

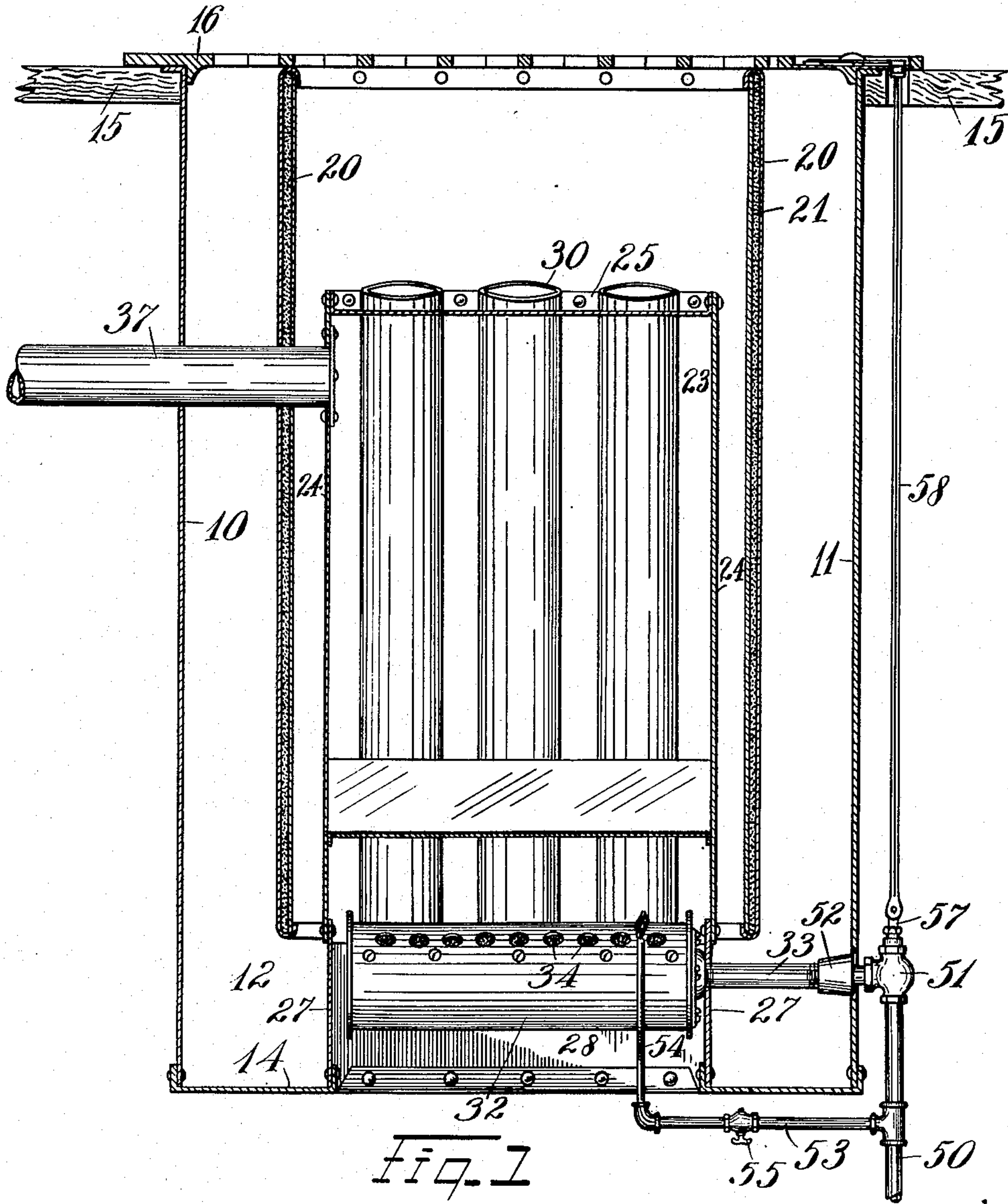
R. L. SHORT.
HOT AIR HEATER.

APPLICATION FILED SEPT. 23, 1907.

919,966.

Patented Apr. 27, 1909.

