

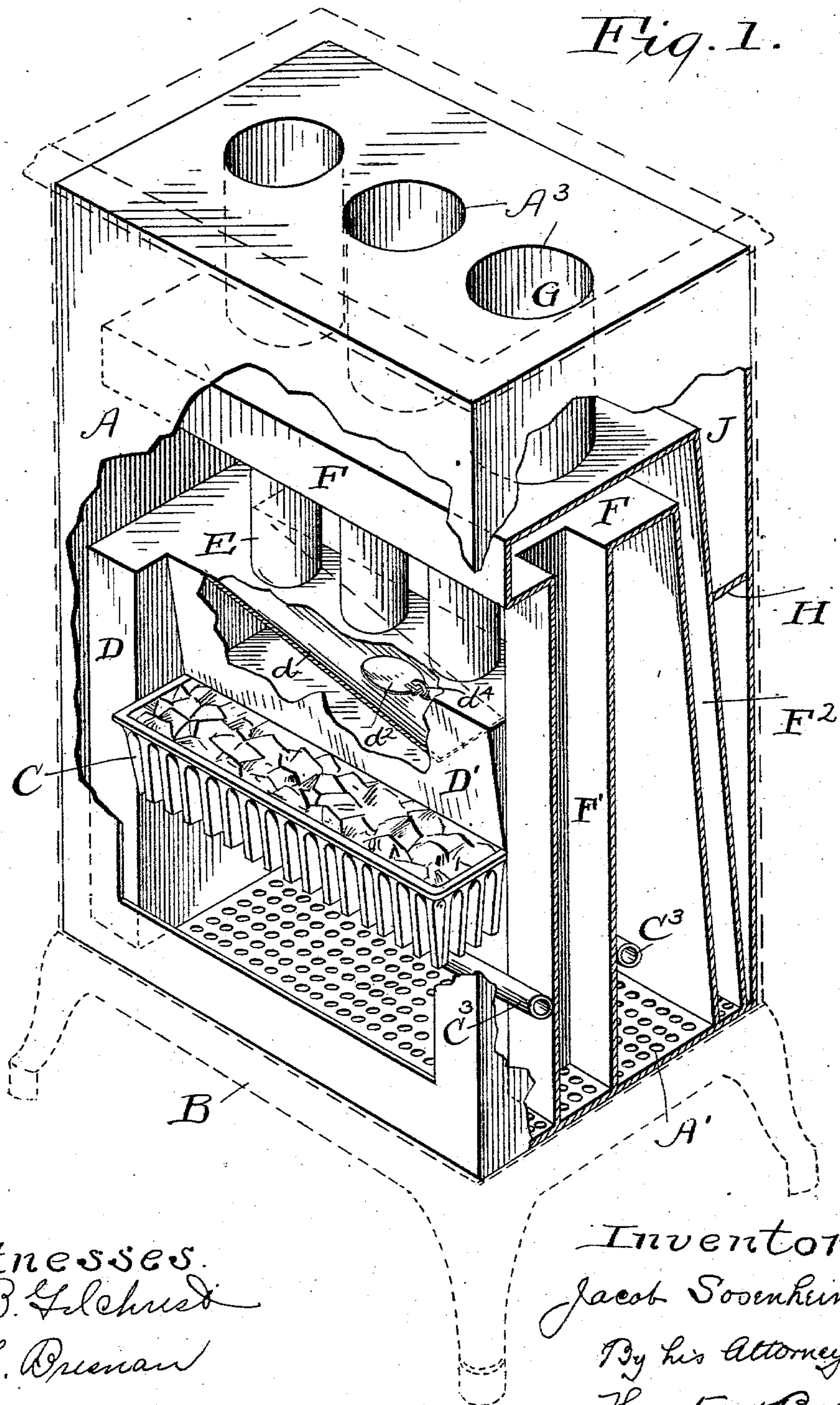
No. 730,578.

PATENTED JUNE 9, 1903.

