

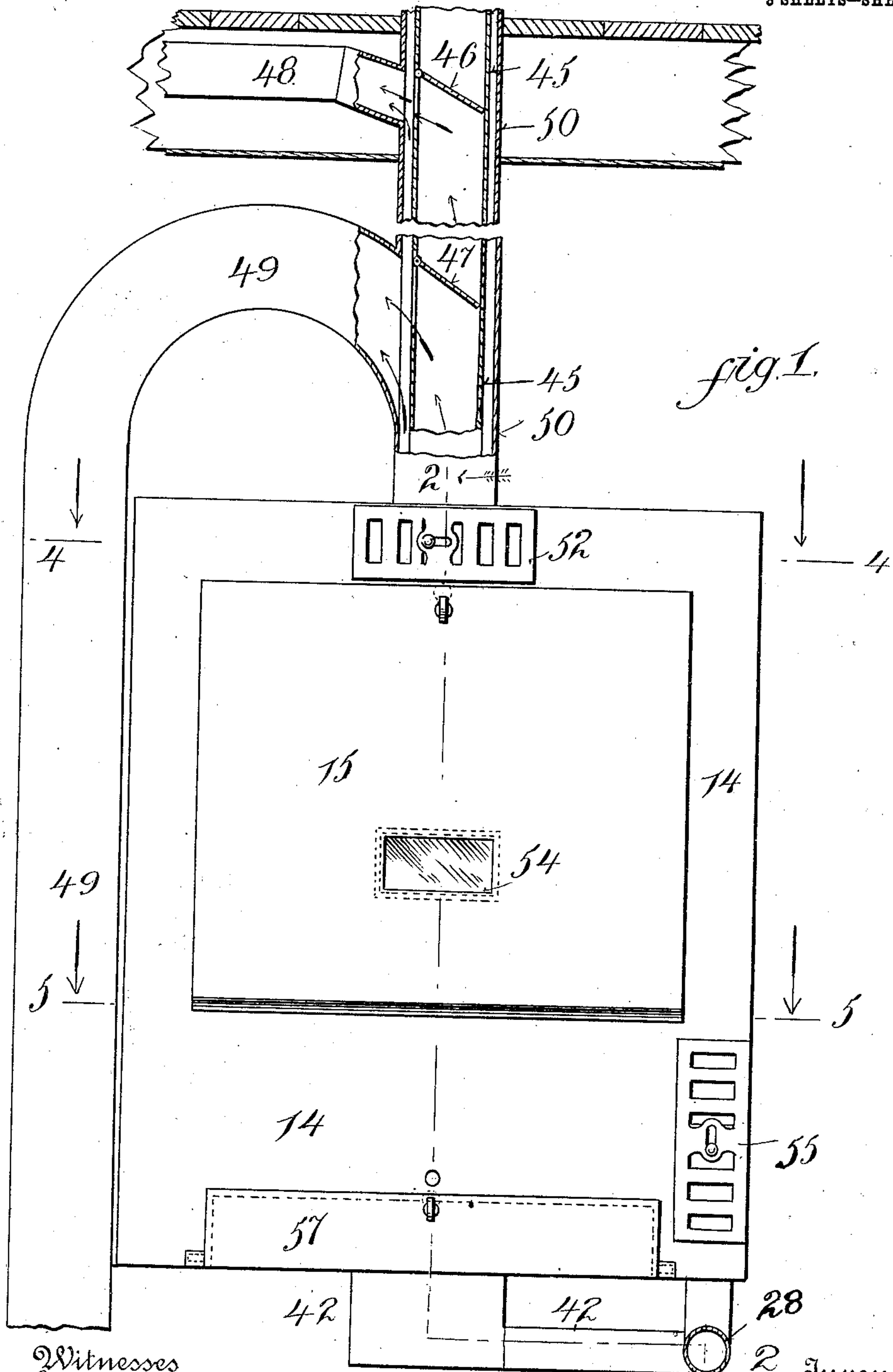
W. S. HAMILTON.
HEATER.

APPLICATION FILED AUG. 15, 1906.

924,771.

Patented June 15, 1909.