2 SHEETS—SHEET 1.



WITNESSES

J. B. Wilmore

Brennan & West

INVENTOR

Robert L. Short

By Bates Foulke & Hull

ATTORNEYS

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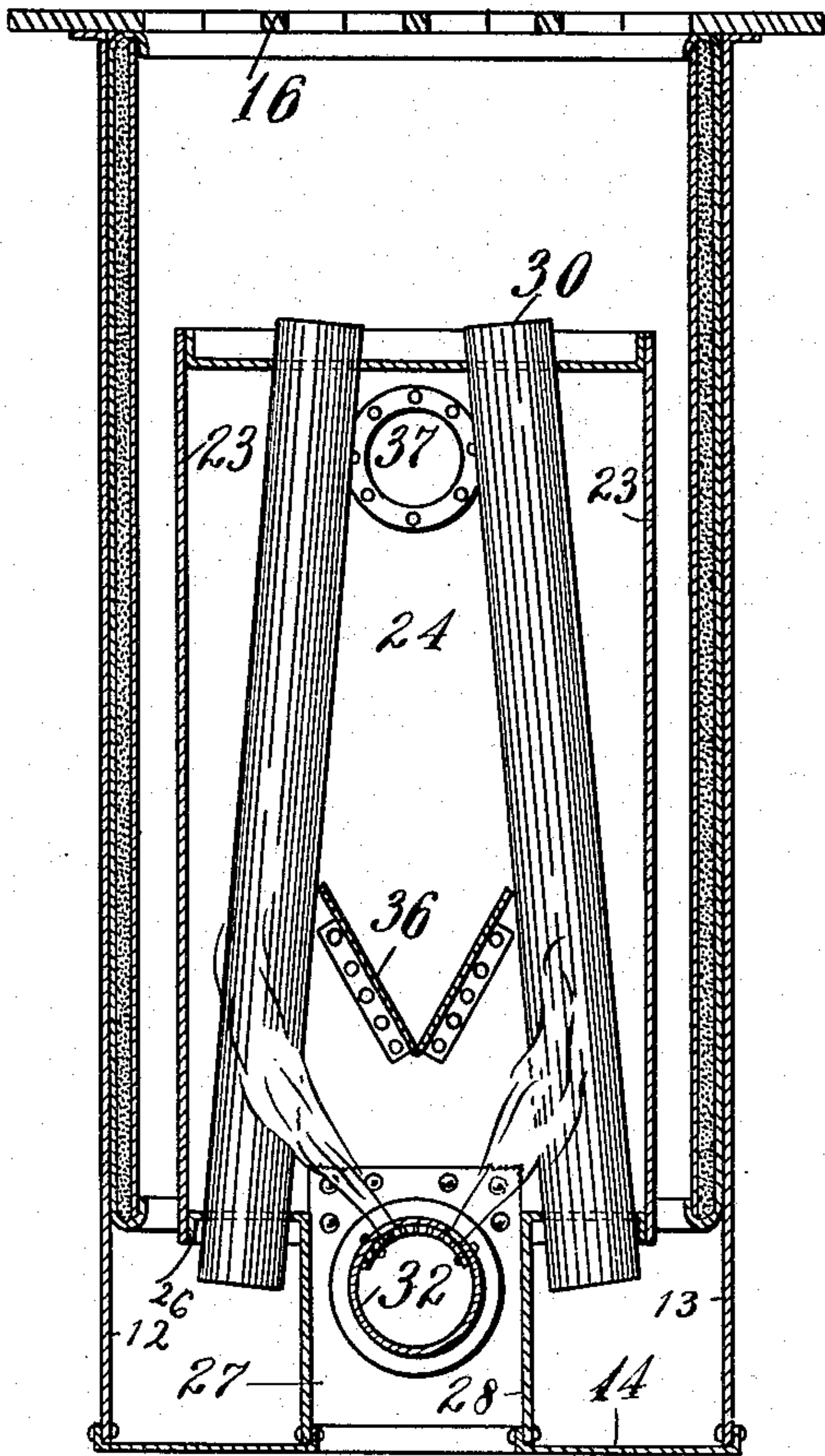