J. SOSENHEIMER.  
HEATING APPARATUS.  
APPLICATION FILED FEB. 4, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses.  
E. B. Gilchrist  
N. L. Brennan

Inventor.  
Jacob Sosenheimer,  
By his Attorneys,  
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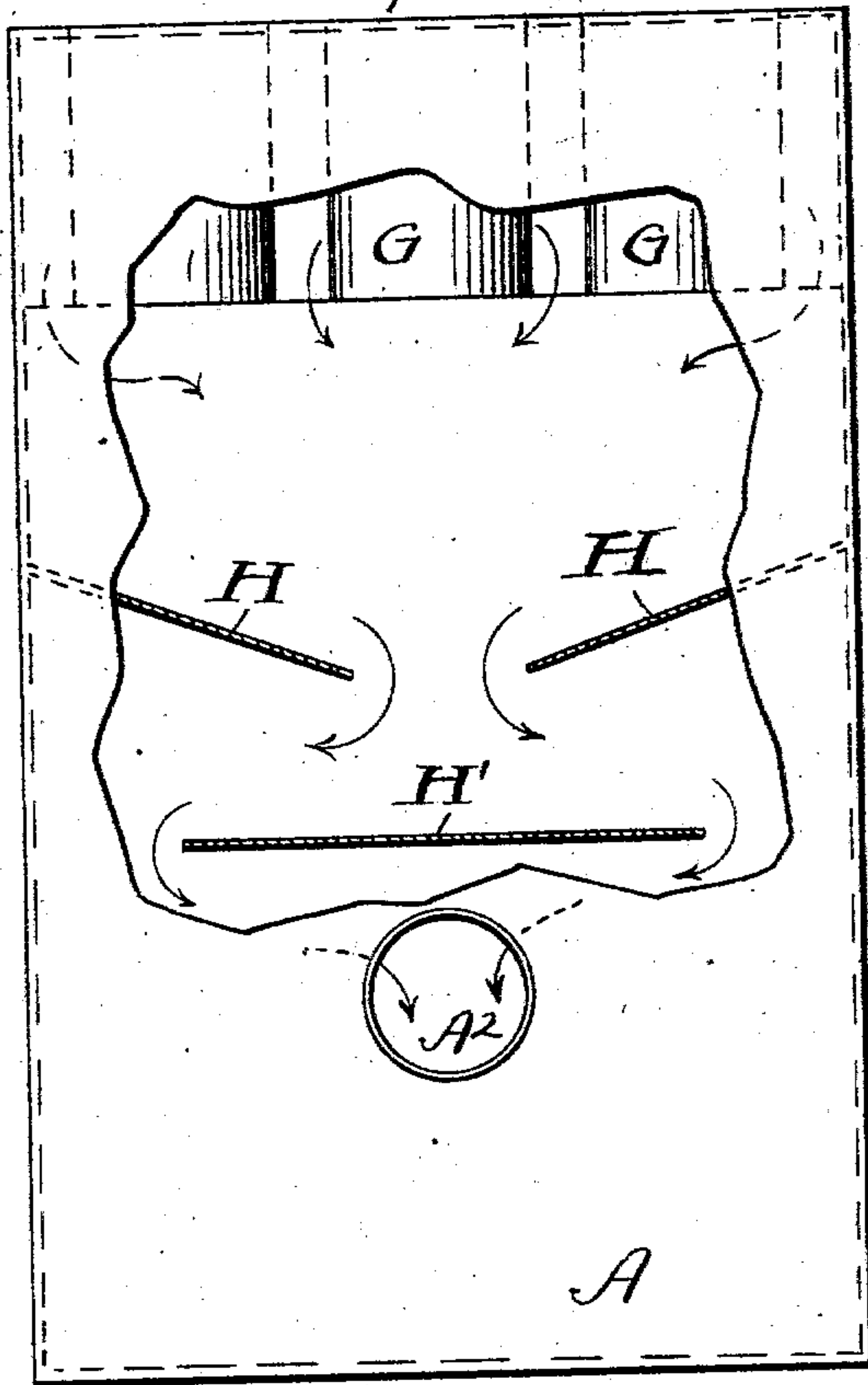
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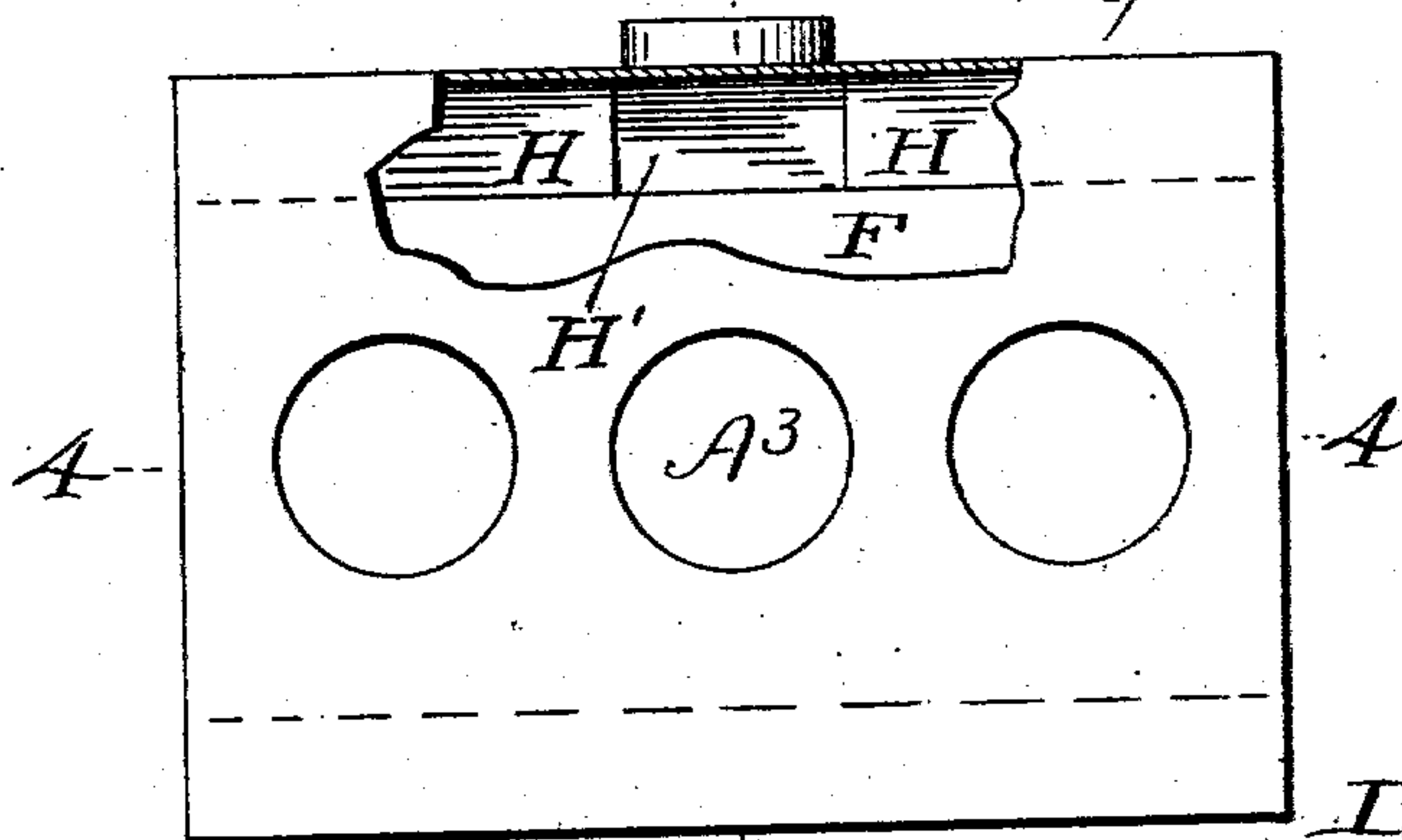
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3 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 3.*



