

No. 829,859.

PATENTED AUG. 28, 1906.

E. E. EDWARDS & E. TURLEY.

TANK HEATER.

APPLICATION FILED DEC. 7, 1905.

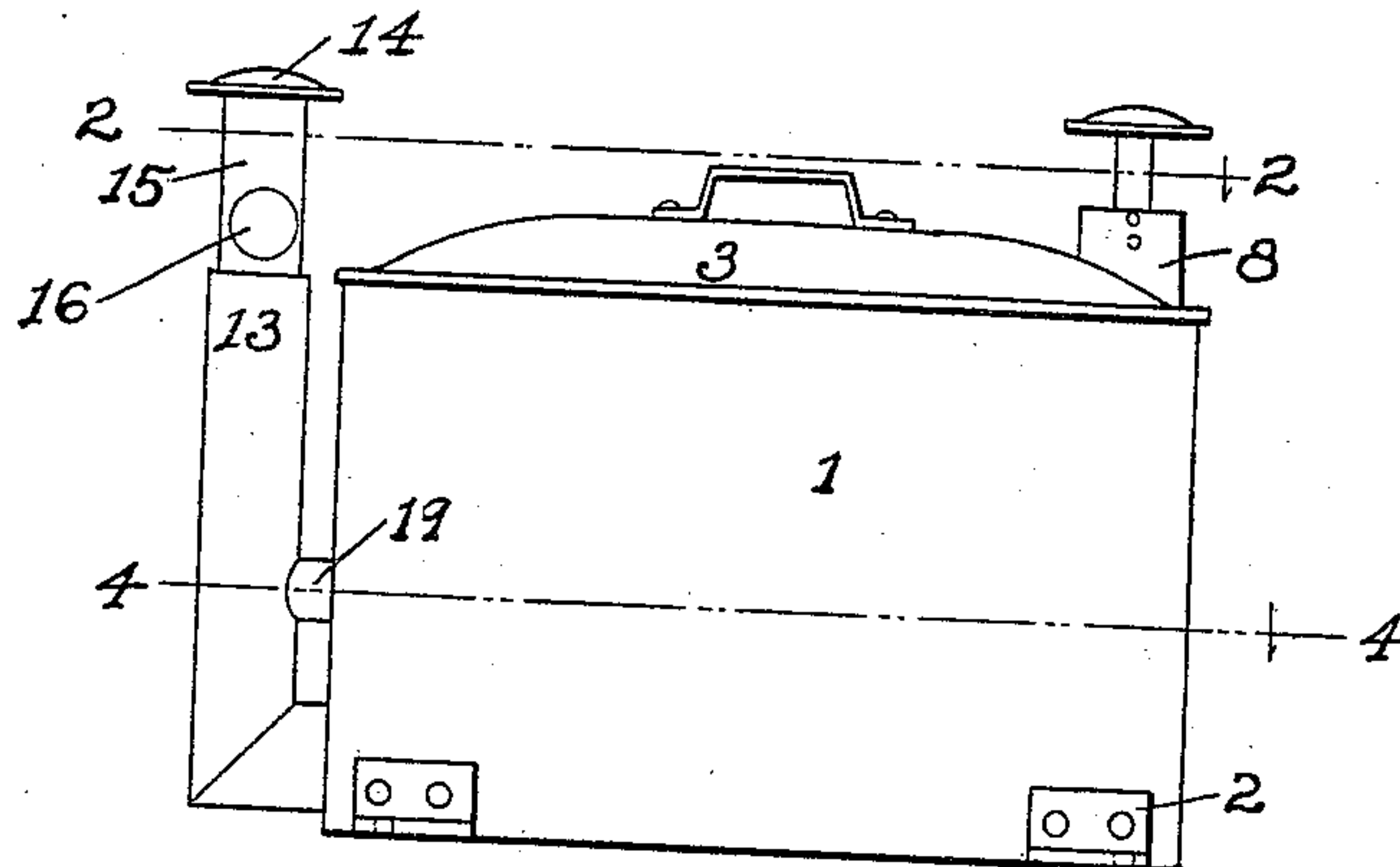


FIG. 1.