Fig. 2

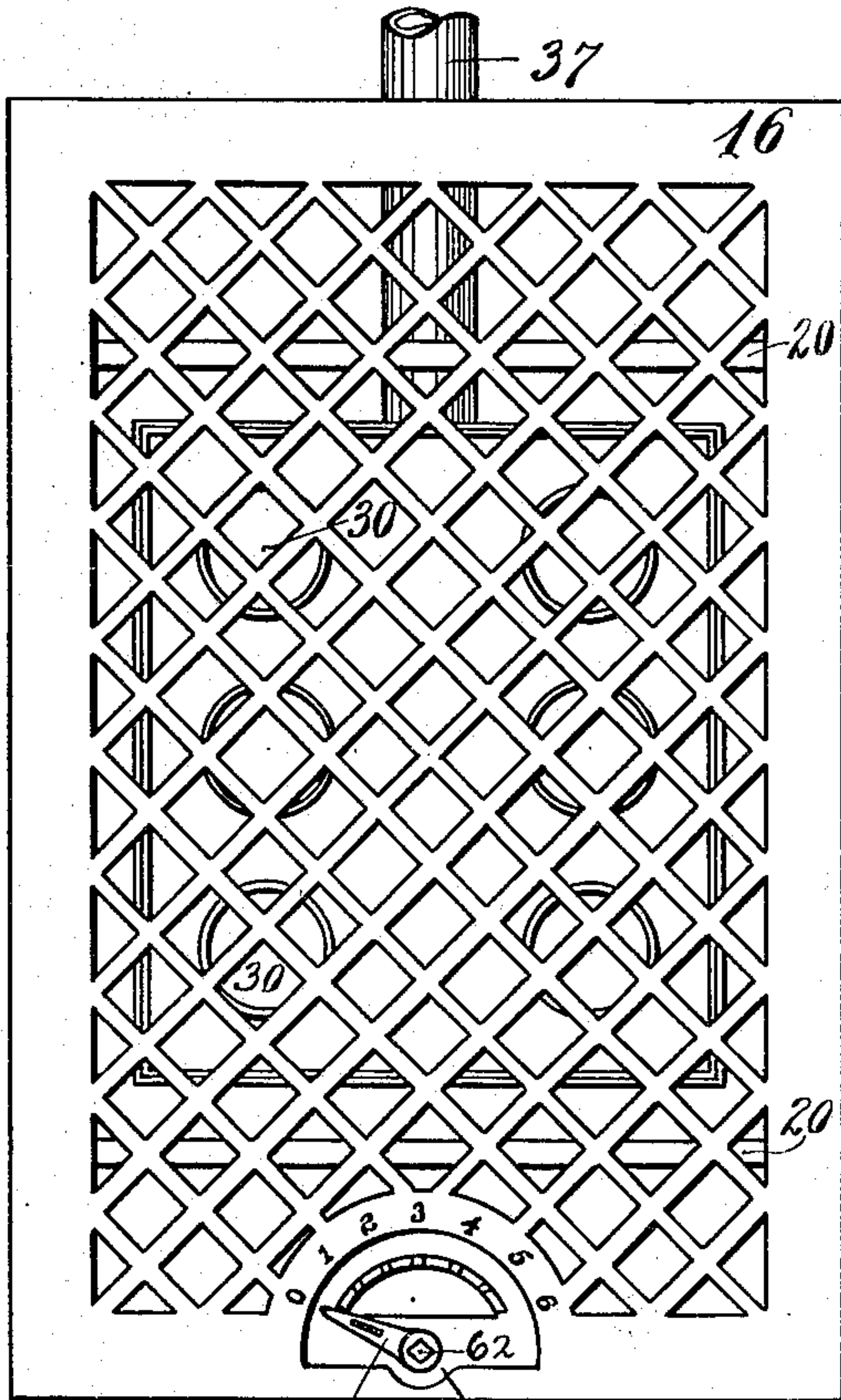


Fig. 3

WITNESSES:

F. C. Wilmore

Brennan West.

INVENTOR

Robert L. Short,

By Dale Gault & Hall,
ATTORNEYS

UNITED STATES PATENT OFFICE.

ROBERT L. SHORT, OF FOSTORIA, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO TOLEDO GAS FLOOR FURNACE COMPANY, OF TOLEDO, OHIO.