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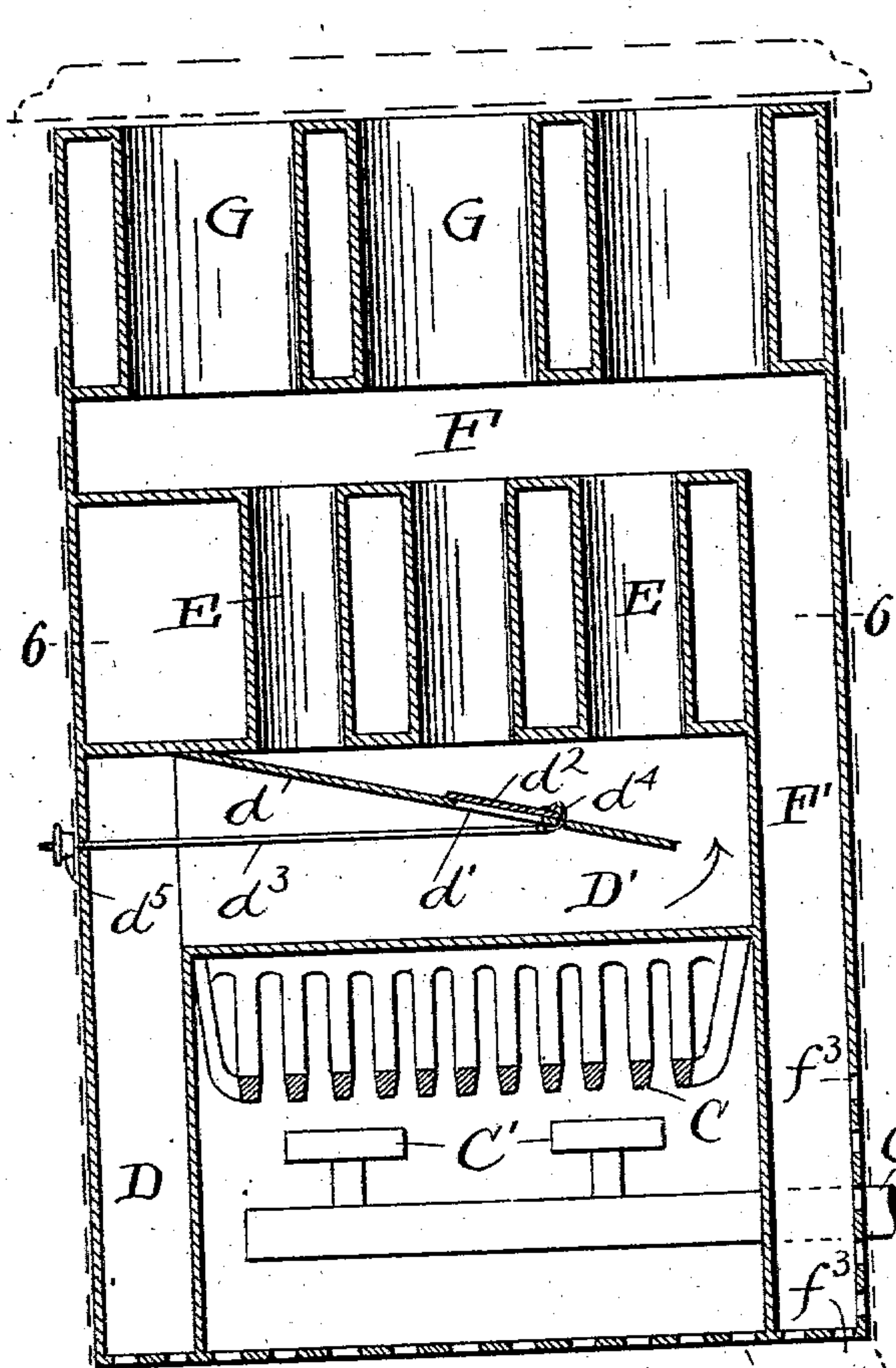


