

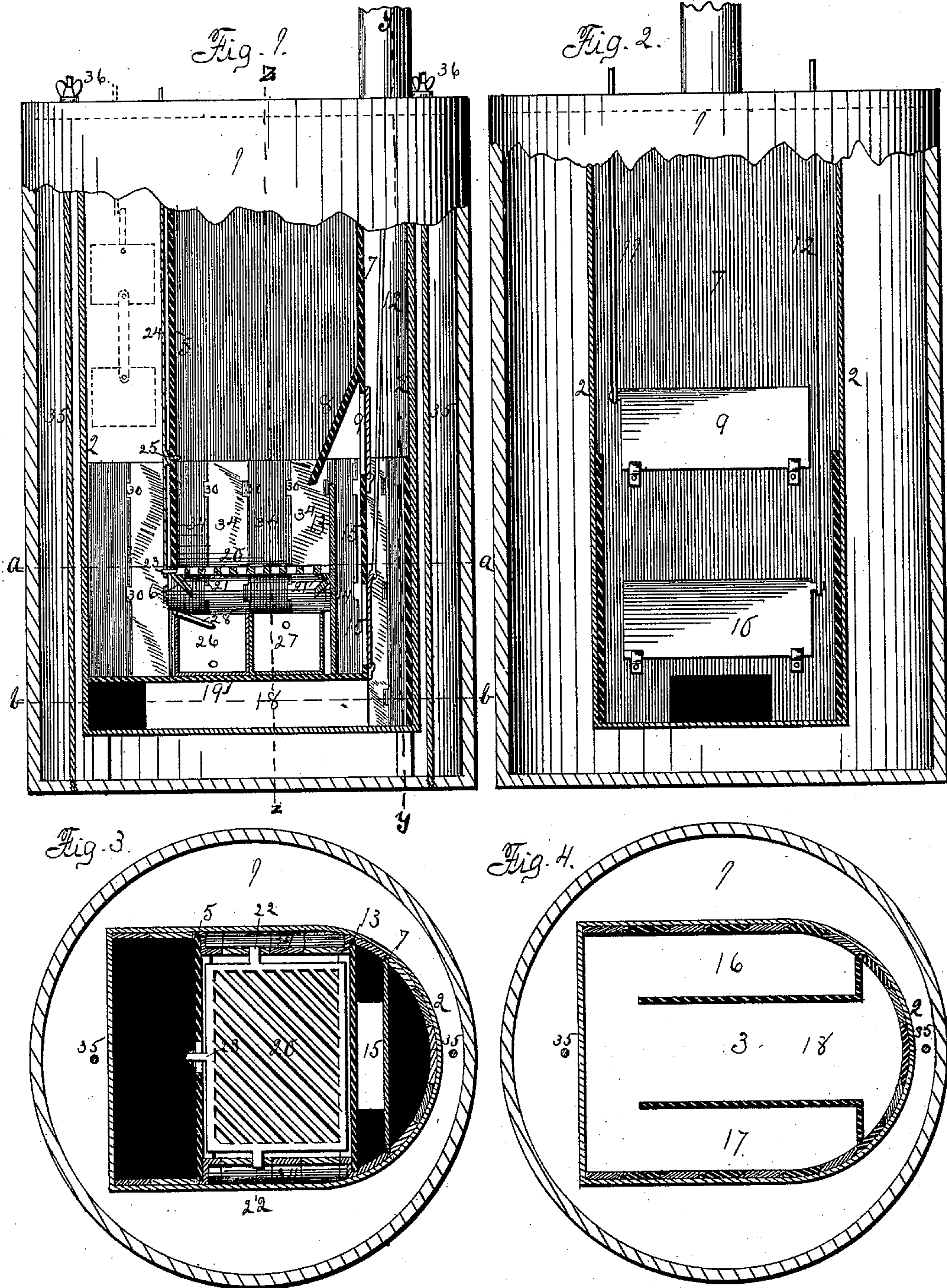
(No Model.)

