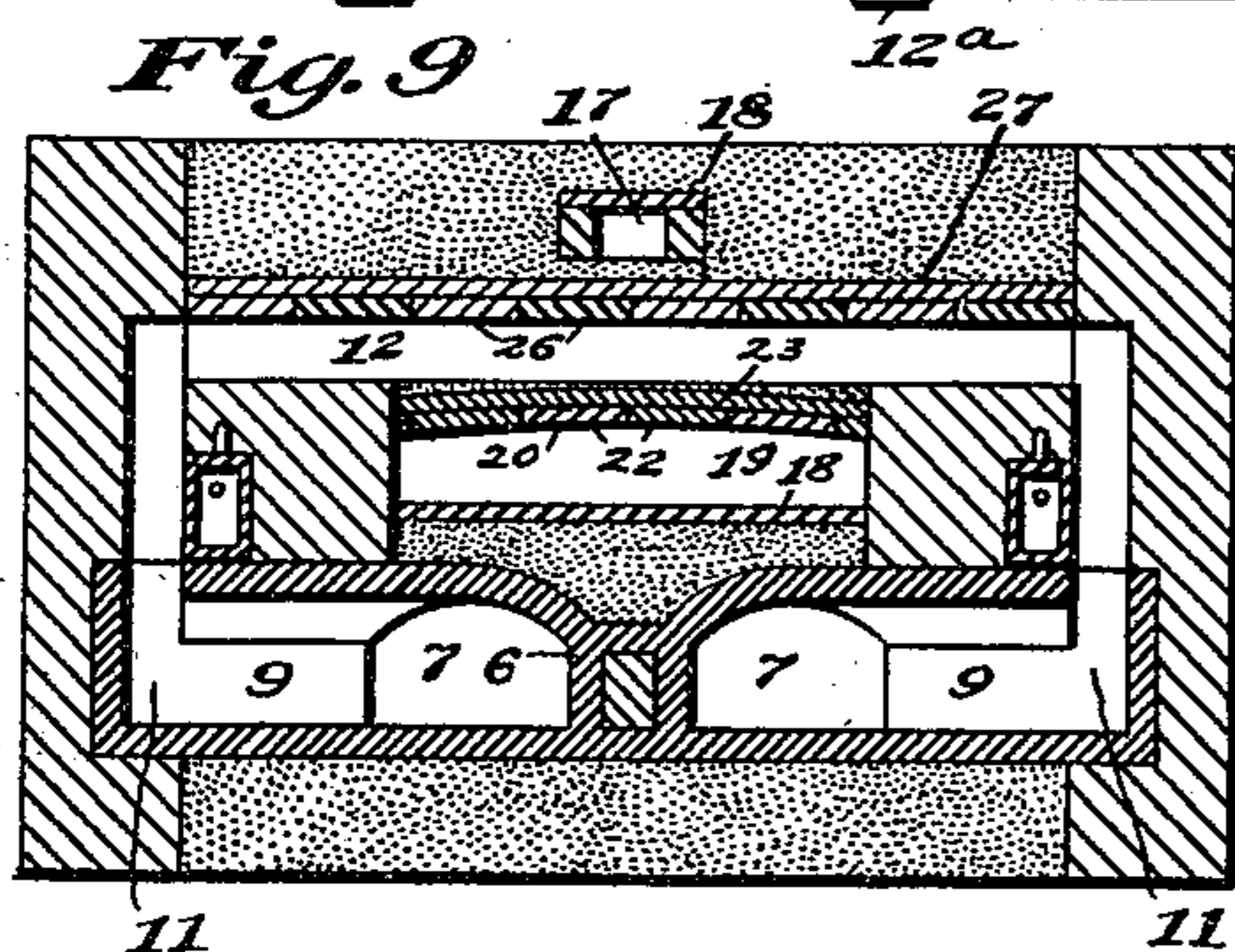