Fig. 4.

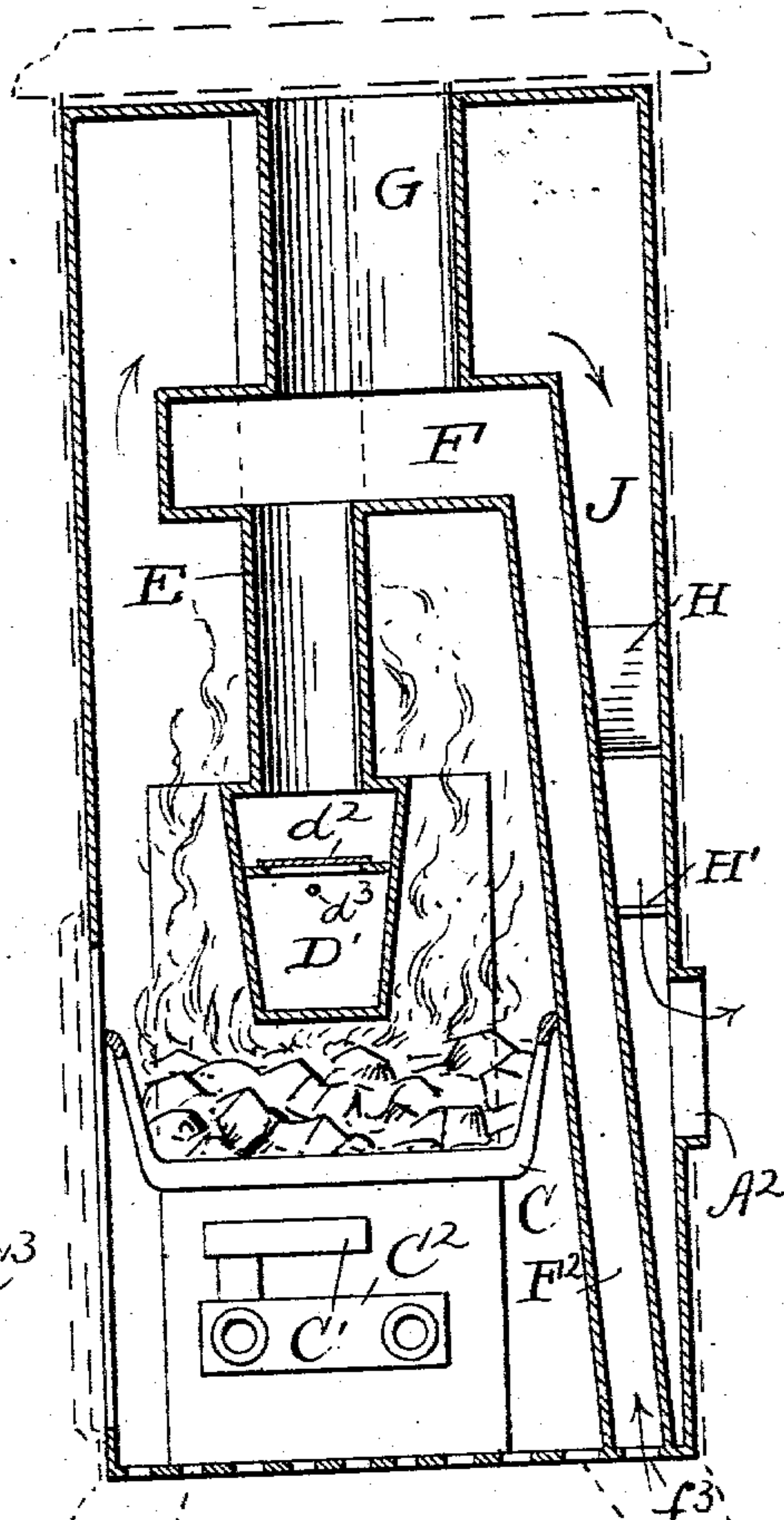


Fig. 5.

