No. 837,814. PATENTED DEC. 4, 1906.

A. V. ERVING.

STOVE.

APPLICATION FILED OCT. 27, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

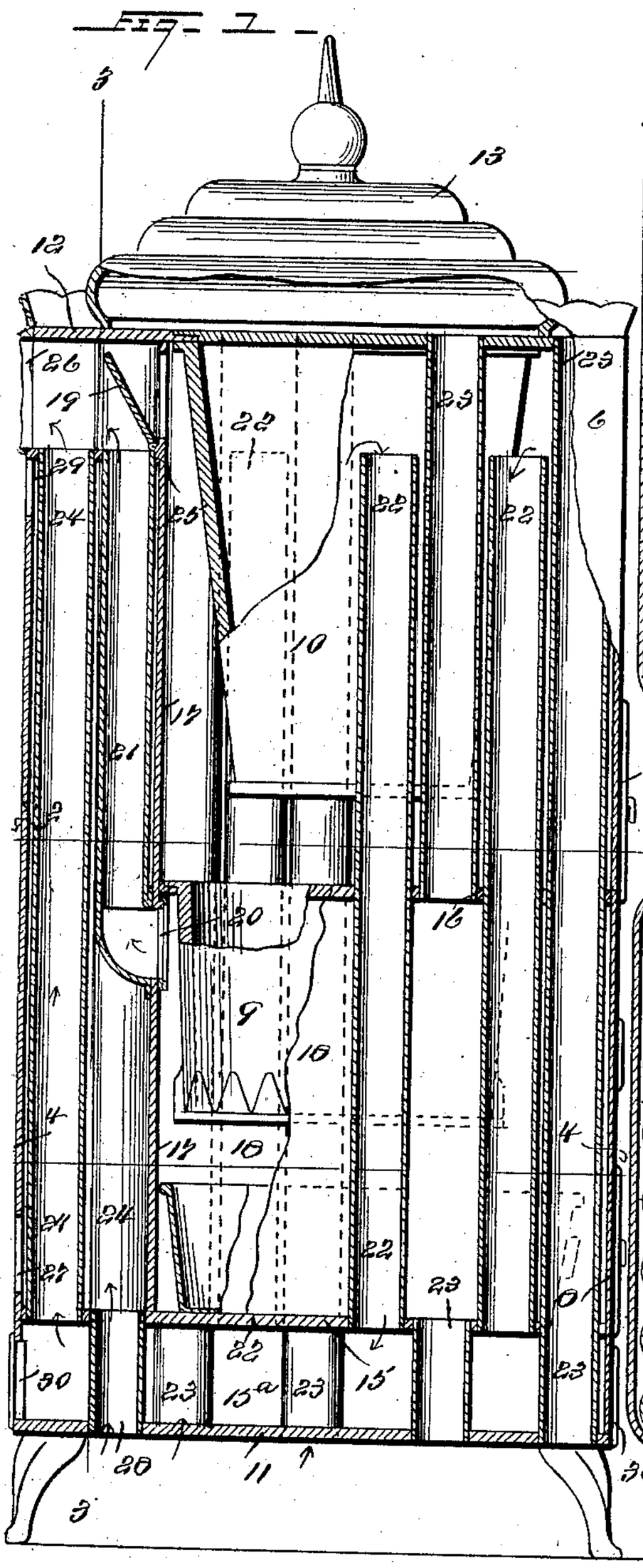

Fig. 2.