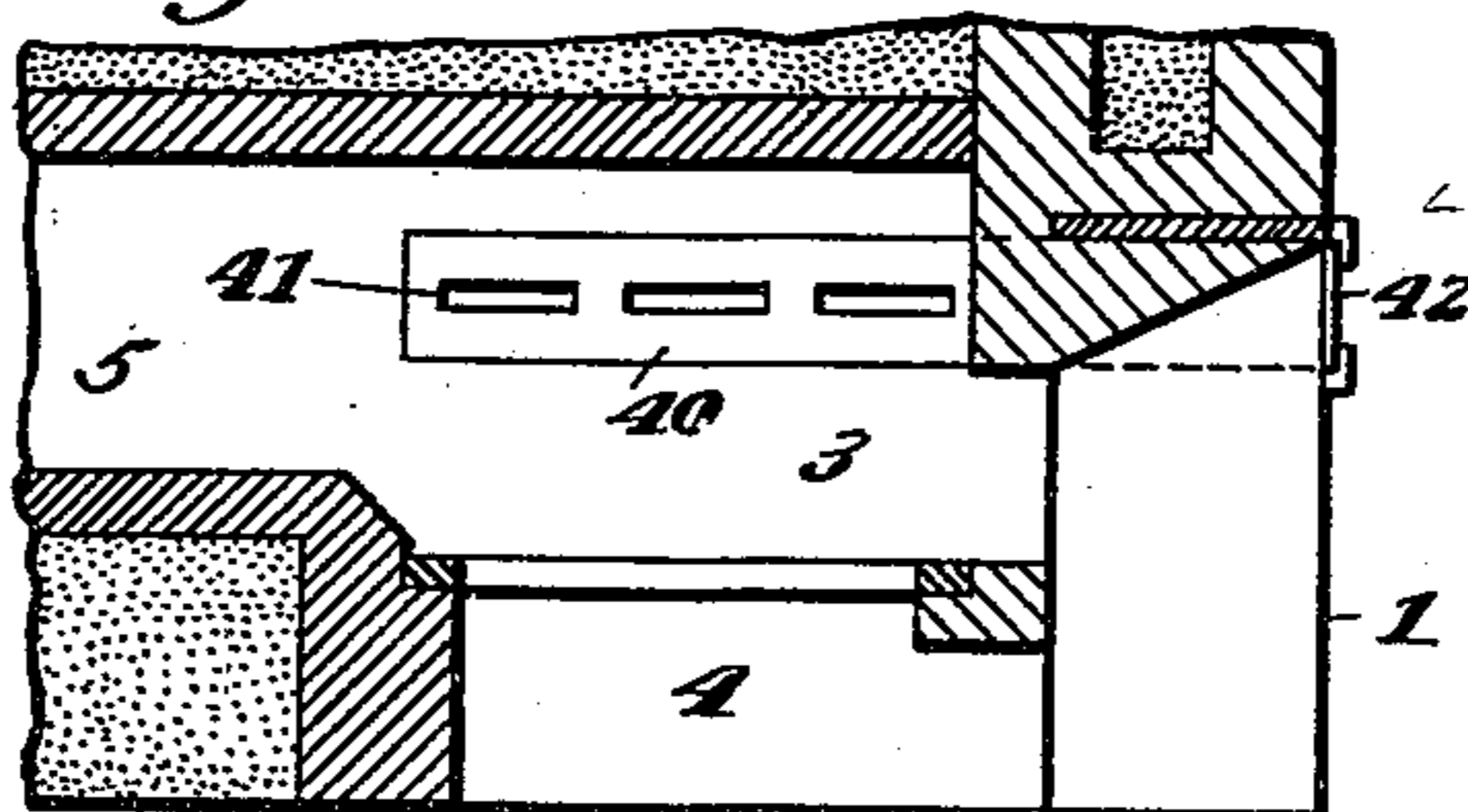