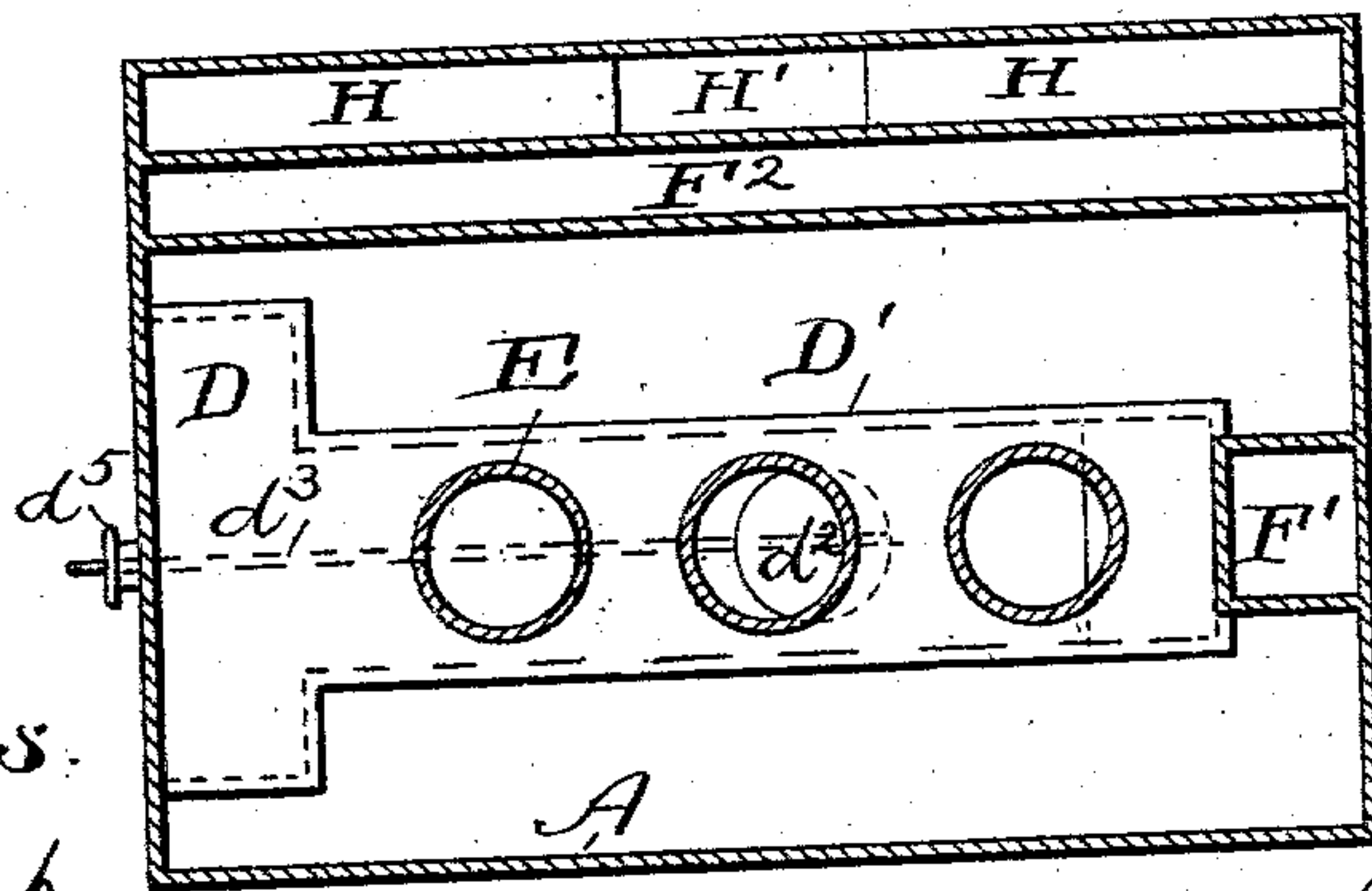


Fig. 6.

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# UNITED STATES PATENT OFFICE.

JACOB SOSENHEIMER, OF GALION, OHIO.

## HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 730,578, dated June 9, 1903.

Application filed February 4, 1903. Serial No. 141,851. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB SOSENHEIMER, a citizen of the United States, residing at Galion, in the county of Crawford and State of Ohio, have invented a certain new and useful Improvement in Heating Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

Hot-air heaters have heretofore been constructed for using gas or other fuel, and these constructions have had a drum exposed to the heat of the fire in such a way that the air inside of the drum will be heated and conducted away for heating purposes. Under many conditions this construction will operate fairly well; but when a very hot fire is used, as when natural gas is employed as a medium for fuel, it has been found by practice that the drum is heated so hot, and consequently the air inside to such an extent, that when this small volume of highly-heated air is discharged into a room the effect is that either all of the life is burned out of the air or else it is so small in quantity that it will heat only a small portion of the room. It has also been difficult in gas-stoves to regulate or control the amount of hot air which is given off by these devices except by reducing the size of the flame, which oftentimes takes the hottest part of the flame from the heating-surface of the air-drum, reducing the efficiency of operation.