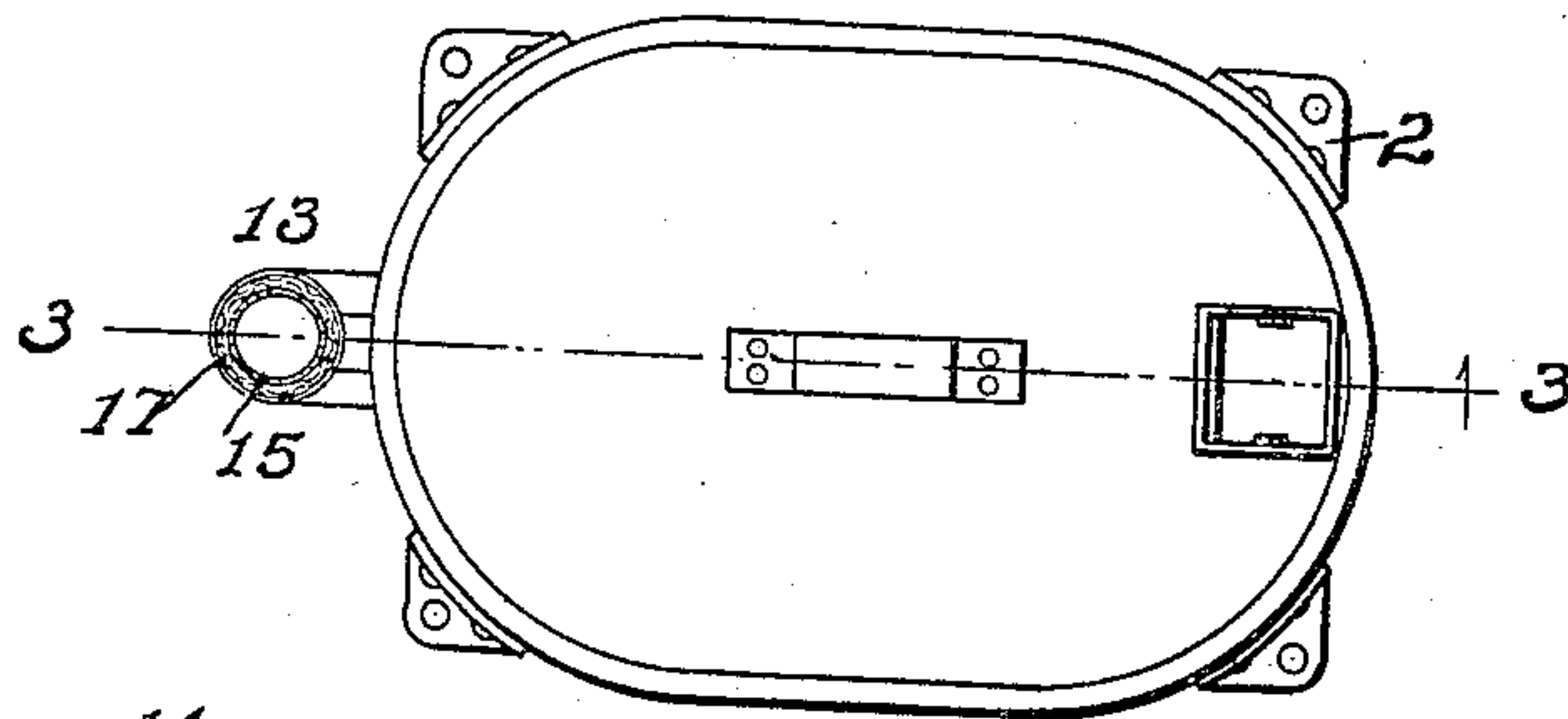


FIG. 2.