3 SHEETS—SHEET 1.



Witnesses
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By his Attorney
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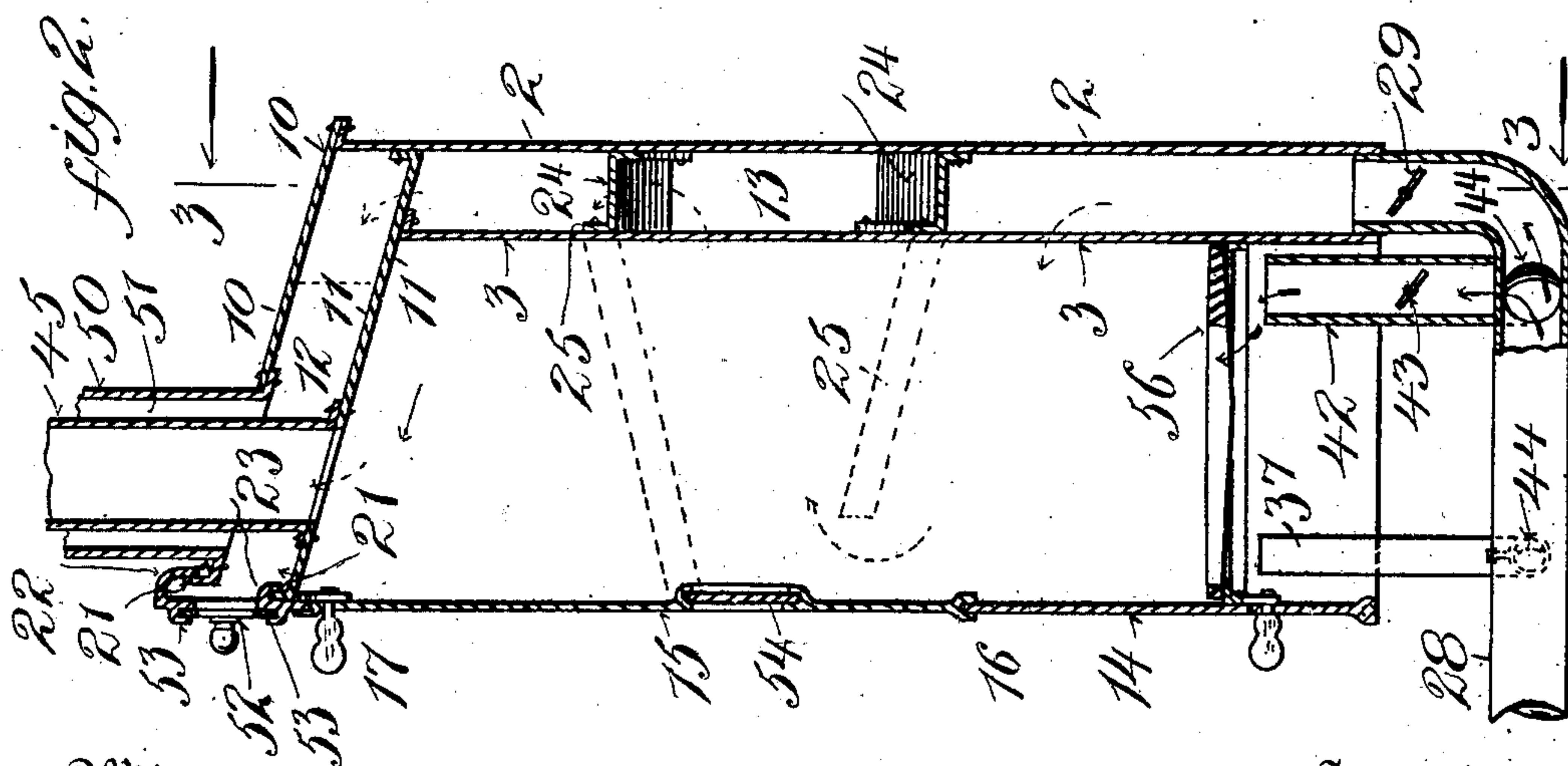
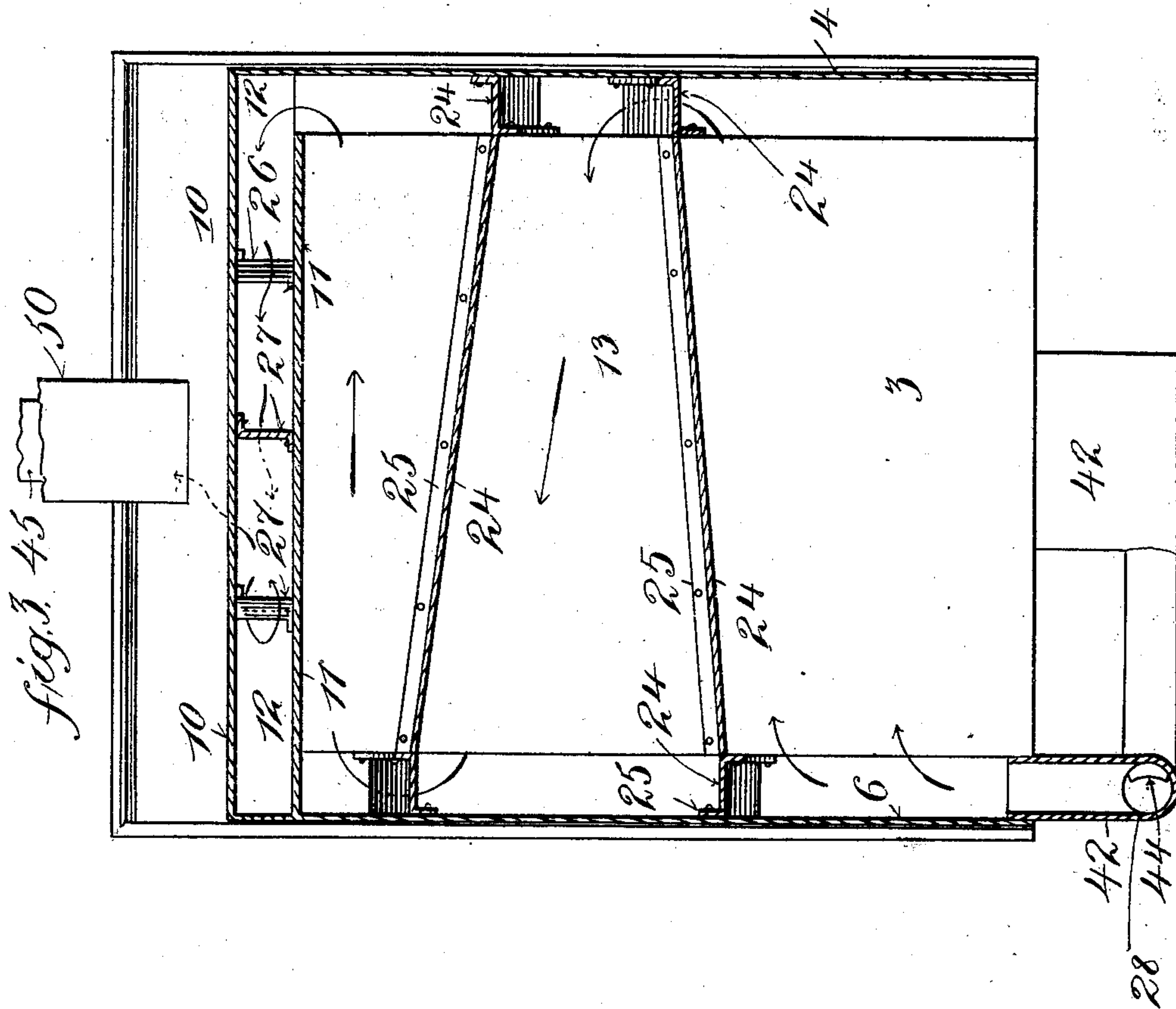
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3 SHEETS—SHEET 2.