The object of this invention, therefore, is to obviate the difficulties by, first, providing in connection with the ducts which lead from the heating-drum another duct which leads from the cold-air supply, so that the hot air will be mixed with cold air and the two will be discharged as warm air; secondly, providing in connection with the heating-drum a valve which will short-circuit the current of hot air over the flame, and will thus cut down the heat given off by the stove, and, lastly, providing suitable passages for conveying away the products of combustion and at the same time baffling out of contact with the heated air the progress of these products, so that the greatest possible amount of heat may be obtained from the fuel used.

Figure 1 of the drawings is a perspective view of a stove constructed according to my

invention with the stove-body or outer casing indicated by dotted lines and parts of the inner casing or stove proper and drum broken away, so as to more fully disclose the included parts. Fig. 2 is a rear view of the stove, showing the flue-pipe and having a portion of the back plate broken away, so as to disclose the flue for the products of combustion with the baffles arranged therein. Fig. 3 is a top plan with a portion of the casing broken away to more clearly show the passage between the baffles in the flue. Fig. 4 is a vertical sectional view through the width of the stove. Fig. 5 is a vertical sectional view from front to back, and Fig. 6 is a horizontal sectional view taken on the line 6 6 of Fig. 4.

Referring to the parts by letters, A represents the inner casing or stove proper of substantially the form shown in the drawings. This casing may be contained in any suitable stove-frame, as B. The casing A has a perforated or open bottom A', an exit-pipe A<sup>2</sup> in the back, and the openings A<sup>3</sup> in the top. Mounted above the bottom plate A' at any suitable height therefrom is the grate C, which may contain pieces of fire-brick to be heated by the gas-burners C' under the same. These burners are shown as connected by suitable pipes with a chamber C<sup>2</sup>, and inlet-pipes C<sup>3</sup> bring the gas to this chamber. Two of these pipes C<sup>3</sup> are provided, so that, if desired, one may be connected with a natural-gas main and the other with an artificial-gas main. If desired, the gas need not be used, but coal burned upon the grate; but I prefer to use natural gas.

At one side of the stove or any other suitable place I provide an air-inlet duct D, which communicates with the heating-drum D', arranged over the fire. This drum I have shown constructed in the form of a box, narrowing downward, so that it will present its side faces to the flame. Within this heating-drum D' is a plate d, which slopes from the top of the inlet end of said drum downward toward the opposite end thereof, leaving a passage around its end for the current of air as it is heated. Through the plate d is an opening d', which is arranged to be closed by a flap d<sup>2</sup>, hinged to said plate. This flap is opened and closed by means of the rod d<sup>3</sup>, pivotally connected



at its inner end to the arm  $d^4$ , secured to the flap, and at its outer end carrying the nut  $d^5$ , by which it is adjusted longitudinally.

Leading from the top of the heating-drum 5  $D'$  are pipes  $E$ , three being shown in the drawings, for the purpose of conducting away the air as it is heated in the drum. These pipes are connected at their upper ends with a mixing-chamber  $F$ , suitably mounted in the casing and having connected therewith cold-air 10 ducts  $F'$  and  $F^2$ , which extend, preferably, to the bottom of the casing, where they are supplied with air through the openings in the bottom plate and also in the sides, as shown 15 at  $f^3$ . Pipes  $G$  are arranged above the mixing-chamber  $F$  for carrying the warm air out into the room. The cold-air duct  $F^2$  extends across the entire width of the casing behind the grate and slants forward and upward 20 from the bottom to the point where it joins the chamber  $F$ , thus leaving behind it a flue  $J$  for the escape of the products of combustion. The mixing-chamber  $F$  does not extend to the front or to the rear of the casing, 25 so that the products of combustion are permitted to pass between the two, around the pipes  $G$ , and back to the flue  $J$  and out of the flue-pipe  $A^2$ . In passing down through the flue  $J$  just mentioned, between the vent  $F^2$  30 and the back of the casing, the products of combustion are baffled toward the center by two plates  $H$  and then out again away from the center by a third plate  $H'$ , when they are permitted to pass out of the flue-pipe  $A^2$ . By 35 this I mean their current is retarded and much of their heat given up to the air in the chamber  $F$  and duct  $F^2$ , thus heating that air. The additional duct  $F'$ , which discharges cold air directly into the mixing-chamber, is of 40 great value in increasing the quantity of air warmed to the proper temperature which my apparatus gives. I am thus enabled to obtain the maximum efficiency of the fuel while evenly heating the room.