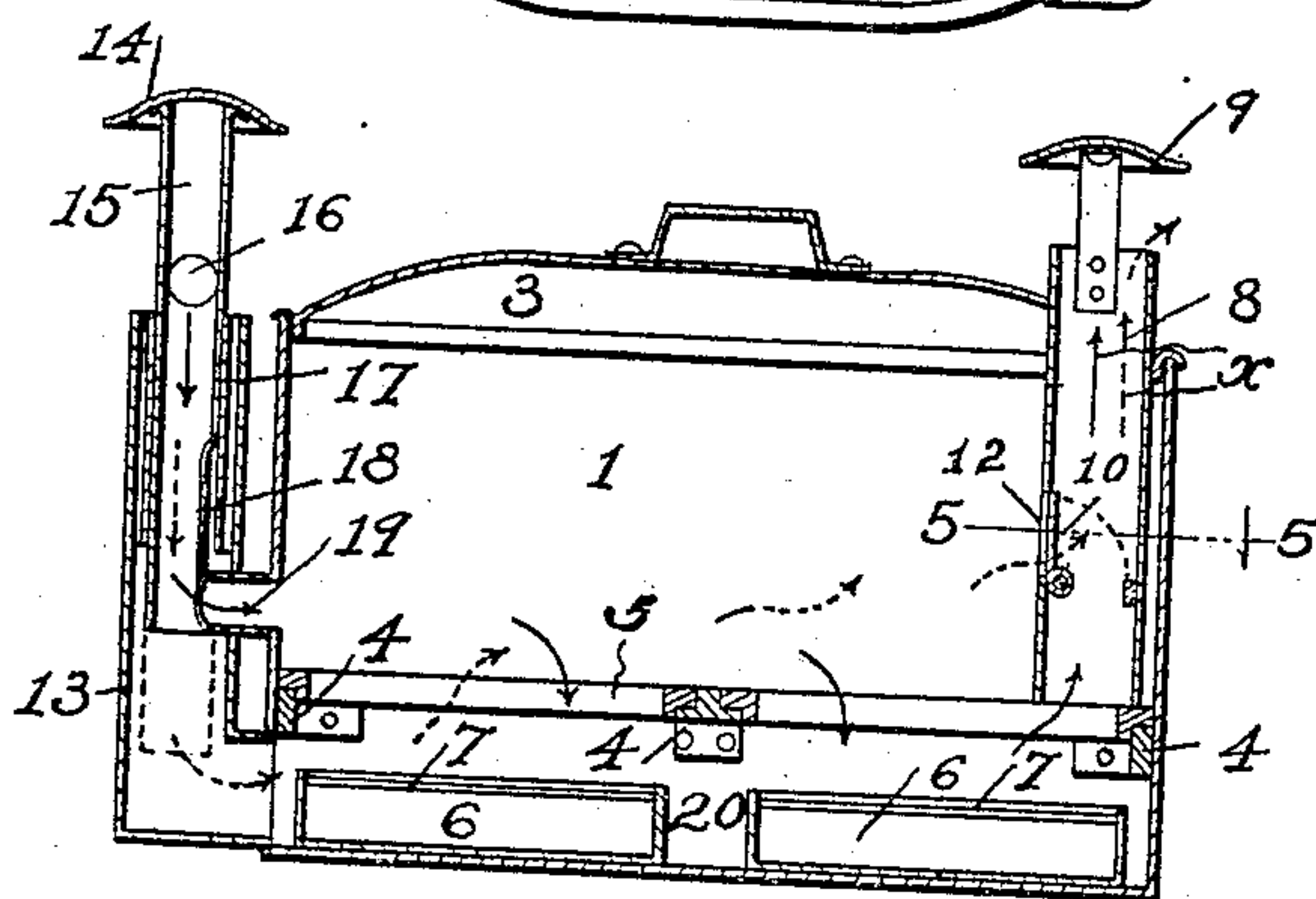


FIG. 3.