3 Sheets—Sheet 1.

I. SHOUDY, Jr. & L. L. MILLER.  
AGRICULTURAL BOILER.

No. 434,209.

Patented Aug. 12, 1890.



Witnesses:  
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E. Behel.

Inventors:  
Israel Shoudy Jr.  
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Attys.



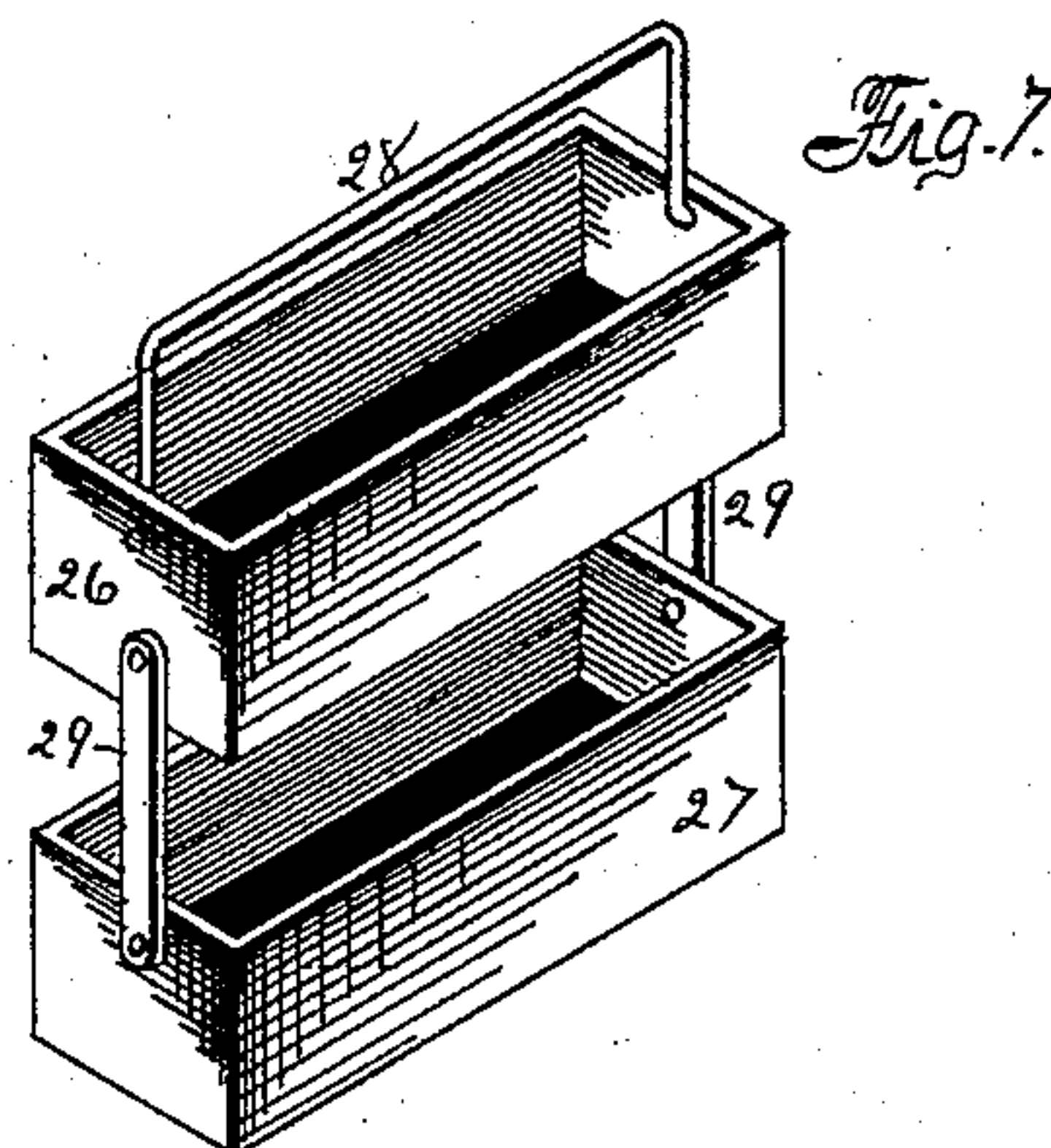
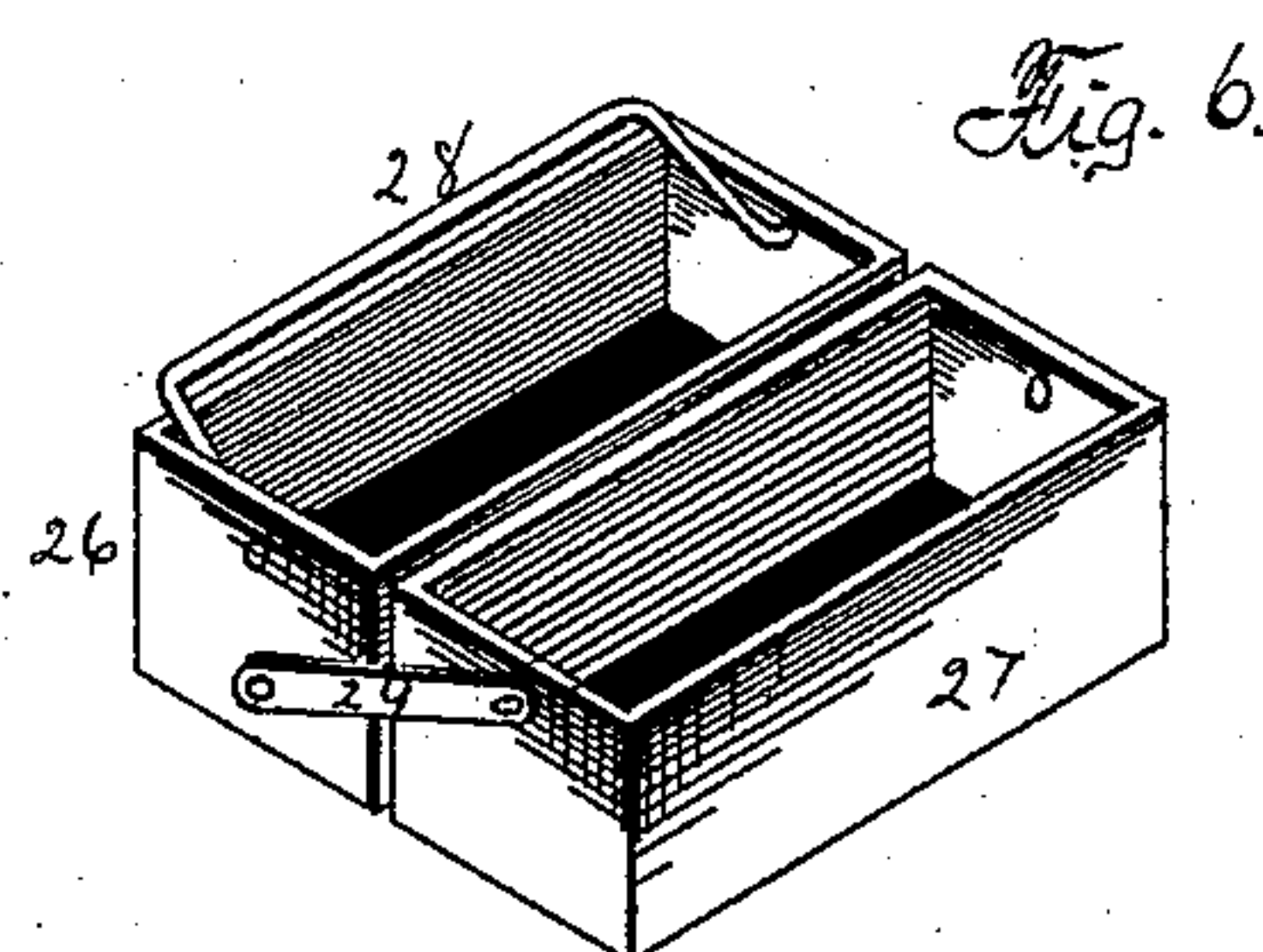
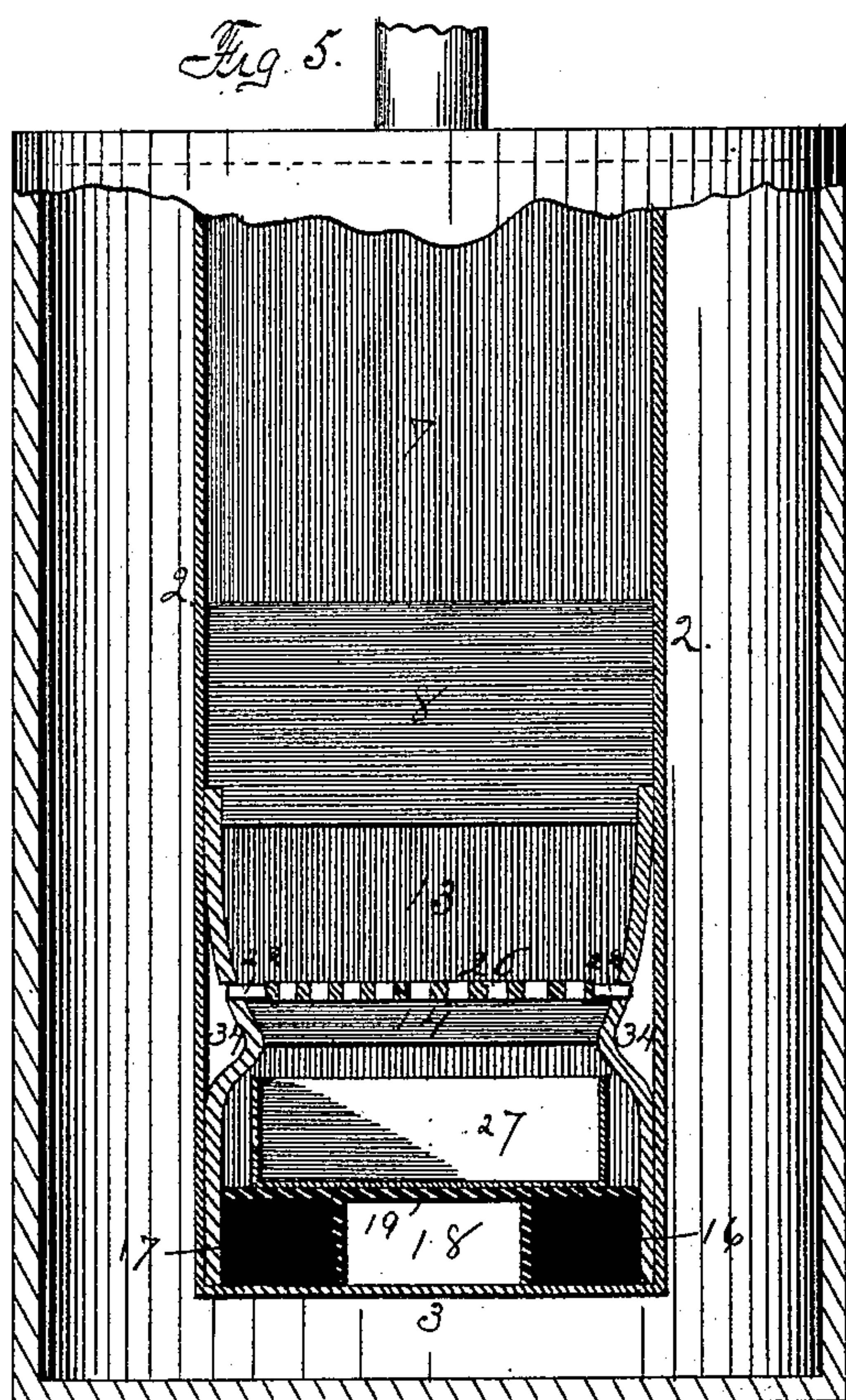
