

No. 640,663.

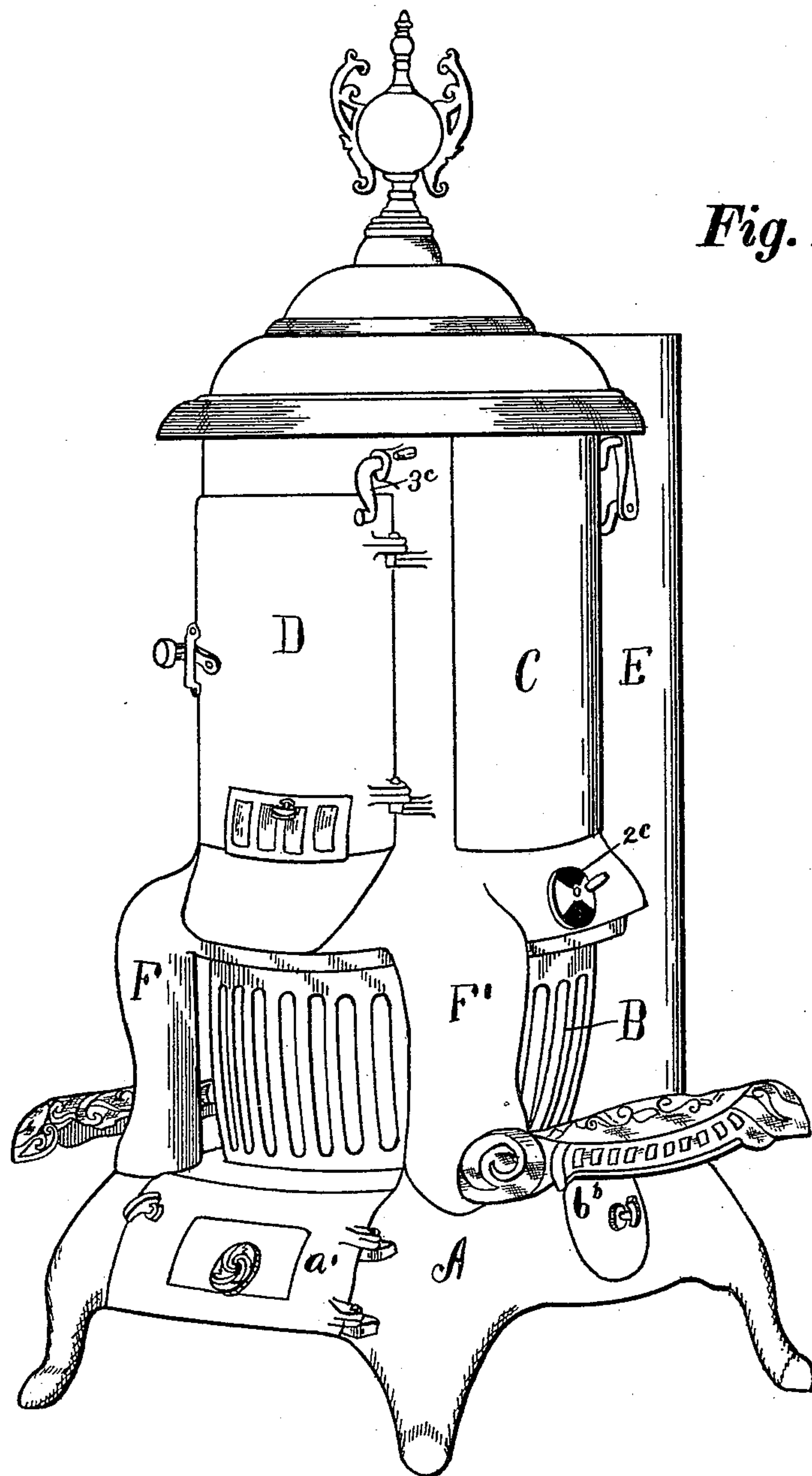
Patented Jan. 2, 1900.

W. J. KEEP & W. V. ROBINSON.
HEATING STOVE.

(Application filed Aug. 13, 1897.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES
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V. M. Clough.

