

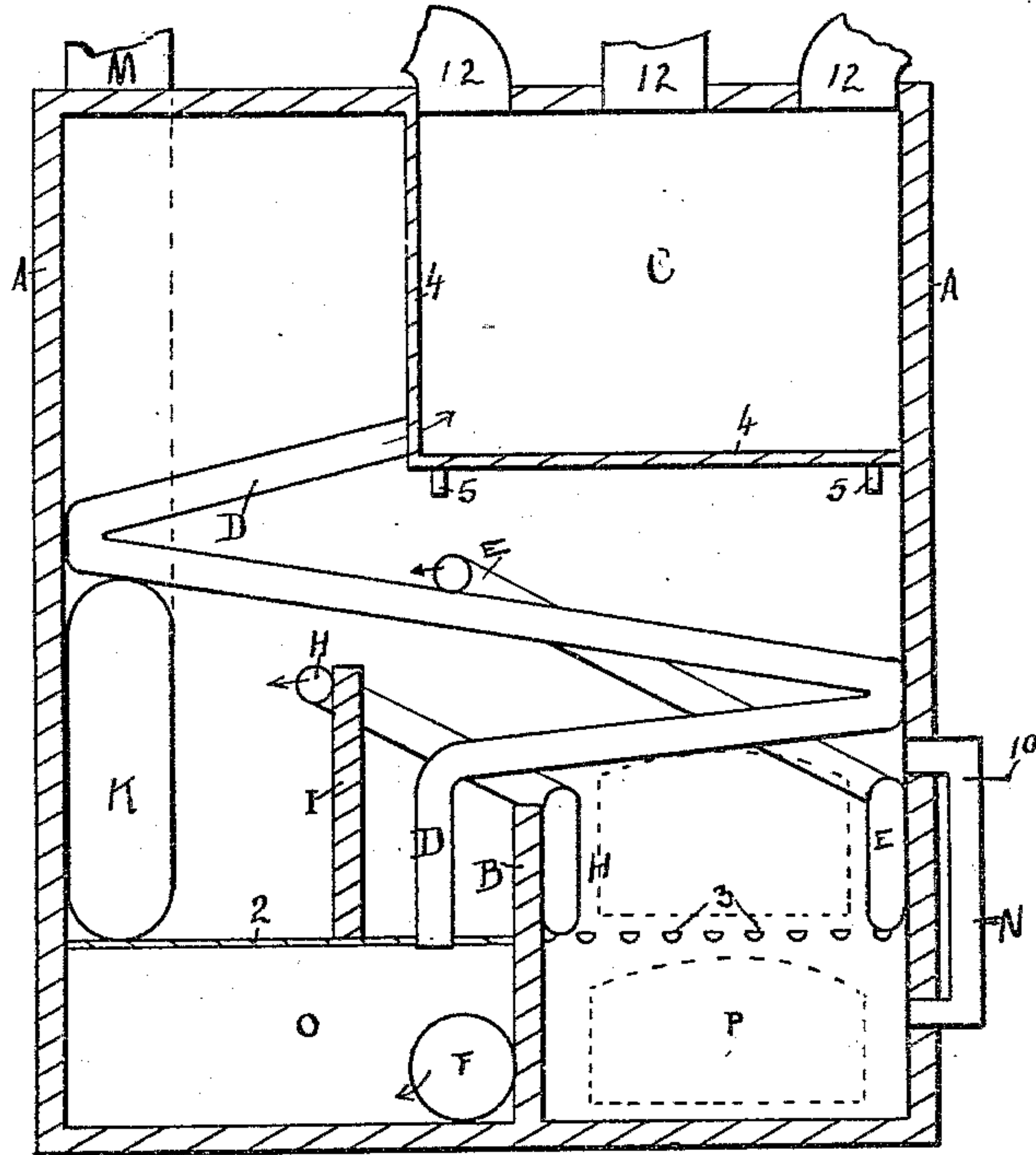
(No Model.)