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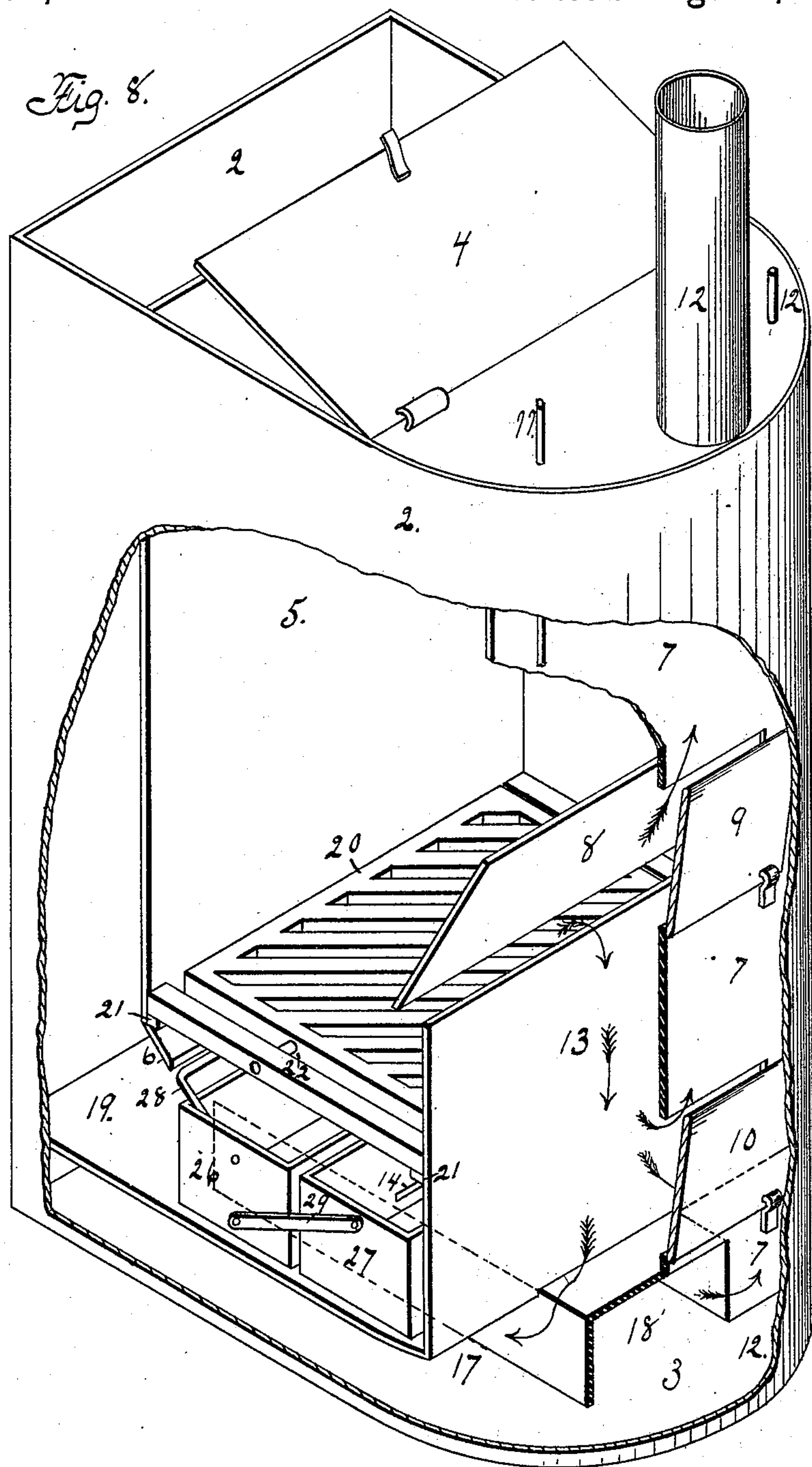
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AGRICULTURAL BOILER.