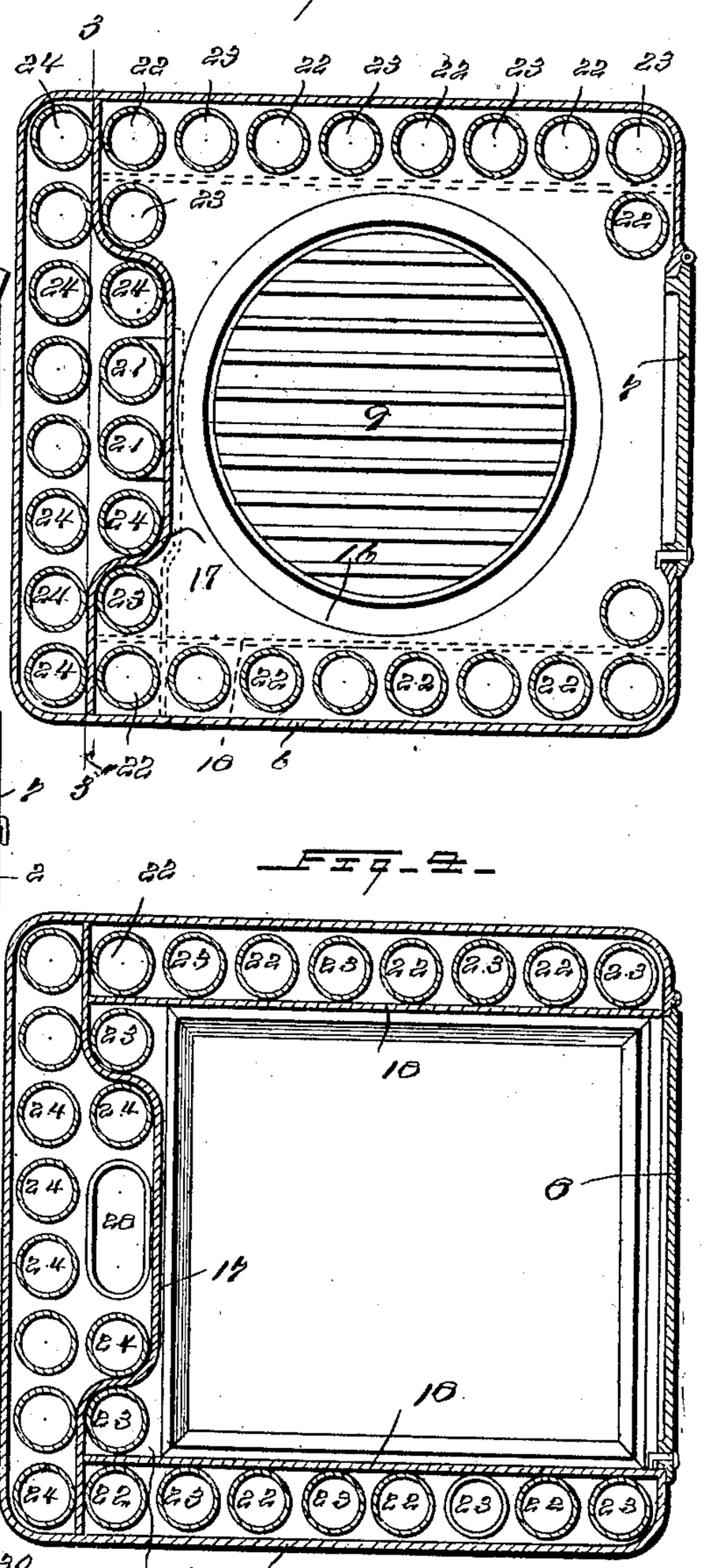

Fig. 3.