W. L. ROSS.
FURNACE.

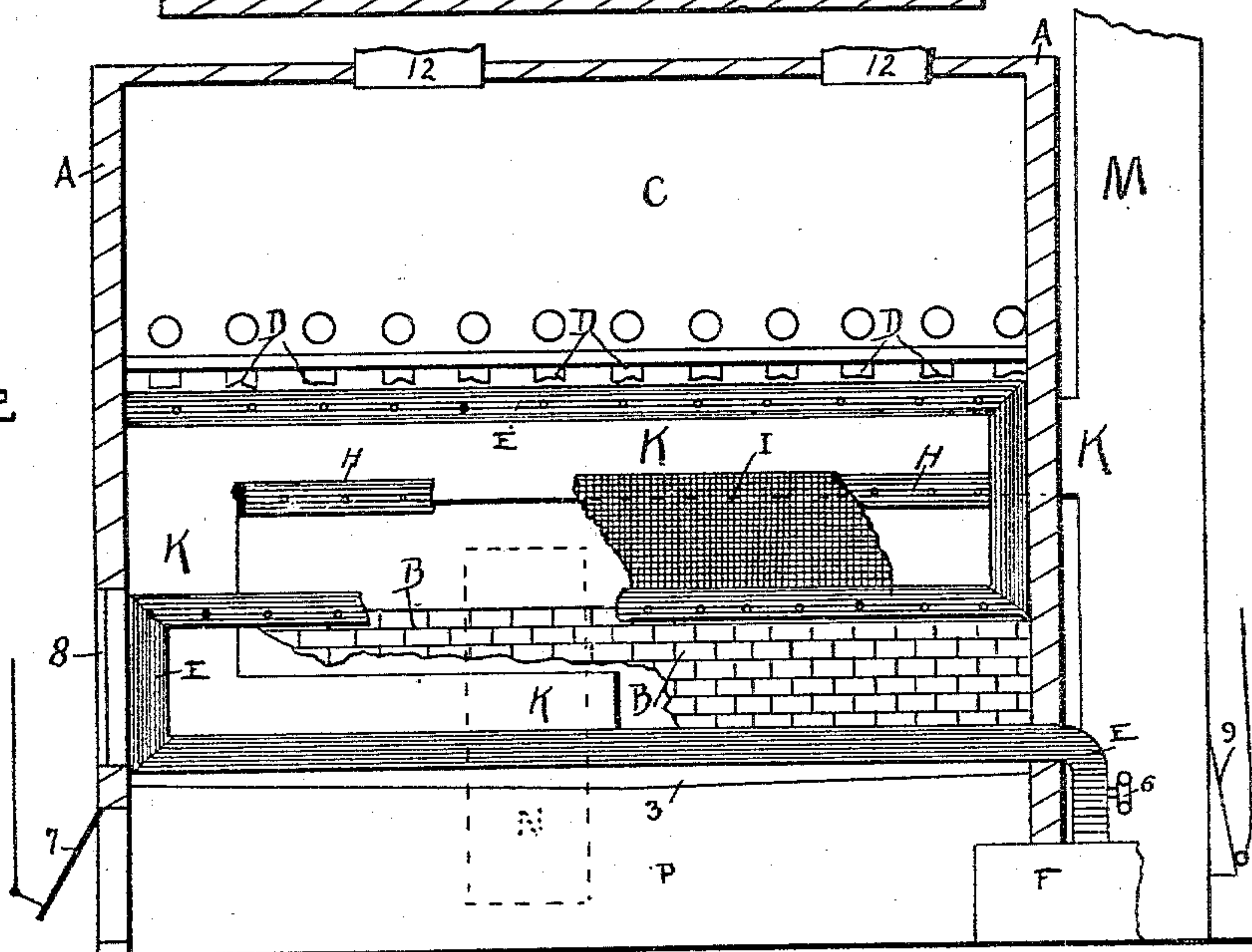
No. 561,817.

Patented June 9, 1896.

File 1



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WITNESSES:

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FURNACE.

SPECIFICATION forming part of Letters Patent No. 561,817, dated June 9, 1896.

Application filed January 9, 1895. Serial No. 534,405. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. ROSS, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain
5 useful Improvements in Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to
10 which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention has relation to a new and novel improvement in furnaces.

15 The object of my invention is to provide a fuel-economizing furnace.

In the accompanying drawings, Figure 1 shows an end sectional view showing the arrangement of the flues and tubes, while Fig.
20 2 shows a sectional side elevation with parts removed.

A represents a suitable casing, of any suitable size and material, through which I extend a wall B, as is shown more clearly in
25 Fig. 1. This wall divides the lower part of the furnace into two compartments O and P, the compartment O working in the capacity of a cold-storage chamber, while upon the opposite side the compartment P forms the ash-pit. The upper portion of the chamber O is
30 provided with a deck 2, so as to divide this chamber, while the upper portion of the ash-pit is provided with the grate-bars 3.

Extending from the deck 2 is a dividing-wall I, preferably extending the full length
35 of the furnace, as does also the dividing-wall B. Above I provide the furnace with a hot-air chamber C, which may extend the full length and may extend clean across, but preferably covers but one-half of the upper
40 portion of the furnace. Entering the cold-air chamber O is an ordinary supply-pipe F, led to without the furnace and building. Extending from this cold-air chamber are a series of pipes D, which are broken off in Fig.
45 2, which extend upwardly until they escape the wall B, and then laterally across the fire-pot and above the grate-bars until they strike the wall of the furnace, and from thence they
50 are again directed upward, and, again re-

curving, enter the hot-air chamber C, as is clearly shown in Fig. 1.