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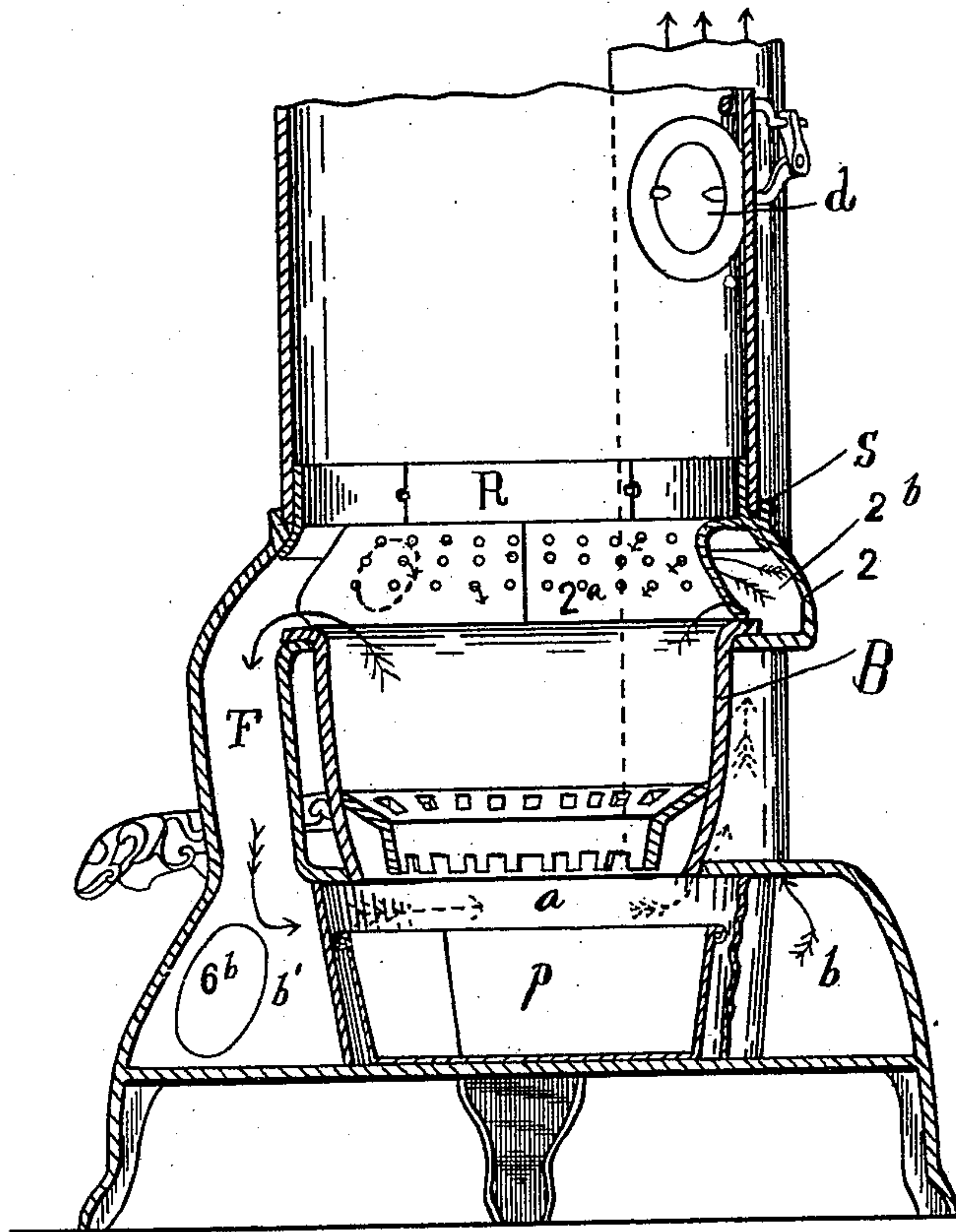