HOT-AIR HEATER.

No. 919,966.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed September 23, 1907. Serial No. 394,025.

To all whom it may concern:

Be it known that I, ROBERT L. SHORT, a citizen of the United States, residing at Fostoria, in the county of Seneca and State of Ohio, have invented a certain new and useful Improvement in Hot-Air Heaters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

10 The primary object of this invention is to provide in a simple and inexpensive form a very efficient hot air heater supplied by gas.

The invention is well adapted for embodiment in a floor heater wherein the heater is 15 depressed below the floor level, its upper surface being supported upon the floor and consisting of an open grate structure similar to that employed in an ordinary hot air register.

Another object is to so arrange the parts 20 that the danger of the flame being inadvertently extinguished is reduced to a minimum.

Another object is to keep the gas and products of combustion entirely separate from the hot air passageway so that the air is not 25 contaminated and even if the flame should be extinguished, no escape of gas into the room would result.

I accomplish the above objects by a floor heater constructed and arranged after the 30 manner illustrated by the particular embodiment shown herein, which will now be described.

The drawings show my floor heater in an approved form.

35 Figure 1 is a vertical section thereof lengthwise of the heater. Fig. 2 is a vertical section crosswise, being at right angles to Fig. 1. Fig. 3 is a plan.

Referring by reference numerals to the 40 drawings, 10 and 11 represent the ends and 12 and 13 the sides of a rectangular box or casing which has a bottom 14. This casing is preferably made of sheet metal. It has its upper end flanged outwardly, such flange being adapted to extend onto the upper side of 45 the floor to which the heater is applied, as illustrated by the boards 15—15 of Fig. 1. Resting on the floor is a grate 16 which may have downward lugs to hold it against displacement.

50 20 represents an inner vertical rectangular casing which is open at its top and bottom; it is preferably constructed of two thicknesses of metal with an interposed non-con-

ductor of heat, as asbestos, indicated by 21. 55 The opposite sides of this inner casing are riveted to the sides 12 and 13 of the outer casing. The other two sides or ends of the casing stand some distance from the plates 10 and 11 to leave air passageways between 60 them. Within the inner casing 20 is a metal box composed of sides 23, ends 24, a top 25 and a bottom 26. This box is in open communication at its lower end with the air space below the heater. This open com- 65 munication is provided by a downward extension of the box and consists of end walls 27 and side walls 28 which lead from an opening in the bottom of the box to a corresponding opening in the bottom plate 14 of the cas- 70 ing. The side walls 28 are shown as integral portions of the bottom 26 turned downward, the end walls being plates riveted to the ends 24 of the box.

Extending through openings in the top 75 plate 25 and bottom plate 26 are a series of hot air pipes 30. These pipes extend a short distance above the plate 25 and below the plate 26. They have open ends above and below. They are arranged in two series 80 on opposite sides of the central longitudinal plane of the heater and are inclined toward such plane as they extend upwardly, as shown in Fig. 2.

The gas burner is designated 32. It oc- 85 cupies the space near the bottom of the heater within the extension of the inner box and between the lower ends of the inclined pipes 30. This burner is supplied with gas and air from the pipe 33, the gas burning at 90 openings 34 arranged in two rows near the top of the burner. These two rows are on opposite sides of the central longitudinal plane of the heater and are so placed that the flames burning from the emitted gas 95 impinge directly on the inclined pipes 30 and encircle them, heating them to an intense heat. This course of the flames is augmented by the baffle 36 in the form of a V-shaped plate secured to the end plates 24. 100

37 indicates a pipe for the products of combustion which passes from the inner box near its upper end to the chimney, this pipe being shown as passing through the end wall 10 and the wall 20, and the wall 24, being 105 flanged and secured to the latter wall.

In operation, the cold air comes down from the floor of the room at the ends of the

radiator in the space between the ends 10 and 11 and the walls 20, and turns and passes up into the room within the casing 20, both outside of the inner box and through the pipes 30. These pipes and the walls of the box being intensely heated from the burning gas, the air is correspondingly heated. The products of combustion are kept entirely separate from the air admitted to the room.