Witnesses

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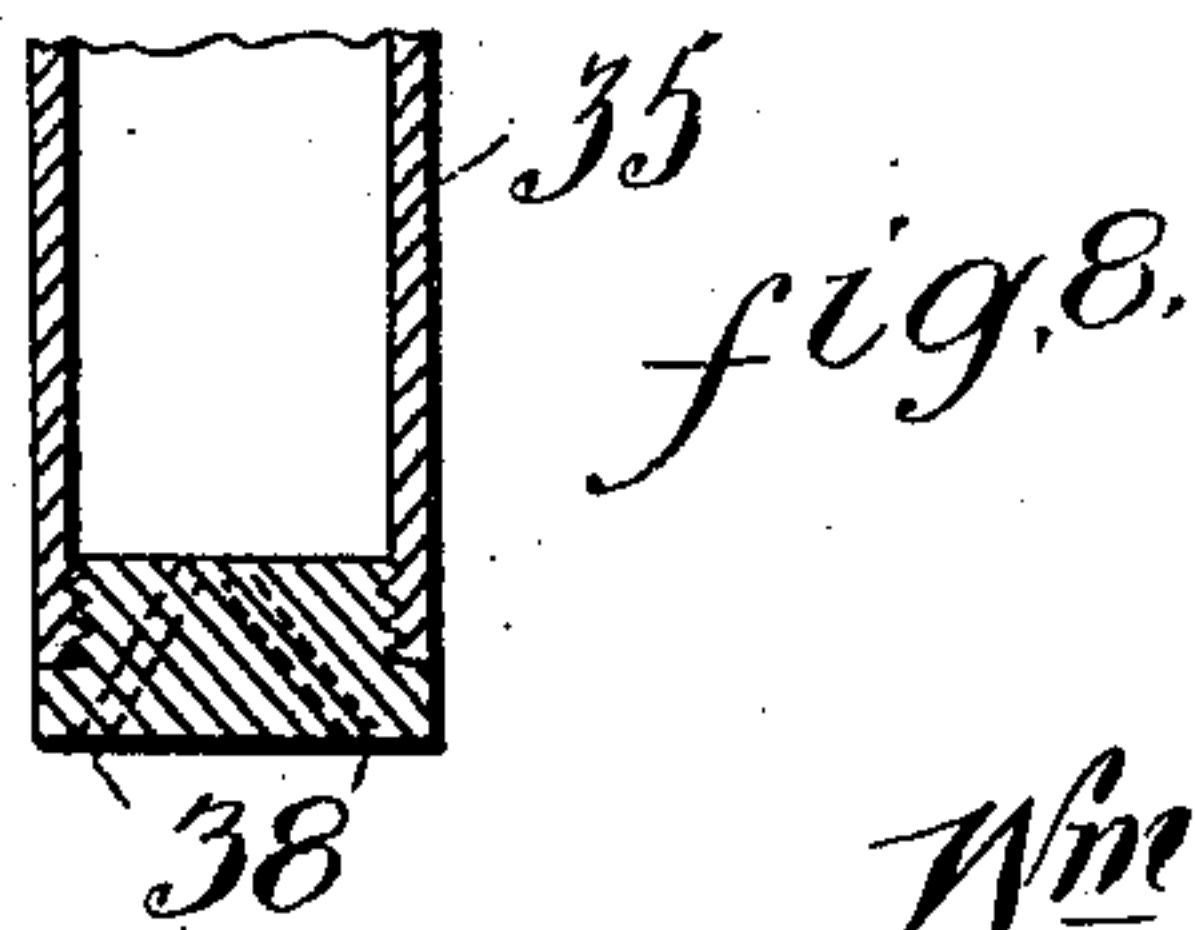