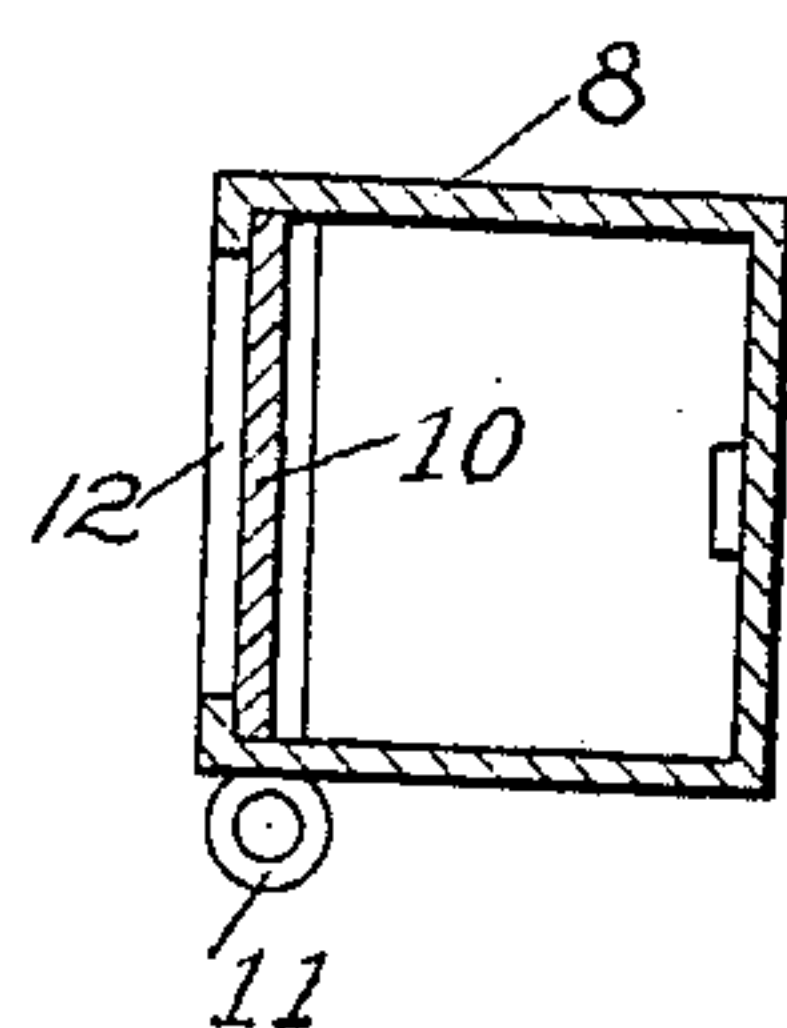


FIG. 5.