45 It will be seen from the foregoing description that when the gas from the burner is ignited below the grate the pieces of fire-brick will be heated and the products of combustion, together with a few small flames, will 50 rise and surround the heating-drum  $D'$ . The heating of this drum necessarily heats the air within it, which passes up through the pipes  $E$  to the mixing-chamber  $F$ , where it receives a quantity of cold air from the cold-air ducts  $F'$  and  $F^2$ , after which it passes as 55 warm air through the pipes  $G$  out into the room.

If it is desired to have the quantity of highly-heated air which goes into the mixing-chamber 60 reduced in volume, the rod  $d$  is operated so as to open the flap  $d^2$ , which permits a portion of the air from the air-duct  $D$  to pass up through the opening  $d'$  and through the pipes  $E$  into the mixing-chamber without traveling 65 over the entire fire.

Having described my invention, I claim—

1. The combination of a casing, a heating

device, an air-heating drum cooperating therewith, an independent mixing-chamber located above said drum, pipes leading from 70 said heating-drum to said mixing-chamber, a cold-air duct leading directly to said mixing-chamber, and pipes leading from said mixing-chamber to the outside of the casing.

2. The combination with a heating device, 75 of a heating-drum cooperating therewith, an air-duct leading to said drum, an independent mixing-chamber communicating with said drum, a cold-air duct connected with said mixing-chamber, pipes for conducting away 80 the heated air from said mixing-chamber, and a casing containing the parts mentioned and providing between itself and the cold-air vent a flue for leading away the products of combustion. 85

3. The combination with a heating device, a heating-drum cooperating therewith, an air-duct leading to said drum, a mixing-chamber communicating with said drum, a cold-air 90 duct connected with said mixing-chamber, distributing-pipes leading from said mixing-chamber, and means for conducting away the products of combustion in proximity to the incoming air and baffling their progress.

4. The combination with the casing, a 95 burner mounted in said casing, an air-heating drum arranged over said burner, an air-duct leading to said drum, a mixing-chamber, pipes connecting said heating-drum with said mixing-chamber, cold-air ducts leading from the 100 outside of said casing to said mixing-chamber, pipes leading from said mixing-chamber to the outside of said casing, and a flue for conducting away the products of combustion.

5. The combination with a casing, a burner 105 within the same, a heating-drum over the burner, a passage for conveying the heated air from the drum, a cold-air duct communicating with said passage, said duct leading from the lower part of the apparatus and 110 leaving a flue between it and the casing, and baffle-plates in said flue.

6. In a heating apparatus, the combination of three ducts leading to a common discharge-opening, a heating-drum interposed in one of 115 said ducts, a burner in proximity thereto, means for conveying the products of combustion from said burner in proximity to another of said ducts, the third duct being out of the general course of said products of combustion, whereby a large amount of heat is absorbed from the fire and a large amount of 120 warm air delivered.

7. The combination with a casing, a burner mounted within the casing, a heating-drum 125 arranged over the burner, an air-duct leading to said drum, a mixing-chamber communicating with said drum, a cold-air duct leading to said mixing-chamber and leaving a flue between it and the casing, and an additional 130 cold-air duct communicating with said mixing-chamber.

8. The combination with the casing of a heating device within said casing, an air-



heating drum mounted above said heating device, a duct leading from the outside of said casing to said drum, a plate within said drum for causing the incoming air to pass toward the opposite end thereof, a suitable valve in said plate, a mixing-chamber within said casing, pipes connecting said drum and said mixing-chamber, a cold-air duct leading from the outside of said casing to the mixing-chamber, means for conducting away the heated air from said mixing-chamber, and a flue for conducting away the products of combustion.

9. The combination with the casing, of a burner mounted therein, a heating-drum suspended above said burner, an air-duct lead-

ing from the outside of said casing to said drum, a mixing-chamber communicating with said drum, a cold-air duct leading from the outside of said casing to said mixing-chamber and separating a portion of said casing off to itself for a flue, means for conducting away the heated air from said mixing-chamber, and baffles mounted in said flue for baffling the progress of the products of combustion.

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

JACOB SOSENHEIMER.

Witnesses:

M. S. METZENBAUM,

ALBERT H. BATES.