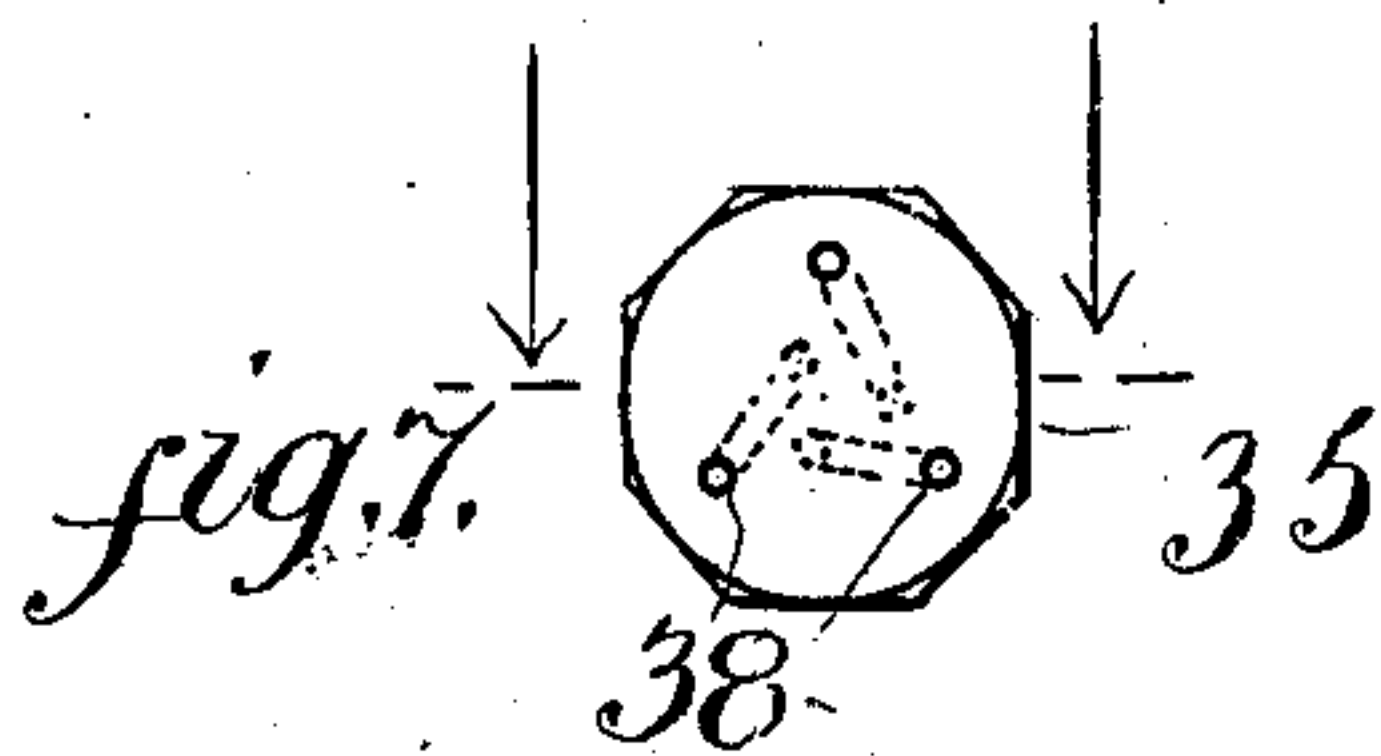
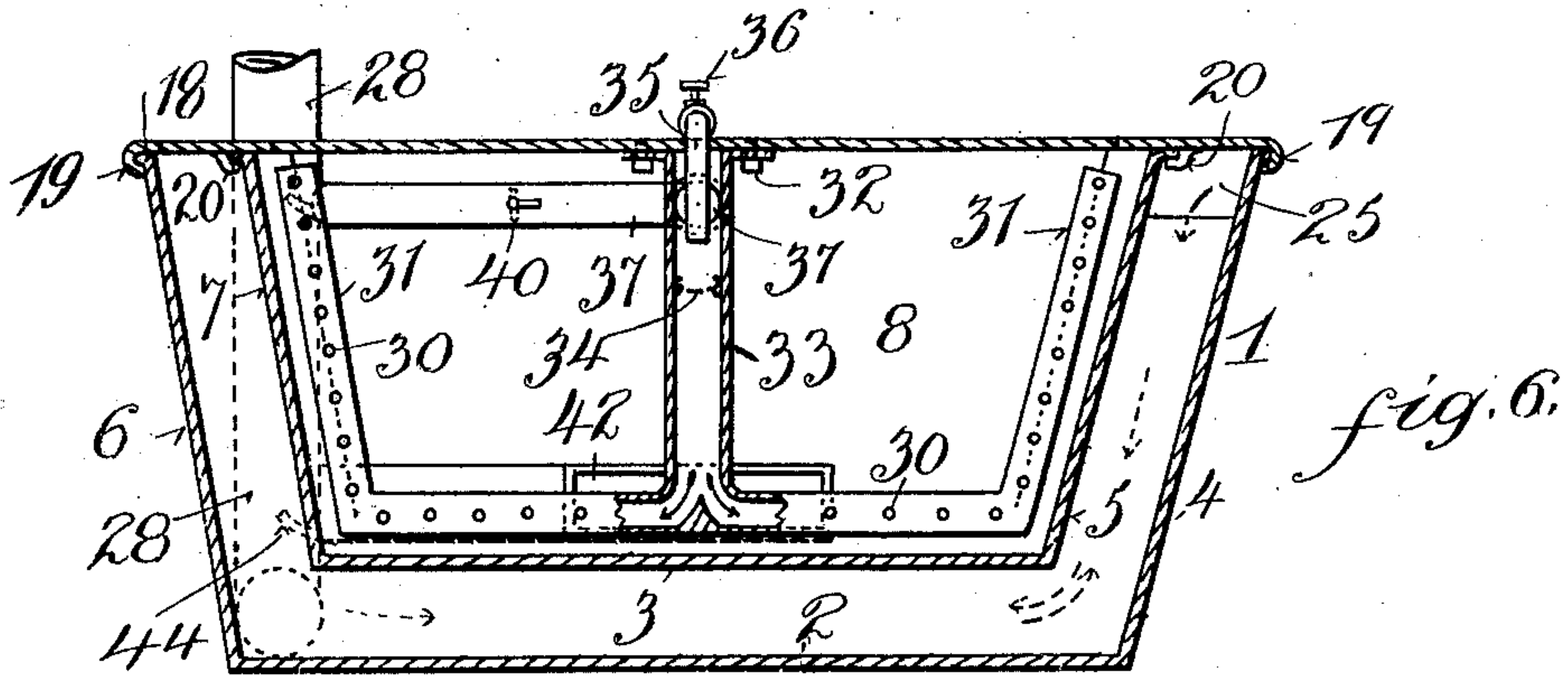