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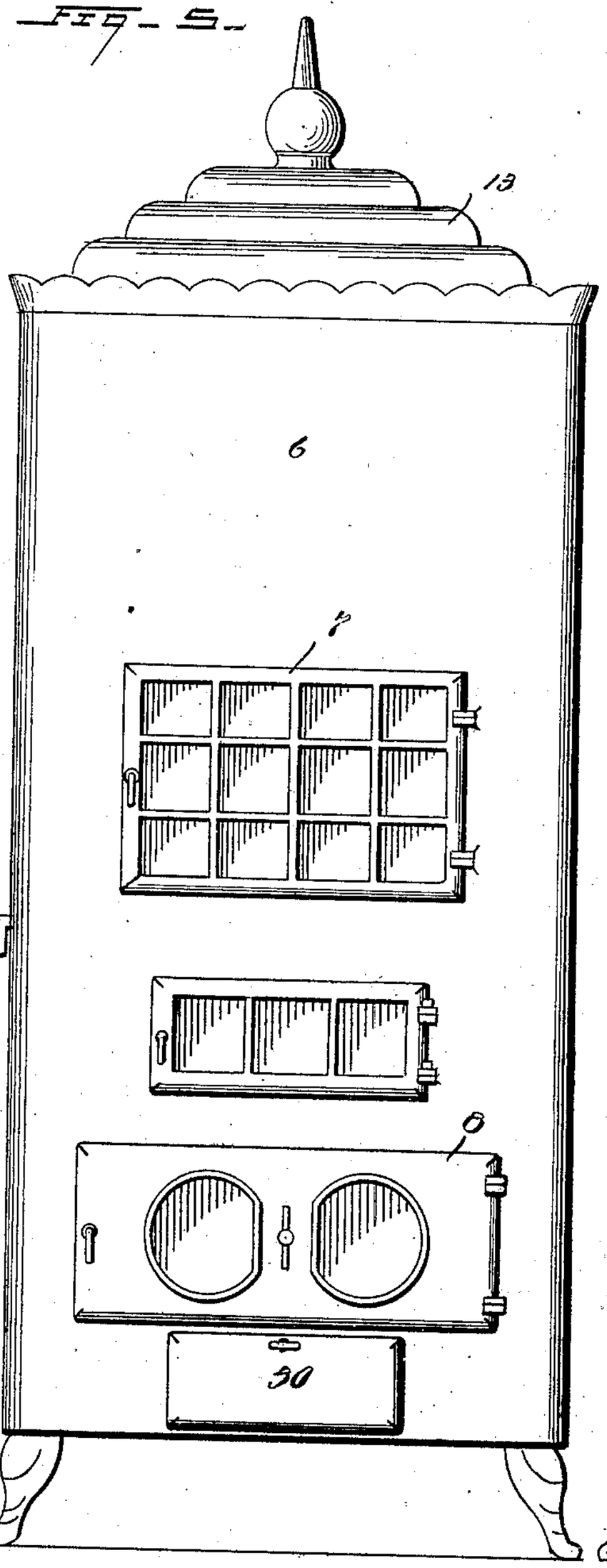
2 SHEETS—SHEET 2.

Fig. 5.



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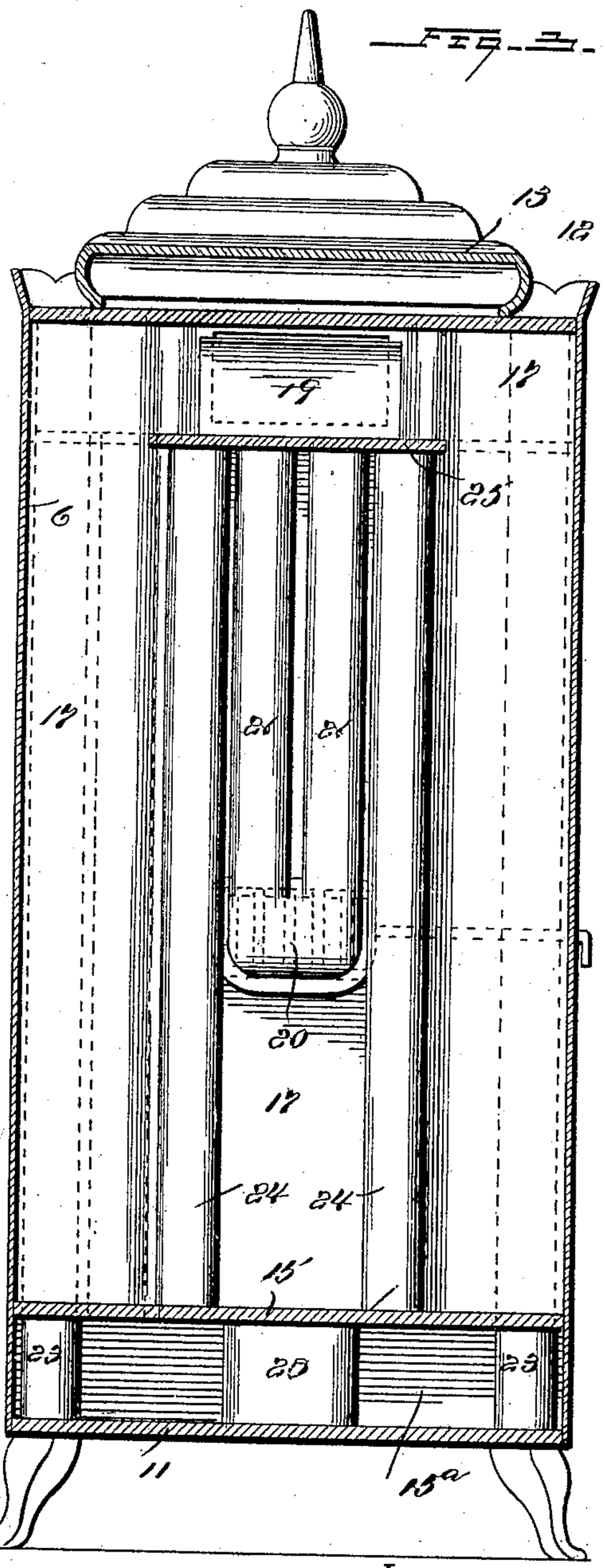