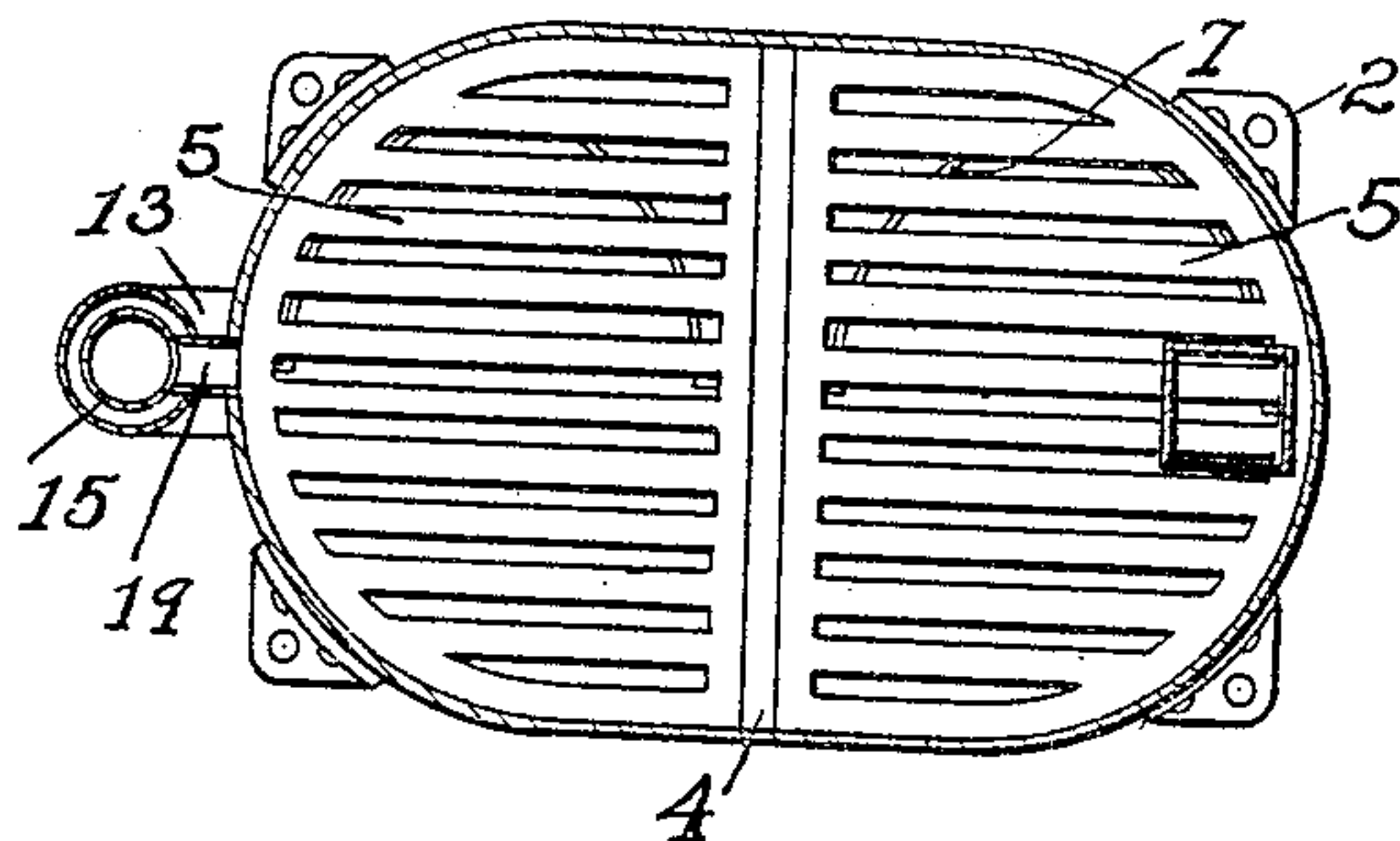


FIG. 4.

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UNITED STATES PATENT OFFICE.

ELMER E. EDWARDS AND ELMER TURLEY, OF MOUNT PULASKI, ILLINOIS.

TANK-HEATER.

No. 829,859.

Specification of Letters Patent.

Patented Aug. 28, 1906.

Application filed December 7, 1905. Serial No. 290,841.

To all whom it may concern:

Be it known that we, ELMER E. EDWARDS and ELMER TURLEY, citizens of the United States, residing at Mount Pulaski, in the county of Logan and State of Illinois, have invented certain new and useful Improvements in Tank-Heaters, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use our said invention.

Our invention relates to heaters such as are used in tanks supplying water for stock to prevent freezing of the water in the tanks.

The purposes of our invention are to provide a heater adapted for partial immersion in water, also adapted to use either coal, cobs, or wood as fuel; to provide means for controlling the draft, so that air may be caused to pass upward through the fuel to the outlet during the process of starting the fire and producing a bed of coals sufficient to maintain the fire, and after the bed of coals is established the draft may be downward through the fuel and thence to the outlet; to provide suitable draft-controlling devices, whereby the draft may be increased or diminished at pleasure, and to provide simple and effective means for removing ashes from the heater without removing the fire or otherwise interfering with the operation of the heater.

With these ends in view our invention consists in the novel features of construction and combinations of parts shown in the annexed drawings, to which reference is hereby made, and hereinafter particularly described, and finally recited in the claims.

In the drawings similar reference-numerals designate like parts in the several views.

Figure 1 is a side elevation of the heater. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1. Fig. 3 is a vertical longitudinal section through the heater on the line 3 3 of Fig. 2. Fig. 4 is a horizontal section on the line 4 4 of Fig. 1, and Fig. 5 is an enlarged transverse section through the smoke-flue on the line 5 5 of Fig. 3.

The main structure is preferably of sheet-iron and of the oval form shown, that form being convenient for use in a common form of tanks; but the heater may be of other convenient form without departure from our invention.

The shell 1 is provided with ears 2 to receive bolts or equivalent devices for securing

the heater in the tank in which it is to be used. A lid 3 fits snugly in the shell 1. Bars 4, secured on the shell, support the grate 5. The grate is in two removable sections, as clearly shown in Fig. 4.

Ash-pans 6 occupy the ash-pit under the grate and have bails 7 for use in lifting the pans out of the ash-pit.

The smoke-flue 8 is secured on the lid 3 and extends downward in the fire-box and terminates just above the grate. A hood 9 on the pipe 8 prevents snow and rain from falling into the flue.

The pipe 8 is pierced by an opening 12, communicating with the interior of the fire-box.

A damper 10, mounted on the pipe 8, may be turned by a handle 11. When the damper 10 is turned upward, it closes the opening 12 and shuts off direct communication between the fire-box and the flue 8 and causes an indirect draft downward through the fuel and between the grate-bars to the ash-pit and thence to the smoke-flue 8.

When the damper 10 is turned downward, as indicated by dotted lines in Fig. 3, it lies across the flue 8 and prevents upward draft from the ash-pit through the flue, and the opening 12 being then uncovered there is direct draft from the ash-pit upward between the grate-bars and through the fuel into the fire-box and thence through the opening 12 into the flue 8.

In the drawings the direct draft is indicated by solid-line arrows and the indirect draft by dotted-line arrows.

An air-flue 13, secured on the shell 1, communicates with the ash-pit 20.

A corrugated springy band 17 surrounds and is connected with a pipe 15, which is surmounted by a hood 14.

