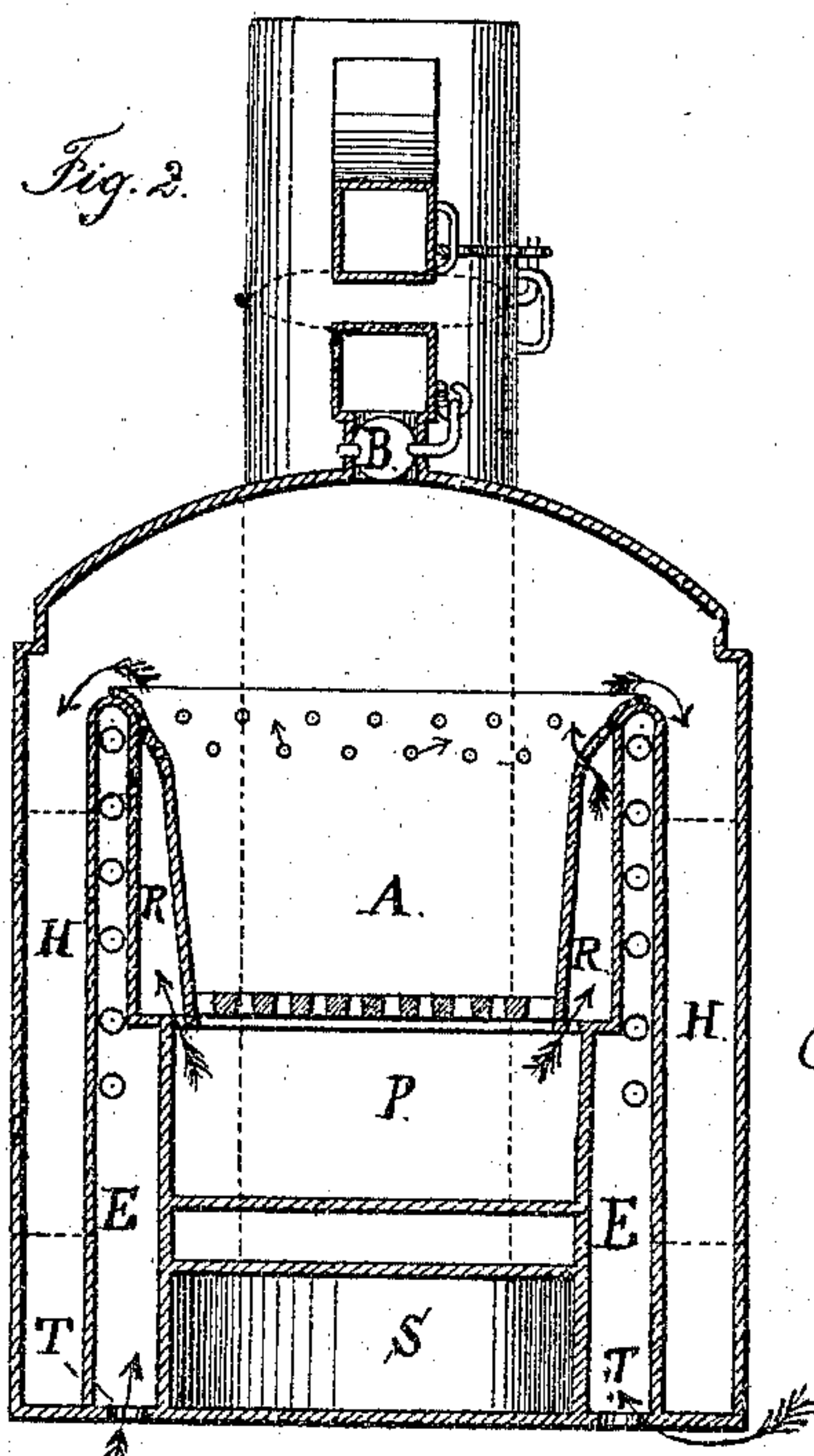
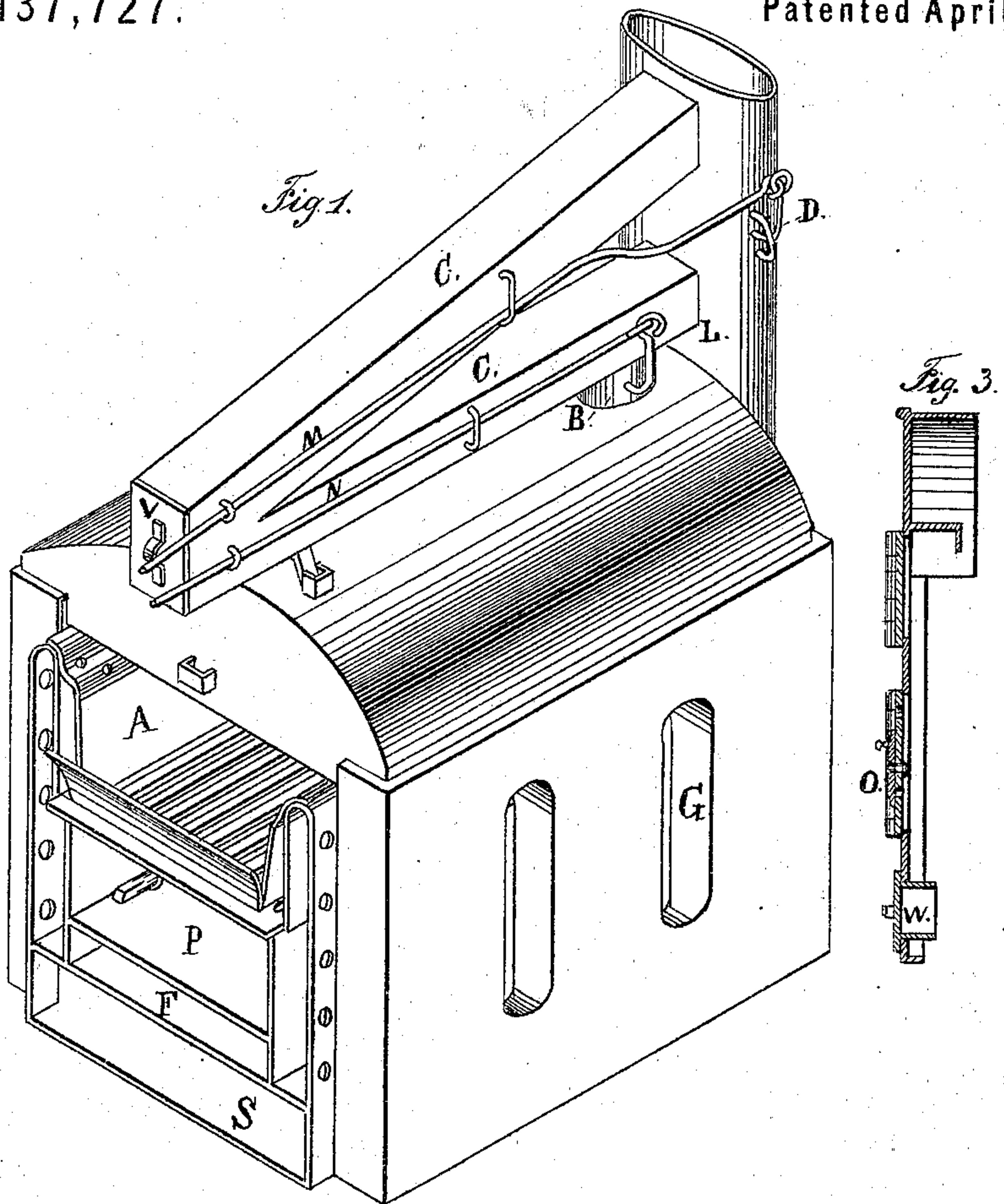