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STOVE.

No. 837,814. Specification of Letters Patent. Patented Dec. 4, 1906.

Application filed October 27, 1905. Serial No. 284,652.

To all whom it may concern:

Be it known that I, ANDREW V. ERVING, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Stoves, of which the following is a specification.

This invention is a heating stove or furnace, and has for its object to provide a stove which will utilize to a large extent the heat generated by the combustion of the fuel. To this end the stove is provided with a considerable number of cold-air tubes which pass through the body or combustion-chamber of the stove in such a manner that the products of combustion flow around or beside said tubes and heat the air which passes therethrough. Means are provided to conduct the hot smoke and gases from the fire-pot down to the base of the stove and thence up through suitable tubes to the smoke-pipe.

The stove and flues may be round, square, or any other suitable shape; but for the purpose of illustration a square or rectangular stove is shown and described. A noticeable feature is the small number of small castings or small parts required to form the body and support the shell of the stove and the tubes therein.

In the accompanyng drawings, Figure 1 is a side elevation, part of the outer shell being broken away and parts being shown in section. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a section on the line 3 3 of Figs. 1 and 2. Fig. 4 is a section on the line 4 4 of Fig. 1. Fig. 5 is a front elevation.

Referring specifically to the drawings, 6 indicates the outer casing or shell of the stove. This may conveniently be made of sheet iron, and it is provided with the usual door 7 and draft devices and a door 8 into the ash-pit. The fire-pot is indicated at 9 and the magazine-hopper at 10, above the same.

In the construction of the stove four principal horizontal plates are used. The bottom plate is indicated at 11, to which the legs are attached, and the top plate at 12, having the usual opening at the top of the magazine, closed by a cover 13.

15 indicates a plate which extends across the stove several inches above the bottom plate 11 and forms a bottom for the ash-pit and also produces a hot-air space or flue 15^a in the base of the stove. At or about the middle of the stove is another transverse plate 16, which has a large central opening in which the fire-pot 9 is supported. An inner casing is formed by a sheet-metal partition 17, behind the fire-pot, and a sheet-metal partition 18, extending around the fire-pot and ash-pit. The partition 17 extends across between the sides of the outer casing and from the top plate 12 down to the plate 15, dividing the casing into front and rear parts, the former of which contains the fire-pot, ash-pit, magazine, and various flues, to be hereinafter described, and the latter of which contains flues, as will also appear hereinafter. This partition is provided at the top with a damper 19, which controls the direct draft to the smoke-pipe. The partition 18 extends from the plate 16 downwardly to the plate 15 and forms side spaces containing the side flues, as hereinafter described, and incloses the fire-pot, grate, and ash-pit. The back partition 17 is also provided with a check-opening which opens below the plate 16 and is controlled by a damper at 20. This opening leads to two flues 21 to the smoke-pipe, and the fire is checked by opening the slide, which allows the air to draw through the check instead of through the fire.