No. 434,209.

Patented Aug. 12, 1890.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

ISRAEL SHOUDY, JR., AND LUTHER L. MILLER, OF ROCKFORD, ILLINOIS.

## AGRICULTURAL BOILER.

SPECIFICATION forming part of Letters Patent No. 434,209, dated August 12, 1890.

Application filed August 23, 1888. Serial No. 283,567. (No model.)

*To all whom it may concern:*

Be it known that we, ISRAEL SHOUDY, Jr., and LUTHER L. MILLER, citizens of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Agricultural Boilers, of which the following is a specification.

The invention relates to a class of boilers used for heating water or food for livestock; and it consists of a furnace having a fire-chamber, an air and smoke flues connected by a base and return flues, and an ash-pan of a construction adapted to descend the air-flue to its position under the fire-grate, all of which will be hereinafter more fully described, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical central section showing the inner construction of the furnace. Fig. 2 is a vertical section taken on line *y y*, Fig. 1. Fig. 3 is a transverse section on dotted line *a*, Fig. 1. Fig. 4 is a transverse section on dotted line *b*, Fig. 2. Fig. 5 is a vertical central section taken on line *z z*, Fig. 1. Fig. 6 is an isometrical representation of the ash-pan closed. Fig. 7 is an isometrical representation of the ash-pan opened as drawn from the furnace. Fig. 8 is an isometrical representation, partly in section, showing the cover and the arrangement of the flues.

A receptacle 1 to contain the substance to be heated may be of any suitable size and conformation. A furnace is supported in this receptacle, and consists of the outer wall 2, bottom 3, cover 4, hinged to the upper end of the furnace. A partition 5 extends from the upper end of the furnace to the underside of the fire-grate, said partition forming the air-induction flue. The lower end 6 of the partition 5 is inclined toward the center of the furnace, serving to direct the ashes into the ash-pan.

A vertical partition 7 extends the entire length of the furnace, forming the smoke-flue. An inclined portion 8 projects from the partition 7 and forms the inclined side of the fuel-reservoir. Dampers 9 and 10 are hinged to the outer side of the partition 7, and are connected by rods 11 and 12, respectively, which extend through the top of the furnace

and are operated thereby to open or close the opening in the partition.

A partition 13 extends upward from the base of the ash-pit. An incline 14 serves to direct the ashes into the ash-pan. The space between said partition and partition 7 forms a diving-flue 15. This diving-flue connects with two base-flues 16 and 17 running in the lengthwise direction of the furnace and connect with a central return-flue 18, which communicates with the smoke-flue. The horizontal partition 19 separates the base-flues from the ash-pit.

A grate 20, of any suitable construction, is supported upon ledges 21, and is provided with guides 22, which pass through the lining of the lower portion of the furnace. A projection 23 passes through the partition 5, upon the free end of which is connected a shaker-rod 24. The shaker-rod is pivoted at 25 to the partition 5 and extends upward beyond the upper end of the furnace. By this construction of a grate and shaker-rod an oscillatory movement of the rod upon its pivot will cause the grate to reciprocate in a horizontal plane. The guides 22 will guide it in its movement.