Fig. 2

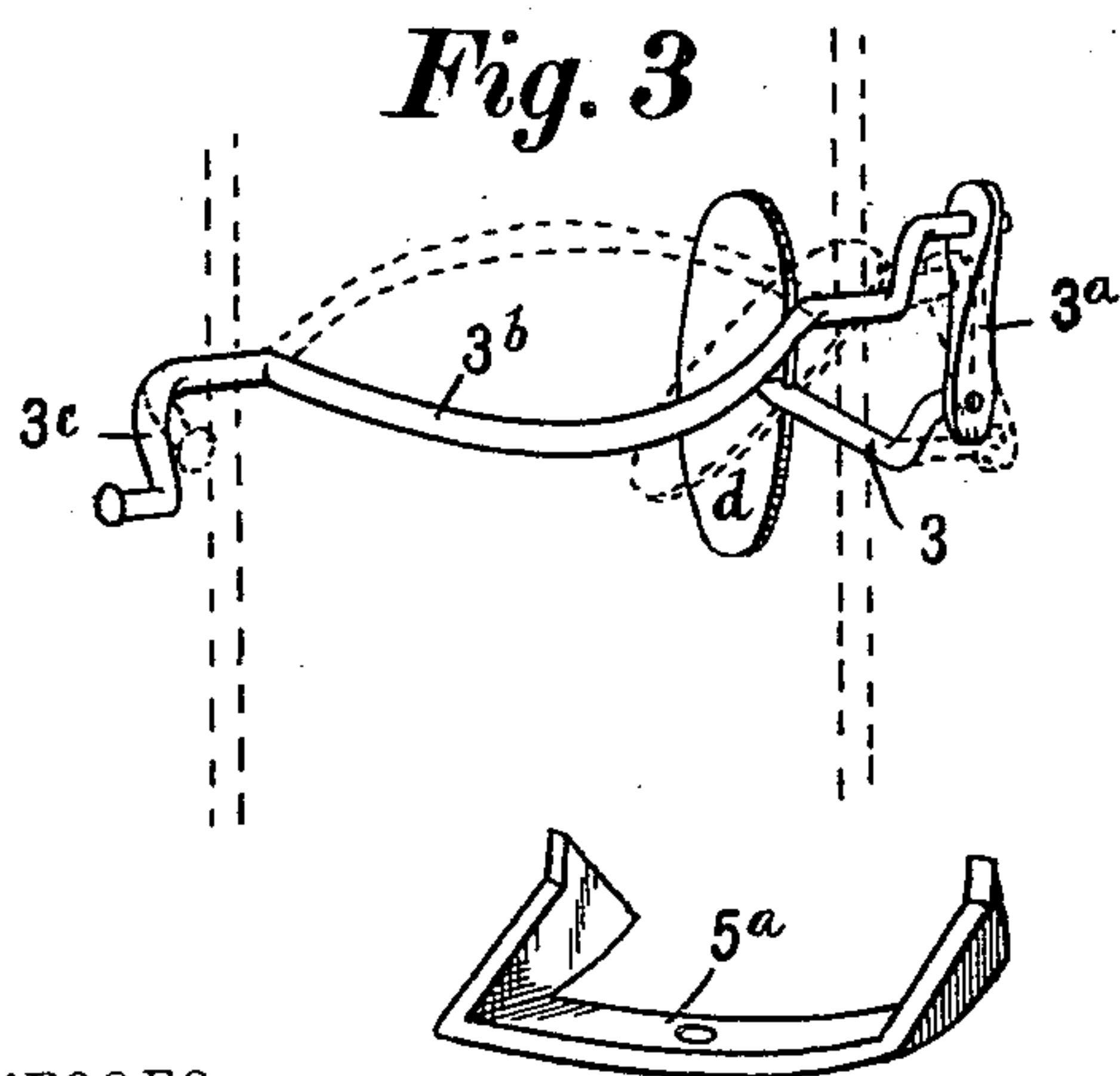


Fig. 3

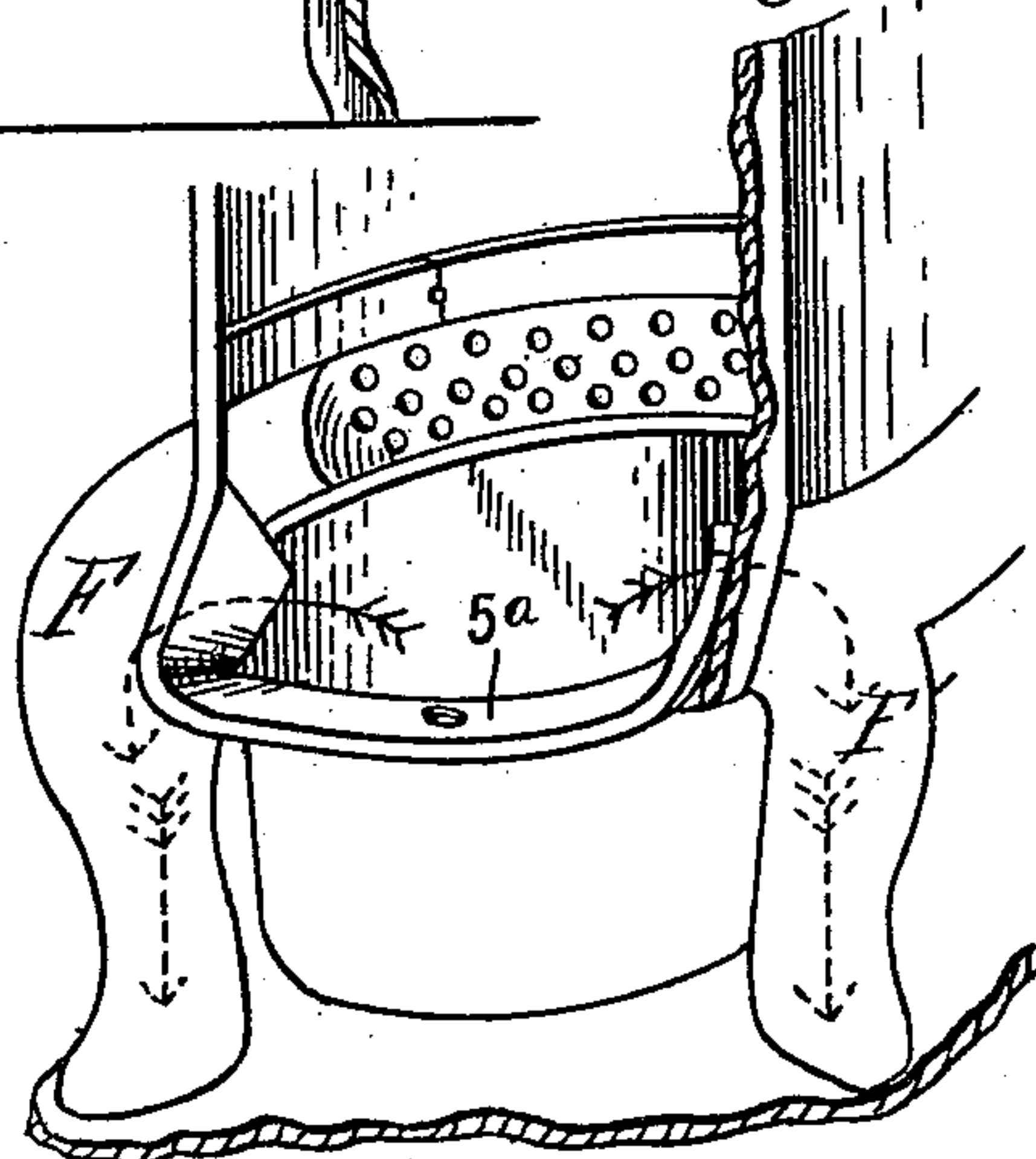


Fig. 4

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Fig. 5

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UNITED STATES PATENT OFFICE.

WILLIAM J. KEEP AND WILLIAM V. ROBINSON, OF DETROIT, MICHIGAN,
ASSIGNORS TO THE MICHIGAN STOVE COMPANY, OF SAME PLACE.

HEATING-STOVE.

SPECIFICATION forming part of Letters Patent No. 640,663, dated January 2, 1900.

Application filed August 13, 1897. Serial No. 648,093. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM J. KEEP and WILLIAM V. ROBINSON, citizens of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Heating-Stoves; and we declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to stoves, and has for its object improvements in that class of stoves which are especially adapted to be used for burning soft coal, in which the combustion-chamber or fire-pot in which the coal is held during the progress of combustion is externally exposed. In stoves of this character there is usually a combustion-section or fire-pot section located immediately above the ash-pit, and above this is a section inclosed by sheet-iron, out of which opening leads the smoke-pipe. In such stoves by fitting all the joints very tight and cementing them, so that the stove when closed is practically air-tight, the fire can be controlled reasonably well, and as every part of the stove above the base has its inside surface exposed to the fire and the outside surface exposed to the room to be heated the heat generated by the fire is transferred to the air in the room directly, and as the tendency of heated air is to rise the radiation from the stove into the room takes place principally from that part of the stove which is above the fire-pot, and the lower part of the room is not heated as much as is desirable.

Many efforts have been made to construct a stove made as above described with a flue leading to the base, so as to produce a base-heating stove; but in the attempts that have been made portions of the direct-heating surface of the stove have been so covered in by the diving-flue that the gain was small, and also when the flue was placed against parts that were exposed on the other side to the direct action of the fire such parts were soon burned through, especially those parts which were in direct contact with the coal. In the stove

embodying our invention we have combined with the base and flue leading from above the fire-pot, so arranged that all surfaces are left uncovered or exposed the same as when no flue is used, and the stove combines, in addition to the heating-surface heretofore used, additional heating-surface equal in extent to the external surface of the flue, and the base around the ash-pit is also used as heating-surface, which not only increases the surface of radiation, but places it lower on the stove than has heretofore been possible with the class of stoves referred to. There are several other incidental features of improvement in the stove which will be described and claimed.

In the drawings, Figure 1 shows the stove in perspective. Fig. 2 is a diagonal vertical section through the stove. The upper part of the stove above the smoke-exit is not shown in this figure. Fig. 3 is a detail of the damper-actuating device. Fig. 4 is a perspective of the fire-pot and its immediate connection. Fig. 5 is a detail of the guard used at the front top edge of the fire-pot to prevent cold air from blowing down the flues when the door of the stove is opened.