At 22 are indicated smoke-flues through which a downdraft from the combustion-chamber is effected. These tubes are arranged around the fire-pot, and they open at the top into the space around the magazine below the top plate 12 and extend thence down through the plates 16 and 15 to the base-space 15^a. Between the plates 16 and 15 they pass through the space between the partition 18 and the shell 6. Similarly arranged around the fire-pot and magazine and preferably in alternation with the tubes 22 are a series of air-tubes 23, which extend from the top to the bottom of the stove and through all of the plates and open at the bottom. Preferably one or more of the air-tubes 23 on each side is cut out between plates 16 and 15, so as to provide an air circulation through said space, leaving the short end from plates 15 to 11. Cold air is drawn into these tubes from the space under the stove and is carried up through the same and discharged at the top in heated condition, and thus performs one of the main heating functions of the stove. In the space above the plate 16 these air-tubes are exposed to the direct heat of the fire. Below said plate they pass through spaces which are heated by the

hot smoke and gases flowing through tube 22. Consequently the air which passes through the tube 23 is heated to a high degree and the heat generated by the fire is to a large extent utilized.

The return-flues for the smoke and gases are located behind the partition 17 and are indicated at 24. They extend from the plate 15 to a small plate 25, which covers the space between the partition 17 and the shell and is located below the damper 19 and below the entrance to the smoke-pipe 26. Air circulates through this space, being admitted through a back opening 27 and a short tube 28 at the bottom and discharged through a top opening 29 at the top. Hence the air in the room is heated in both the downward and upward passages of the smoke and gases.

An advantageous feature of the construction is that the chamber 15[a] in the bottom forms a space in which the soot collects and from which it may readily be cleaned out through front and rear doors 30.

What I claim as new, and desire to secure by Letters Patent, is—

1. A stove having a vertical partition across the same, a horizontal partition in front of the vertical partition, forming upper and lower chambers, a fire-pot supported by the horizontal partition, flues extending from the upper chamber through the lower chamber, around the fire-pot, a flue extending from the lower chamber upwardly behind the partition to the smoke-pipe and having a check-valve, air-inlet flues from the bottom of the stove to said lower chamber and air-outlet flues from said lower chamber.

2. A stove comprising an outer casing divided by a vertical partition into front and rear chambers, the former of which contains the fire-pot and the latter of which communicates with the smoke-pipe, a base-chamber connecting said chambers under the partition, a horizontal partition extending across the front chamber and dividing the same into upper and lower parts, a fire-pot supported on said horizontal partition, flue-pipes located around the fire-pot and extending from the upper part of the front chamber downwardly through the lower part thereof into the base-chamber, air-pipes extending through the base-chamber into said lower part of the front chamber, and air-pipes extending from said lower part through the upper part of said chamber and the top of the stove, the vertical partition having direct-draft and check dampers respectively controlling openings from the upper and lower parts of the front chamber into said rear chamber.

3. A stove comprising a shell, top and bottom plates therein, spaced upper and lower intermediate plates extending to the front and sides of the shell, the former forming a support for the fire-pot and the latter forming a base heating-chamber above the bottom plate, air-inlet pipes extending through said chamber into the space between the intermediate plates, a vertical partition extending across between the sides of the shell and from the top plate to the said lower plate, forming front and rear parts the former of which contains the fire-pot and the latter connects with the smoke-pipe, and having openings above and below the fire-pot controlled respectively by a direct-draft damper and check-valve therein, down-flues extending in said front part from above the fire-pot through said intermediate plates to said chamber and up-flues extending in said rear part from the chamber to the smoke-pipe, and air-pipes extending up through the stove from the said space to the top, beside said flues, in front of the partition, and air-passages extending up through the stove from the bottom to the top, behind the partition.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDREW V. ERVING.

Witnesses:
ELIZABETH J. PRICE,
JESSIE A. GORDON.