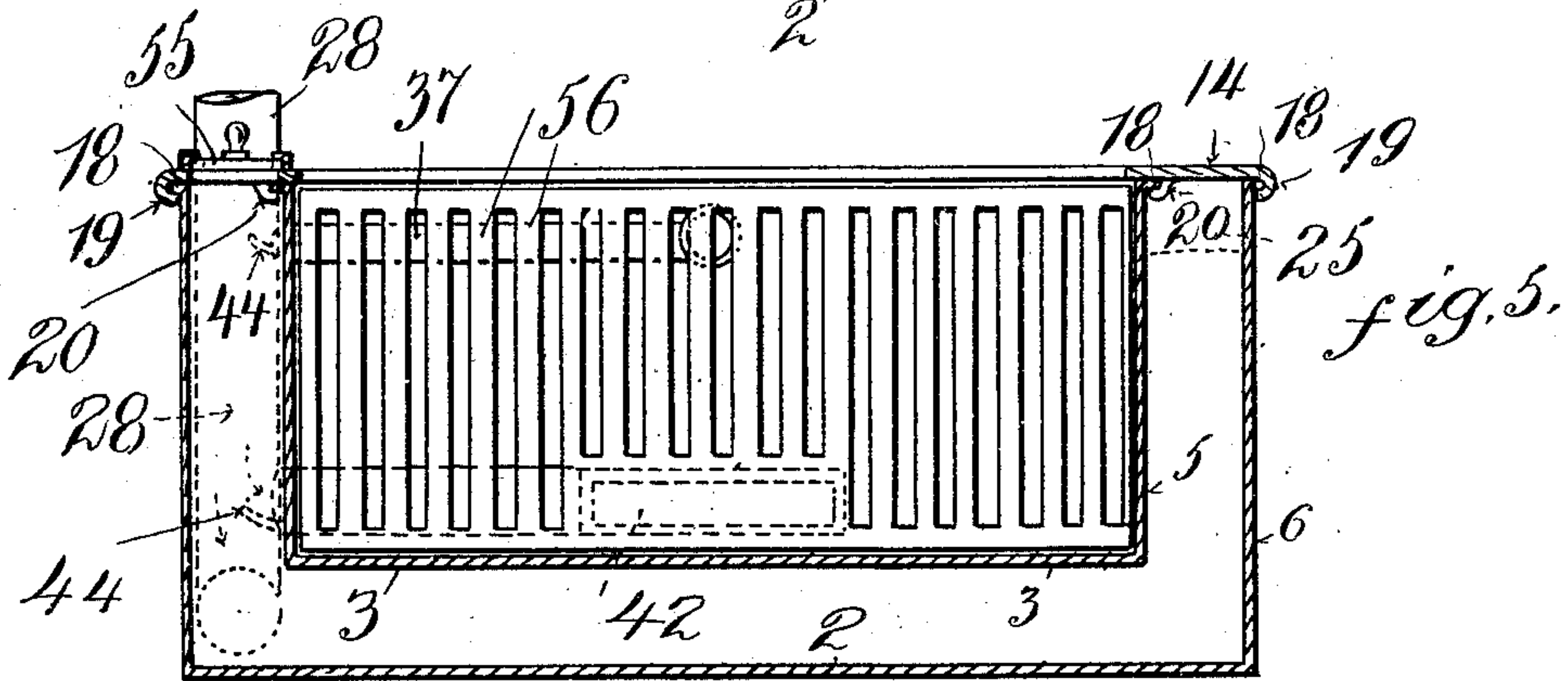
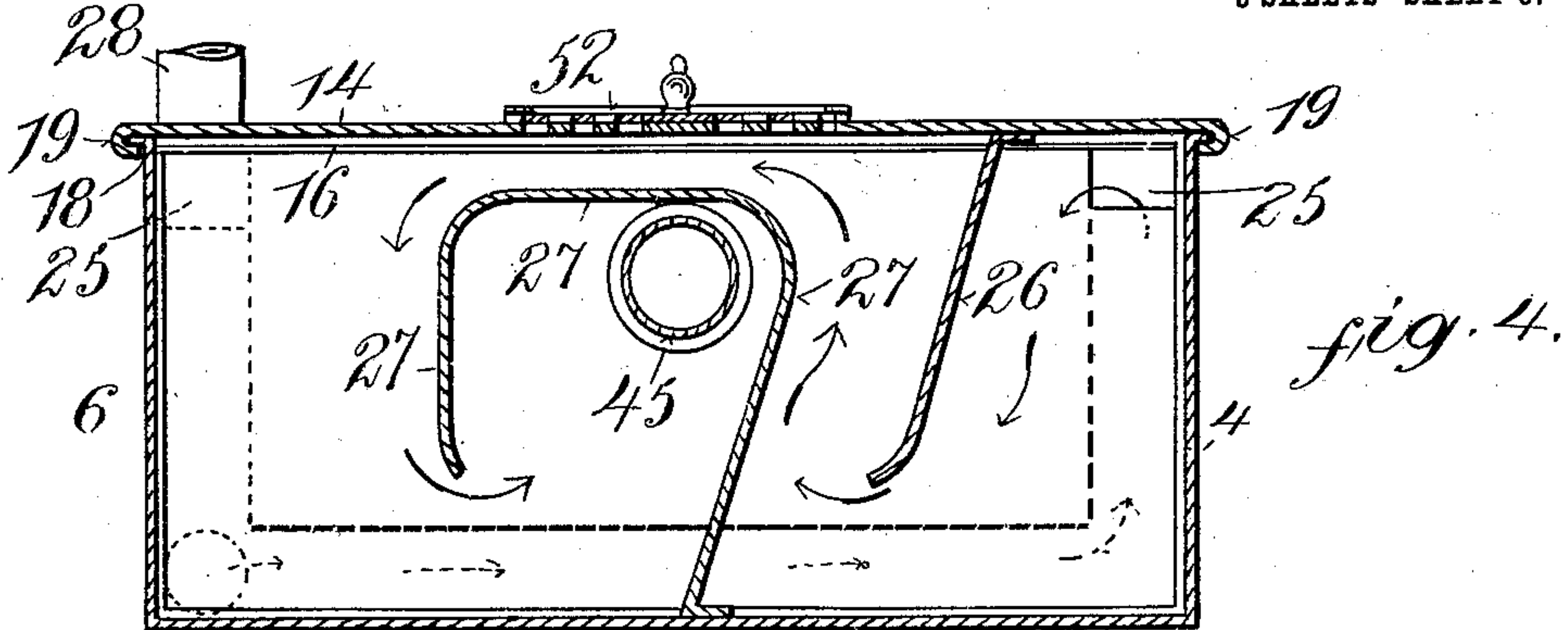
HEATER.