The fire-pot proper is provided upon each side with additional hot-air flues, which communicate with the fresh-air-supply pipe F, as
55 is shown in Fig. 2. These tubes E are provided with a valve 6 and extend from the supply-pipe F upward and enter the furnace on the grate-line, then pass forward upon one of the grate-bars until the forward portion
60 of the furnace is reached, when they extend upward and then rearward approximately the height of the wall B, this upper rearward extension of the pipe being perforated, as shown in Fig. 2. This pipe E is
65 then extended upward and again passes forward in the shape of a reversed letter S, the upper portion also being perforated and adapted to lie approximately in the center of the furnace and rest upon the pipes D, which
70 can be secured by any suitable means. Upon the opposite side a pipe H extends from the supply-pipe F and passes forward upon one of the grate-bars until the forward portion of the furnace is reached, then upward, having
75 a perforated extension rearward the height of the wall B, as is shown in Fig. 1, and then extending upward and forward again and resting upon and being supported by means of the dividing-wall I, as shown in Fig. 1.
80 These pipes also would form a reversed letter S.

The smoke-stack I have provided between the walls I and the outer walls, and it comprises a large pipe K, which begins approximately on the grate-line of the furnace and centrally within the furnace, as is shown in
85 Fig. 2. It then passes upward a suitable distance and then outward, where it enters the stack M. The smoke and products of combustion from the fire-pot of course will mingle
90 within the whole furnace, and, passing between the pipes D, E, and H, finally have to settle at the bottom of the furnace in order to be carried out. Upon the side I have, further, a communicating flue N, which extends
95 from the ash-pit P into the fire-pot proper above the pipes E, and being provided with a regulating-valve 10. The hot-air chamber C is supported by means of two supporting-
100

bars 5. In front I provide the ash-pit P with the door 7, which can be regulated from without. The smoke-stack M is also provided with a damper, which enters the stack below the pipe K, as is shown.

When properly arranged, the operation of my furnace would be as follows: The fire of course would be built upon the grate-bars 3 and the heat would rarefy and heat the air within the pipes E, part of which air would escape to feed the flames within the fire-pot and the remainder passing upward and escaping at the upper end of the tube E, where it would mingle with the smoke and thus provide oxygen for the same. The pipe II would in the same manner furnish pure air for the flames at the fire-pot, and the rest extending upward and passing along the wall I immediately above the lower leg of the pipe K, where this fresh air would further aid in reducing the smoke. The pipe II is led upon the outside for convenience sake into the supply-pipe F, so that it gets its supply of fresh air direct from this pipe. Of course it could be led into the cold-air chamber O, but for convenience sake, as stated, this pipe II is led directly in the pipe F. In Fig. 2 the forward pipe E, which is also directed into the pipe F, hides the pipe II, as they both lie in the same plane, and in understanding the device the position of the pipe II may be determined in following lines of the pipe E as they enter the pipe F. The air within the tubes D would of course be heated and, passing upward, enter the chamber C, from which it would be conducted through the pipes 12 to the building. A draft through the ash-pit P can be regulated through the door 7. Part of this again can be directed above the fire 40 by means of the communicating flue N. The

device in its use acts as a smoke-consuming furnace and, as such, a fuel-saving device. To prevent any gas within the furnace from escaping into the building, I do not check its means of escape, but take the draft from it, 45 in that the door 7 can be closed, preventing all access of fresh air to the fire-pot, while at the same time the air is permitted to enter at the valve 9, forming part of the smoke-stack M, so that the gases will still be permitted to 50 escape out of the pipes K.

Now, having thus described my said invention, what I claim as new, and desire to secure by United States Letters Patent, is—

In a furnace, the combination of the following instrumentalities, to wit: a vertical dividing-wall within the furnace dividing the furnace into two communicating chambers, one of said chambers being provided with a horizontal partition, providing a cold-air 60 chamber, the remaining chamber being provided with a horizontal grate dividing said chamber into an ash-pit and fire-pot, a second vertical wall extending above said cold-air chamber situated between said fire-pot 65 and vertical dividing-wall the outlet for the products of combustion being at the bottom of said chamber a hot-air chamber within the upper end of said furnace and a system of pipes extending from said upper hot-air chamber 70 and recrossing within the furnace and entering said cold-air chamber, all substantially as and for the purpose set forth.

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

WILLIAM L. ROSS.

Witnesses:

CHARLES L. THOMAS,
G. W. SUES.