A indicates the base, B the fire-pot section, and C the section above the fire-pot section, into which opens the feed-door D.

E indicates the smoke-pipe, and F F' the return or diving flues.

The base A is made with a central chamber *a*, closed in front by a door *a'* and separated from the chamber *b*, which lies at each side and at the rear of the central chamber A, by a partition-wall *b'*. The central chamber *a* is intended as the ash-pit, and within it is received the ash-pan *p*.

The fire-pot B is substantially round in horizontal cross-section in accordance with the form of fire-pots of this class of stoves.

Immediately surrounding the upper edge of the fire-pot is a chamber 2, that extends in the form of a broken or partial ring that extends around the back of the stove and on each side of it to near the opening for the feed-door. The ends of this chamber are closed. Its inner wall is perforated with numerous air-inlet holes of small size. Its outer walls are perforated with two damper-closed open-

ings, one opening lying at each side of the stove. The ring is made without horizontal joints, but in two or more pieces with vertical joints 2^a.

5 At the front between the ends of the curved chamber just described, between the end of the chamber and the door-opening, is an opening leading into diving-flues F F'. Each of the diving-flues F F' consists of a pipe lead-
10 ing downward to and into the chamber b. The pipe of the flue F or F' sets out from the body of the stove, so as to be entirely separated therefrom, except at the points where it leads out from the chamber above the fire-
15 pot and into the chamber around the ash-pit.

The smoke-exit pipe leads from the chamber b at the rear of the stove and leads up parallel with the axis of the stove, having a direct-draft inlet near the top of the stove,
20 which is normally closed by a damper d. This damper is arranged to be actuated by a series of crank-levers (indicated in Fig. 3) so arranged that the opening of the door D opens the damper d. In order that this result may
25 be brought about, the damper d is hung on pins on its horizontal axis. One of the pins 3 is bent in crank form and engages with a link 3^a. The other end of the link engages with the cranked terminal of a rock-shaft 3^b,
30 the front end of which projects through the stove and terminates with a crank-arm that engages over the door D just forward of its hinge-line. The body of the rock-shaft 3^b is bent so that it follows the side of the stove
35 in its course from the front to the rear of the stove. The opening of the stove actuates the damper d and throws it open, so that there is direct entrance into the smoke-exit pipe when the door is open, and the damper falls
40 by gravity when the door is closed, so that the products of combustion are compelled to pass downward to the base of the stove on their way to the smoke-exit pipe when the door is closed. If it be desired to have direct
45 draft—as, for instance, when the fire is new—the rock-arm 3^c is turned a half-revolution, and the damper will be thrown open and remain open.

50 At the front of the fire-pot, below the door D, is a guard-apron 5^a, the ends of which project inward and partially cover the front and upper side of the opening into the down-

draft flues, and thereby prevent coal falling into or a rush of cold air into those flues when the door is opened. The chamber 2^b, 55 which partially surrounds the stove above the fire-pot, is for the purpose of directing and dispersing what may be termed a "secondary inlet of air," that enters through the damper-closed openings 2^c. The air enters 60 through this opening into the chamber 2^b, and instead of passing directly on to the top of the fire from the openings 2^c it is dispersed or scattered around about three-fourths of the stove, is practically heated, and finally 65 mingles with the unconsumed gases above the fire-pot, to which it is admitted through the numerous small holes in the interior of the chamber.

The chamber C is walled with sheet-iron, 70 and in order that the joint between the sheet-iron and the cast-iron-walled chamber 2 may be sufficiently tight and firm we use above the chamber 2 a cast-iron ring R made in two or more pieces that project above the 75 seat s on top of the chamber 2 for a distance, so that the sheet-iron wall of the chamber C may fit down over the cast-iron ring into the seat s.

All the joints are made with cups, into 80 which the ends of the joining pieces set, so that the joints all remain tight or approximately tight even if there be considerable inequality of expansion in the adjoining pieces.

6^b indicates clean-out doors that lead 85 through the outer walls of the base and permit easy access into the base at the bottom of the flues F F'.

What we claim is—

In a stove of the character described in 90 combination with the fire-pot, the chamber above the fire-pot provided with a feed-door opening, and its door, the diving-flues F, F' and a guard 5^a located below the door, and partially covering the openings into the down- 95 draft-flues, substantially as described.

In testimony whereof we sign this specification in the presence of two witnesses.

WILLIAM J. KEEP.

WILLIAM V. ROBINSON.

Witnesses:

ISAAC S. FILER,

J. EDWIN ELLIS.