Fig. 11



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UNITED STATES PATENT OFFICE.

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BAKE-OVEN.

SPECIFICATION forming part of Letters Patent No. 662,221, dated November 20, 1900.

Application filed May 25, 1900. Serial No. 17,910. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM CLAUSS, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Bake-Ovens, of which the following is a specification.

This invention relates to certain improvements in bake-ovens, and has for its object to provide an oven of an improved and simple construction which shall be adapted for use in continuous baking and which shall be provided with means whereby the heat is imparted in a substantially uniform manner to all parts of the oven.

The invention consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved bake-oven, whereby certain important advantages are attained and the oven is made simpler, cheaper, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is a front elevation of the improved bake-oven; and Fig. 2 is a side view of the same, showing the fire-door. Fig. 3 is a sectional plan taken through the oven in the plane indicated by the line *a a* in Fig. 2. Fig. 4 is a vertical section taken through the oven from front to rear in substantially the plane indicated by the line *b b* in Fig. 3. Fig. 5 is a vertical section taken transversely through the oven in the plane indicated by the line *c c* in Fig. 3. Fig. 6 is a sectional plan similar to Fig. 3, but taken through the baking-chamber of the oven in the plane indicated by the line *d d* in Fig. 4. Fig. 7 is a sectional plan similar to Figs. 3 and 6, but taken through the smoke-chamber of the oven in substantially the plane indicated by the line *e e* in Fig. 5. Fig. 8 is a vertical section taken through the oven from front to rear in substantially the plane indicated by line *f f* in Fig. 3. Fig. 9 is a vertical section taken transversely through the oven in the plane indicated by line *g g* in Fig. 3. Fig. 10 is a sectional plan taken through the upper flues of the oven in the

plane indicated by line *h h* in Fig. 5. Fig. 11 is an enlarged partial section taken through the fire-box of the oven and showing the means for supplying air above the fire for assisting in the combustion of the fuel therein.

In the drawings, 1 indicates the exterior wall of the oven, usually formed of brick-work and having hollows or cavities 2, filled with a suitable non-conducting substance—such, for example, as an asbestos composition—whereby the heat is held within the walls of the oven and the loss thereof by radiation is prevented as much as possible. By this means an economy in the use of fuel is attained, and also the bake-room is made much more comfortable, since the baker is not exposed to heat from the oven, except when the door of the baking-chamber is opened.

The oven is provided with a single fire-box 3, having an ash-pit 4 and arranged at the rear part of one side wall of the oven, so as to keep the front of the oven as cool as possible. A flue 5 leads horizontally across the rear part of the oven from the fire-box 3, and this flue has communication with two parallel flues 7 7, separated by a partition 6 at the center of the oven and extending forward one at each side of the oven center with their forward ends directed laterally in opposite directions, as shown at 9 9 in Figs. 3 and 9, and provided with doors 10, affording access to the flues for cleaning them when necessary. The laterally-bent forward ends 9 of the flues 7 extend to the side walls of the oven, where they connect with upwardly-extended flues 11, formed in said side walls and having their upper ends adapted for communication with opposite sides of a smoke-chamber 12, which extends across substantially the entire interior of the oven and is arranged with its floor inclined upwardly toward the rear of the oven, as shown in Figs. 4 and 8. Doors 12^a at the front of the oven afford access to the smoke-chamber 12 to permit it to be cleaned when necessary.

At the rear of the oven the smoke-chamber connects with downflues 13 13 at opposite sides of the rear wall of the oven, being formed in the said walls. The lower ends of the downflues 13 connect with the rear ends of

forwardly-extending smoke-flues 14, which are inclined downwardly toward the front of the oven and are arranged outside of but parallel to and in substantially the same plane as the smoke-flues 7. The forward ends of the outer smoke-flues 14 are connected with upflues 16, formed in the side walls of the oven alongside of and adjacent to the flues 11. The upflues 16 connect at their upper ends with opposite ends of a transverse flue 17, extended across the upper parts of the oven near the front thereof, as shown in Figs. 4 and 8, and adapted for communication with a chimney or other smoke-outlet.