APPLICATION FILED AUG. 15, 1906.

Patented June 15, 1909.

3 SHEETS—SHEET 3.

924,771.



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UNITED STATES PATENT OFFICE.

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TO BYRON RUTLEY, OF OAKLAND, CALIFORNIA.

HEATER.

No. 924,771.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed August 15, 1906. Serial No. 330,628.

To all whom it may concern:

Be it known that I, WILLIAM S. HAMILTON, a citizen of the United States, and a resident of the city of Oakland, State of California, have invented certain new and useful Improvements in Heaters, of which the following is a full, clear, and exact description.

The object of my improvements is to provide a simple and inexpensive heater, more especially adapted to be placed in the ordinary fireplace, and which will burn either coal, wood or gas, in such an economic way as to decrease the cost of heating considerably.

The heater is adapted to be fed by air from outdoors where the most oxygen is present, so as to increase the heating capacity, and also to provide a better force for circulation in the heater. This is a great advantage, especially in a climate like that of California. However, I provide a series of dampers so that if the exterior air should be too cold, or if for any other reason its use should not be desirable, the air of the room may be used in the heater instead.

The above advantages may be used for gas, and by substituting a coal or wood grate for the gas burner the same advantage may be used with coal or wood as a fuel.

The heater is formed of a double shell, so that a heating chamber is formed between them separate from the chamber where the burner is contained, and baffle plates divert the air in the chamber so as to cause it to follow a devious course while heating and then out into the room.

Various other improvements will appear hereafter, including a novel means for assembling the heater.

In the drawings forming part of this application: Figure 1 is a front elevation, partly in section, showing the system of dampers. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a horizontal section on the line 3—3 of Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 1, looking in the direction of the arrows. Fig. 5 is a section on the line 5—5 of Fig. 1. Fig. 6 is a horizontal section showing the use of the gas burner. Fig. 7 is a plan view of the gas tip, and Fig. 8 is a vertical section of same in the pipe end.

The heater consists, primarily of a double shell which has an interior combustion chamber where the gas or other fuel is consumed, and between the two jackets is a chamber

provided with plates which direct the flow of air which is to be heated between the jackets. The heater therefore is composed of a body 1 which comprises a back wall 2, an interior rear wall 3, end wall 4 and 6, and interior end walls 5 and 7, whereby there is formed a continuous chamber between the exterior walls 6, 2, and 4, and the interior walls 7, 3, and 5, for the circulation of air which is to be heated and then discharged in the room where the heater is placed or carried by pipes to any desired point. The shell thus formed is preferably smaller at the rear than at the front, or converging, so as to conform to the conventional fireplace. This also forms an interior chamber 8, the details of which will appear hereafter. There is also provided a double top consisting of an outer plate 10, and an inner one 11, which form a chamber 12, connecting with the chamber 13 between the sides and ends. The sides, ends and bottom are preferably secured together by rivets.

There is a front plate 14 which closes the front of the heater and it is provided with a door 15, which has a bifurcated edge 16, adapted to engage the plate 14, and is held in place at the top by an ordinary catch 17. As there is a double wall shell and both should be in proper contact with the face plate so that the outer chamber will be inclosed as well as the combustion chamber (except when dampers are opened as will appear hereafter), I have devised a novel and simple construction whereby the front may be slid in place so as to be removable and yet form a good joint with each wall and top of the shell. As will be seen in Fig. 6, the ends are each provided with a flange 18 extending at right angles to the end plates. The front plate 14 is provided with overturned edges 19 which overlap the flanges on the outer end plate, and it is also provided with overturned flanges 20 which engage the flange on the inner end plates, thus forming a joint with each end plate. To provide a proper joint for the two top plates, I provide flanges 21 on the latter and an overturned edge 22 on the front plate as well as an overturned flange 23, each of which engages the flange of one of the top plates. As the front slides down into place, it is necessary to offset the edge and flange of the upper top plate as shown in Fig. 2, so that the flange 23 can pass the edge of the upper top plate and then engage on the flange below. The flanged edge 22 is

spaced sufficiently from the plate to allow for engagement with the offset edge of the upper top plate. There is thus formed a proper joint with the end and top walls, and the front is also removable.

There is provided between the two shells a series of plates 24, which I will call baffle-plates. They are preferably Z-shape in cross section and have one flange secured to the outer shell and the other to the inner shell so that the intermediate web completely blocks the space between the shells. These baffle-plates are preferably on an incline, are arranged one above the other, and horizontally disposed, reaching from the front plate around the entire shell and coming again to the front plate on the other side. These plates are slightly cut away at 25 on alternate ends so that the air when coming up from the feed below, will be compelled to travel in a zig-zag direction around the various baffle-plates, all the time being in contact with the inner heating shell. For a similar purpose there are provided between the two tops 10 and 11, similar plates 26 and 27, the latter extending around the pipes. The opening 25 of the top plate 24 finally allows the air, after zig-zagging around the plates 24, to pass between the top plates where it is then compelled to travel in a devious course by the plates 26 and 27 until it finally passes out through the pipes. The air to be heated in these irregular chambers I prefer to supply from outdoors since it is much richer in oxygen and therefore better to heat. For that reason I provide a large air supply pipe 28 which comes from outdoors and has one end extending to the rear of the heater and then upturned at 29 where it feeds air into the chamber between the two shells, when it will take the course described, and as shown by the arrow.

When using gas as a fuel there is a series of burners 30, consisting of holes in a burner pipe 31. The latter is secured to the front plate by bolts 32 in the single pipe 33 opposite a corresponding aperture in the front plate and extends rearwardly where it branches into the pipe 31, having the burner holes. Inside the pipe 33 I provide a gauze 34 to prevent flash-backs. The burner is a novel and important part of my improvements and may be used separately, though it is particularly adapted for this heater. My object is to so connect the burner that it will exclude the room air and use air brought directly from outdoors, so that the best possible and uniform combustion can be had. For this purpose I connect the end 35 of the gas feed pipe, which is governed by a cock 36, by passing it through a tight aperture in the front plate, when it enters into the pipe 33 which is larger, and passes beyond an air feed pipe 37. This burner is provided with a tip 38 which is shown in Figs. 7 and 8. It con-

sists of a tip having oblique apertures 39 therethrough which sends the gas in contact with the pipe 33. The pipe 37 is an air supply pipe connected with the main pipe 28 so that outside air is admitted directly behind the burner into pipe 33, as is shown in Fig. 6. A damper 40 is provided in the pipe 37. It will be seen that the air used for combustion is taken from outdoors and is not affected by the quality of the air in the room, so that there is always sufficient oxygen to furnish the best combustion.