The burner is so protected that the danger of its flame being blown out is reduced to a minimum. The downward draft of cold air does not come in contact at all with the burner and there is very little danger of any draft in the basement entering around the burner with sufficient force to blow out the flame. Should there be a break in the gas main, causing the flame to be extinguished, and the gas be again supplied without the valve being shut off, which might happen, the gas would pass harmlessly up the chimney through the pipe 37 and would not enter the room.

The gas is supplied from the main through a pipe 50. A suitable valve 51 connects this with the mixer 52 which has air openings and is connected with the pipe 33 leading to the burner. A pipe 53 connects with the pipe 50 and leads to a pilot burner 54. A suitable cock 55 in the pipe 53 controls the pilot burner. In normal usage the cock 55 is continually open and the pilot burner remains lighted at all times. The valve 51 has its stem 57 connected to an upright rod 58, the upper end of which is square and passes into a square socket in an arm 60 which occupies a depression 61 in the grate 16. The turning of this arm is therefore adapted to regulate the opening of the valve, and hence the amount of heat. The arm is shown as having its stem extending through the grate and carrying a collar 62 to prevent displacement. The socket of this arm fits loosely over the upper end of the rod 58 so that the grate may be removed whenever desired. A suitable lug 63 on the underside of the arm coöperates with notches 64 carried by the grate to hold the arm against accidental displacement, and a suitable lip 65 on the arm furnishes means for shifting it by one's foot. The arm is preferably extended to form a pointer and a series of numerals are provided, indicating the relative amounts the valve is opened.

With my heater under normal conditions, it is only necessary once a year to go into the basement and light the pilot, then the gas may be turned on to any desired extent by the operation of the arm 60, and immediately the desired amount of hot air is delivered into the room. The heater is economical of gas, due largely to the fact that the flames are brought into such intimate relation with the hot air conduits. The heat may be regulated as desired, or instantly shut off altogether.

I claim:

1. In a gas heater, the combination of a longitudinal gas burner, a heating drum, two rows of hot air pipes on opposite sides of the burner inclining toward each other upwardly and extending through the top and bottom of the drum, and a V-shaped baffle located above the burner and above the ends of the pipes and adapted to assist in directing the flames and hot gases around the inclined pipes.

2. In a hot air heater, the combination of a box having a downward extension, a series of open-ended inwardly inclined hot air pipes extending through the top and bottom of the box, a gas burner located in a downward extension of said box in communication with the space around said pipes, and a casing having a grating at the top and having an opening in the bottom surrounding the box, the casing supporting the said box and adapted to conduct cold air to the lower ends of said pipes.

3. In a hot air gas heater, the combination of an outer casing having a grate at its upper end, and an opening at its lower end, an inner casing leaving a cold air space between it and the outer casing, a box within the inner casing, downward walls from the bottom of said box to the bottom of the outer casing adjacent to the opening therein and forming an air passageway from beneath the casing to the interior of the box, a gas burner located in said passageway, and open-ended hot air pipes extending through the top and bottom of the box and arranged in two rows on opposite sides of the gas burner.

4. The combination of an outer casing, an inner casing providing a cold air passageway between the walls of the two casings, a box within the inner casing and providing a hot air passageway between it and the walls of the inner casing, open-ended hot air pipes extending through the top and bottom of said box, and a gas burner arranged to heat said hot air pipes and box.

5. The combination of an outer casing, an inner casing providing a cold air passageway between the walls of the two casings, a box within the inner casing having an extension and providing a hot air passageway between it and the walls of the inner casing, open-ended hot air pipes extending through the top and bottom of said box, and a gas burner in an extension of the box which is in open communication with the air outside the outer casing, said hot air pipes being arranged in two rows and the gas burner extending longitudinally between the rows.

6. In a gas heater, an outer casing closed at the bottom, there being an opening therein and a grating at its top, an inner box closed at the top and bottom, the bottom portion having an opening and flanges depending

from said bottom, said flanges registering
with the opening in the bottom of the outer
casing, pipes extending through the top of
the inner casing and through the bottom
5 thereof outside the central opening, and a V-
shaped baffle between the pipes and above
the bottom of the inner box.

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

ROBERT L. SHORT.

Witnesses:

JESSE STEPHENS,
BELLE BRANNAN.