Between the smoke-chamber 12 and the lower parallel smoke-flues 7 and 14 is formed the baking-chamber 19, having an arched roof 20 and also arranged to extend across the entire interior of the oven, except at its forward part, where it is provided with front walls which converge toward the door, as shown in Fig. 6. Its floor is covered with tiling 18, and the flues 14 and 17 are also covered or roofed over with similar tiling. The roof 20 of the baking-chamber is supported by arched channel-irons or I-beams 21 set at their ends in the side walls of the oven and is formed of tiles 22 or the like having their edges engaged with the channels of the beams 21, as shown in Fig. 4. A layer of concrete is spread over the tiles, as shown at 23, in such a way as to close the joints of the tiles, and thus prevent the entry of gases from the smoke-chamber to the baking-chamber. The floor and roof of the baking-chamber are inclined similarly to the smoke-chamber. The roof of the smoke-chamber is flat and is supported on beams 24, extended from front to rear of the oven, and on these are laid transverse I-beams 25, which support tiles 26, similar to the tiles of the baking-chamber roof 20, and having over them a layer of concrete, as shown at 27, to prevent the escape of gases from the smoke-chamber to the bake-room.

The spaces beneath the flues 7 and 14 and between said flues and the baking-chamber, smoke-chamber, and flue 17, as well as a space provided at the top of the oven above the flue 17, are filled with suitable substances—such as sand, gravel, and the like—adapted to receive and retain or store the heat from the gases passed through the flues and smoke-chamber and to give off said heat gradually to the baking-chamber, so as to adapt the oven for baking in a continuous manner for a considerable time after the fire in the fire-box 3 has been allowed to die out.

A door 28 at the front of the baking-chamber affords access thereto, and a lamp 29 and pyrometer 30 are provided for illuminating the baking-chamber and for indicating the temperature thereof. At the back wall of the baking-chamber is a flue or upwardly-extended passage 31, leading therefrom up above the smoke-chamber 12 and connecting at its upper end by way of a flue or passage 32 with the

cross-flue 17, leading to the chimney. A damper 33 is provided, as shown in Fig. 10, being held on a rod 34, extending to the front of the oven and adapted to be manipulated to cut off or regulate the flow of air from the baking-chamber through the passages 31 and 32 to flue 17, and thereby to regulate the temperature at which the baking-chamber is held. Dampers 16^a are also provided at the upper ends of the flues 16, as shown in Fig. 10, being arranged where the said flues connect with the cross-flue 17, and said dampers are held on rods 16^b, also extending to the front of the oven and adapted for movement in adjusting the dampers to cut off entirely or to regulate the passage of the gases through the flues 16 to the flue 17, leading to the chimney. A door or damper 35 is also provided in the front of the oven and communicating with the flue 17 to permit of ventilating the bake-room by the aid of the draft up the chimney.

To permit of supplying steam to the baking-chamber, I provide at each side of the oven-front water-tanks 38, having pipes 39, provided with cocks and leading through the front wall of the oven into metallic boxes or casings 36, which have pipes 37, leading to the baking-chamber and adapted to discharge steam thereinto. The boxes or casings 36 form generators and are located at the flues 11 and receive heat therefrom to vaporize the water admitted to the generators by way of pipes 39. The intense heat imparted to the generators is such that the water is converted into highly-superheated steam, which being admitted without cooling to the baking-chamber gives the best possible results.

The fire-box preferably employed in connection with the improved oven is shown in Figs. 2 and 11, being provided with air-ducts 40, arranged along opposite sides of its upper part. These ducts open, as seen in Fig. 2, at the outside of the oven-wall, where they are provided with dampers 41 to regulate the admission of air to them. The walls of the ducts, which form portions of the side walls of the fire-box, are, as shown in Fig. 11, provided with openings 42 to supply air to the fire-box from the ducts. By this means air is supplied to the fire-box above the burning fuel, so as to create a regenerative action and assist in the combustion of the fuel, and an important advantage is attained owing to the improved combustion and the ease with which the fire may be controlled by means of the dampers 41.