For the purpose of supplying air to the combustion chamber 8, I provide a supply pipe 42 which is connected to the pipe 28 and extends to the middle of the bottom where it opens into the combustion chamber. This pipe is also provided with a damper 43 for regulation.

It will thus be seen that air from outdoors is supplied for heating, for the combustion chamber, and for mixture with the gas in the burner, which increases the efficiency of the heater. Projections 44 are provided on the pipes 42 and 37, which extend into the pipe 28 and direct the air into their respective pipes.

There is secured to the top plate 11 a pipe 45 which connects with the combustion chamber and is adapted to receive the air therefrom. This is adapted to direct the heat (when gas is used), to the desired point, and when coal or wood is used, it carries off the smoke, the dampers 46 and 47 serving to direct the heat through pipes 48 and 49 when gas is the fuel. When coal is used, the dampers are closed and the smoke continues through the pipe 45. Another pipe 50 surrounds the pipe 45 and is secured to the top plate 10, so that there is a space 51 between them where the heated air from the shell chamber is discharged. The branches 48 and 49 are connected with the pipe 50 and carry the hot air to wherever desired. The pipe 49, it will be seen, passes down below and may serve to carry heat below the floor. I believe my heater is the first to heat successfully below the floor where it is situated, owing to the system of draft regulation.

It might be desirable to utilize the air of the room, in certain cases for the heating, and it might also be desirable to direct the heat from the heater without passing through the upper pipes, so I have devised a series of dampers for that purpose. In the top of the front plate I provide an ordinary slide damper 52, which is held in place by flanges 53. When this damper is opened the heat from the shell or jacket chamber comes directly into the room. In the door I provide a window 54. Another damper 55 is provided in the lower part of the front plate which will let room air into the combustion chamber when desired.

If coal is to be used, instead of gas, the

pipes 30 and 33 are lifted out and an ordinary grate 56 is substituted (see Fig. 5). The pipe 37 may be then used as a draft pipe for the front of the stove, while the pipe 42 serves a similar purpose at the rear.

While I have described one embodiment of my invention in detail, I do not wish it to be understood as a limitation upon the scope of the following claims.

10 Having described my invention, what I claim is:

1. A heater comprising a plurality of jackets forming a combustion chamber, a heating chamber formed about the combustion chamber by the spacing apart of the said jackets, and a series of inclined baffle-plates, between said jackets having their alternate ends cut away so as to form communications between the several intermediate spaces be-
20 tween the baffle-plates whereby the air will be carried in a devious course through the heating chamber, and means for supplying outdoor air to the heating chamber.

2. A heater comprising a plurality of jackets forming a combustion chamber, a heating chamber formed by the spacing of the said jackets, a pipe for receiving the discharge from the combustion chamber, a pipe for receiving the discharge from the heating chamber, and means whereby the contents of said first pipe may be directed into the same in-
30 closure as the contents of said second pipe.

3. A heater comprising a plurality of jackets forming an interior combustion chamber, a heating chamber formed by the spacing of said jackets, a pipe connected to the interior jacket for receiving the contents of the combustion chamber, and a second pipe surrounding the first pipe, connected to the
40 outer jacket and adapted to receive the discharge from the heating chamber and a damper in the first pipe whereby the first pipe may be opened into the second and its contents directed therein instead of continuing
45 in the said first pipe.

4. A heater comprising a plurality of jackets spaced apart to form a heating chamber, the jackets forming an interior combustion chamber, a pipe for admitting outdoor air into the lower part of said chamber, and pro-
50 vided with a damper, a pipe for carrying off the hot air from the top of the heating chamber and a damper near the top of the heating chamber for opening the same to the room.

5. A heater comprising a plurality of jack-
55 ets, a front plate therefor, flanges on the sides of said jackets and on the upper edges thereof, and means on the said front plate for gripping the said flanges of the jackets to form joints therewith. 60

6. A heater comprising a plurality of jackets, formed with a chamber between them and a face plate for closing the front of the heater, flanges on the end walls of the said jackets, flanges on the top walls of the jack-
65 ets, the uppermost being set back from the lower, and flanges on the said face plate engaging with the various flanges on the jackets to form joints therewith.

7. A heater composed of inner and outer
70 jackets, in which is formed an interior combustion chamber 8, a gas burner in said combustion chamber which is fed by a supply pipe, a pipe for mixing outdoor air with said gas before combustion, a pipe 42 for supply-
75 ing outdoor air to the combustion chamber, a pipe for supplying outdoor air to the heating chamber between the jackets, baffle-plates in the latter chamber, pipes for carrying off the discharge from the combustion
80 chamber and from the heating chamber, means whereby the same may be discharged through a common outlet, and a front plate for the heater having an upper and a lower damper for the said heating chamber.

Signed this 2d day of August, 1906.

WILLIAM S. HAMILTON.

Witnesses:

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BLANCHE V. MOHAN