The corrugated band 17 fits snugly inside of the flue 13, and the pressure of the band on the wall of the flue is sufficient to support the pipe 15 in any position in which it may be placed in the flue and prevent accidental displacement of the pipe, but not sufficient to prevent the intentional turning or sliding of the pipe in the flue, as hereinafter explained.

The pipe 15 has near its upper end openings 16, admitting air to the pipe. It also has near its lower end an elongated opening 18, registrable with a pipe 19, communicating with the fire-box. The slot 18 is elongated in order that it may register with the pipe 19 when the pipe 15 is raised, as shown in Figs.

1 and 3, and may also register with the pipe 19 when the pipe 15 is slid downward in the flue 13, so as to partially or wholly cover the air-inlets 16.

5 By turning the pipe 15 in the flue 13 the wall of the pipe 15 may be caused to partially or completely cover the end of the pipe 19, and thereby control communication between the pipes 15 and 19, so as to increase or check
10 the draft within the fire-box, according to the position of the opening 18 with respect to the pipe 19.

In practical use the heater is placed in the tank and is surrounded by water extending
15 nearly to the top of the shell 1. To start the fire, the lid 3 is removed and kindling and fuel are placed on the grate 5. The pipe 15 is then slid upward to uncover the air-inlets 16 and is turned to close the end of the pipe
20 19. The damper 10 is then turned downward to uncover the opening 12. The kindling is then ignited, and the lid is again placed in position on the shell. Air will then enter through the openings 16 and will pass down-
25 ward through the pipe 15 into the ash-pit 20 and thence upward between the grate-bars and through the fuel into the fire-box, and the smoke and gases from the fire-box will pass through the opening 12 into the flue 8 and
30 thence to the atmosphere, as indicated by arrows X. The parts being thus adjusted, the fire will burn rapidly and will soon produce a bed of coals on the grate. If the draft is too strong, the pipe 15 will be turned to admit
35 air above the fuel, and thereby check the draft.

When a suitable bed of fire has been established and the requisite fuel has been added, the damper 10 will be turned upward to close
40 the opening 12 and the pipe 15 will be turned to bring the opening 18 into registry with the pipe 19. The draft will then be downward through the pipe 15 and through the pipe 19 into the fire-box, thence downward through
45 the fuel and between the grate-bars into the ash-pit, and thence upward through the flue 8 to the atmosphere.

The slow combustion necessary for the most effective and economical use of the
50 heater is attained by sliding the pipe 15 downward to partially close the inlet-openings 16 and turning the pipe 15 to partially close the opening 18. By this means the air-supply may be effectively controlled, so as to
55 produce just the required slow combustion.

When the heater is in use, it is necessary to

remove the ashes from time to time, and it is desirable that this may be quickly and conveniently done without seriously impairing the bed of coals. The construction herein
60 set forth is especially suitable for this purpose.

To remove the ashes from the right-hand end of the heater, it is only necessary to remove the lid and scrape the coals from the
65 right-hand section of the grate over onto the left-hand section, then lift off the right-hand section by means of a hook or other suitable instrument, then with the same instrument
70 take hold of the bail 7 and lift out the underlying ash-pan 6 and empty same and then restore the ash-pan and the grate-section to their original positions, and in like manner the ashes may be removed from the left-hand
75 ash-pan.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A heater comprising a shell, a grate supported on said shell, a lid fitting on said shell,
80 a smoke-flue extending from said grate upward through said lid and having an opening communicating with the interior of said shell above the grate, a damper on said smoke-flue, an air-flue communicating with the in-
85 terior of said shell both above and below said grate and an air-intake pipe within said air-flue having inlet-openings, and an outlet-opening registrable with the pipe communi-
90 cating between the air-flue and the interior of the shell, said air-intake pipe being slidable and turnable within said air-flue to control the air-supply to the inlet and the outlet
openings.

2. In a heater the combination of an air-
95 intake pipe having inlet-openings and an outlet-opening, a corrugated springy band connected with said air-intake pipe, an air-flue within which said air-intake pipe and con-
100 nected band slide and turn, a fire-box in communication with said air-flue and air-intake pipe and a smoke-flue in communication with said fire-box.

In witness whereof we have hereunto subscribed our names, at Mount Pulaski, Illinois,
105 this 1st day of August, 1905.

ELMER E. EDWARDS.
ELMER TURLEY.

Witnesses:

JOHN WEAKLY,
JOHN BENDER.