In operation the gases and flames from the fire-box 3 are drawn into the flue 5, and by the central partition 6 are divided, a part passing through each flue 7. To prevent a greater part of the flames and gases entering the flue 7 nearest to the fire-box, the mouth of that flue is contracted, as shown at 8. The flames and gases pass through the flues 7 to the front of the oven, where they are deflected laterally and passed up through flues 11 into the smoke-chamber, where they

are united and allowed to spread out through the entire chamber, so as to heat as much as possible the entire baking-chamber. At the rear part of the smoke-chamber the gases are again divided, a part thereof entering each downflue 13, from which it is discharged into the corresponding flue 14 and passes thence to the flue 17 by way of the upflue 16. The floor of the baking-chamber being inclined upward from front to rear, insures an even and uniform heating of said chamber from the flues 7, which by such inclination are caused to approach more closely to the said floor as the flames and gases passing through them lose their heat. The inclination downward of the flues 14 from rear to front also serves to retard the passage of the gases through them, and thus to utilize a greater part of their heat for the baking process. When the oven has been sufficiently heated, the fire may be allowed to die out, the dampers 16^a being closed to hold as much as possible of the heated gases in the oven-flues, after which the baking may proceed in a substantially continuous manner until the oven has again become cool.

The construction of the oven with the flue arrangement herein set forth is especially useful in bake-ovens, owing to the uniformity with which the heat is imparted to the baking-chamber and to the ease and convenience with which the oven may be managed, and it will also be obvious from the above description that the improved oven is capable of some modification without material departure from the principles and spirit of the invention, and for this reason I do not wish to be understood as limiting myself to the precise form and arrangement of the several parts of the device as herein set forth.

Having thus described my invention, I claim—

1. An oven having a baking-chamber, a smoke-chamber above the baking-chamber, a fire-box and two pairs or sets of flues extended beneath the baking-chamber, the flues of one pair or set being arranged to receive the products of combustion from the fire-box and to discharge them into the smoke-chamber, and the flues of the other pair or set being arranged to receive the prod-

ucts of combustion from the smoke-chamber and to discharge them to a chimney, dampers controlling the last-named pair or set of flues, the oven being also provided with a passage leading from the baking-chamber and adapted for communication with a chimney, and a damper controlling said passage; substantially as set forth.

2. An oven having a baking-chamber, a smoke-chamber above the baking-chamber; a fire-box and two pairs or sets of flues extended beneath the baking-chamber, the flues of one set being arranged to receive the products of combustion from the fire-box and to discharge them into the forward part of the smoke-chamber and the flues of the other set having an inclination downward from rear to front of the oven and being arranged to receive the products of combustion from the rear part of the smoke-chamber and being adapted, at their forward ends, for communication with a smoke-outlet, substantially as set forth.

3. An oven having at its central part a baking-chamber and provided with a fire-box, a smoke-chamber above the baking-chamber and parallel flues arranged in two sets below the baking-chamber, the flues of one set being arranged to receive the products of combustion from the fire-box at their rear ends and having their forward ends extended laterally and upwardly past the sides of the baking-chamber and adapted for communication with the smoke-chamber and the flues of the other set having their rear ends provided with upwardly-extended portions which pass up beyond the baking-chamber and are adapted to receive products of combustion from the smoke-chamber and having at their forward ends laterally and upwardly extended portions which pass up at opposite sides of the baking-chamber and are adapted for communication with a smoke-outlet, substantially as set forth.

Signed by me at Cincinnati, Ohio, this 7th day of May, 1900.

WILLIAM CLAUSS.

Witnesses:

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G. K. CONNELLY.