An ash-pan for use in connection with agricultural boilers in this instance is composed of two sections 26 and 27 of proper size. Section 26 is provided with a bail 28, pivoted thereto, by means of which the sections may be carried. These sections are connected together by links 29, pivoted to the lower edge of section 26 and upper edge of section 27, as clearly shown in Figs. 6 and 7.

In placing the ash-pan in position in the furnace the sections are lowered through the air-induction flue, as shown in dotted lines, Fig. 1. When the lower section reaches the bottom of the ash-pit, it is moved under the fire-grate by a suitable rod sufficiently to break the vertical position of the links 29, connecting the sections. The section 27 will continue to move under the fire-grate as the section 26 descends, when they will occupy the position shown in Fig. 1.

In removing the pans from the furnace a rod is lowered to lift the bail of section 26 and draw it up out through the air-flue, and by reason of the linked connection of the



section section 17 will follow. The object in making the ash-pan in sections is that a much smaller air-flue can be used than if made in one large section.

5 The lining employed in our furnace consists of sections, as shown at Fig. 1. These sections are provided with extending lips 30 to overlap the adjacent section. This lining extends from the bottom of the furnace upward above the fire-chamber and will protect the outside casing. A number of the sections are curved, as shown at 34, Fig. 5, and forms an incline, under which the ash-pan is placed, and causes the ashes to enter the ash-pan.

15 Rods 35 are screwed into the bottom of the receptacle 1 and extend upward along the furnace and pass through the upper plate thereof. The upper ends of the rods are screw-threaded and receive thumb-nuts 36, which are screwed down and hold the furnace in position in the receptacle.

In a furnace constructed as above described fire is started by placing fuel in the fire-chamber. The damper 9 is open, which will cause a direct draft to pass through the fire-grate. When the fire is well under way, the damper 9 may be closed and the damper 10 opened, which will cause the current of hot air to descend the diving-flue to or nearly to the bottom of the furnace, thereby connecting the fire-chamber with the smoke-flue.

The fuel-reservoir may be filled with fuel and the damper 10 closed, which will direct the draft through the base-flues 16 and 17 and pass through the return-flue 18 to the smoke-flue, thereby utilizing the hot current of air to heat the base and sides of the furnace.

By employing an ash-pan in the manner above described we avoid removing the grate from the furnace or the furnace from the receptacle, in order to remove the ashes as is necessary in furnaces now in use.

We claim as our invention—

45 1. In combination, a receptacle to contain the substance to be heated, a fire-chamber, a fire-grate, air-inlet and smoke-outlet flues, and

a shaker-rod pivoted intermediate its ends, one end of the rod being attached to the grate and the other end projecting through upper portion of the casing, whereby the grate may be reciprocated while the fire-chamber is immersed in the substance within the receptacle, substantially as set forth.

2. An agricultural boiler composed of a receptacle to contain the substance to be heated, a fire-chamber, a fire-grate, an air-flue, a smoke-flue, and an ash-pan, and means for placing it in position beneath the fire-grate by causing it to descend a suitable vertical flue from above without removing the grate, said pan being removable independently of the grate, substantially as set forth.

3. An agricultural boiler composed of a fire-chamber, a grate, an air-flue, a smoke-flue, and an ash-pan in sections, the said sections when arranged side by side being of greater dimensions than the flue through which they are inserted, substantially as set forth.

4. An agricultural boiler composed of a fire-chamber, a fire-grate, an air-flue, a smoke-flue, and an ash-pan made in sections linked, the said sections when arranged side by side being of greater dimension than the flue through which it is inserted beneath the grate, substantially as set forth.

5. The combination, with an agricultural boiler having a fire-grate and flue extending from above down to and beneath the grate, of an ash-pan formed in sections loosely connected to one another and to a lifting-rod, the said sections when arranged side by side being of greater dimension than the flue through which they are inserted and each of less dimension than said flue when arranged one above the other, whereby they may be withdrawn from beneath the grate through the flue and assume upright positions, substantially as set forth.

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