M. D. SEWARD.  
Hot-Air Furnaces.

No. 137,727.

Patented April 8, 1873.



WITNESSES:

*Thos. Lauten.*  
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# UNITED STATES PATENT OFFICE.

MAURICE D. SEWARD, OF NORMAL, ILLINOIS.

## IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **137,727**, dated April 8, 1873; application filed July 23, 1872.

*To all whom it may concern:*

Be it known that I, MAURICE D. SEWARD, of Normal, in the county of McLean and State of Illinois, have invented certain Improvements in Hot-Air Furnaces and Stoves, of which the following is a full description:

In the accompanying drawing, Figure 1 is a perspective view of my improved furnace without the outer casing, and with the front plate removed. Fig. 2 is a transverse vertical section of the same. Fig. 3 is a detached view of a vertical section of the front part of the furnace, the doors being closed and front plate in place.

My invention relates to that class of heating-furnaces and stoves which have descending or diving flues; and it consists in a novel arrangement of the air-chambers in relation to the fire-chamber and descending flues, and of the smoke-pipes or passages, dampers, and cleaning-holes.

In my improvement I admit the cold air at the bottom of the furnace or stove and bring the same directly in contact with the outer wall of the fire-chamber, and between the fire-chamber and the descending flue or sheet of fire, thus heating the air very rapidly, and also preventing the walls of the fire-chamber from being overheated or burned out. I also employ secondary air-passages, giving a large amount of radiating surfaces; and by a simple arrangement of two dampers I conduct the smoke or fire through more or less winding circuits at pleasure, and thus utilize the heat in the best manner; and yet my furnace is very compact and easily cleaned.

In the accompanying drawing, A represents the fire-chamber, which is provided with a main or back smoke-pipe, L, extending to the bottom of the furnace below the ash-pit. The direct draft passes through the damper B at the top of the fire-arch, and then through the damper D in pipe L. These dampers are operated by the two wires or rods M and N, in the usual manner. By closing the damper D and opening damper B the smoke and fire pass to the left along pipe C, and then return in the upper branch of pipe C to the pipe L; but when both of these dampers B and D are closed the smoke and fire will pass from the fire-chamber into the descending or

diving flues H, and entering under the ash-pit near the front of the furnace they will pass back to the rear pipe L, and then rising to the damper D will make the circuit of the folded pipe C, and finally return to the pipe L above the damper D, and thus pass into the chimney. During this long circuit of the fire the heat is completely radiated, and the fire is also checked. Again, by closing the damper B and leaving the damper D open the fire will descend through the diving-flues H, and passing along the bottom of the furnace will ascend through the pipe L and damper D. It should be observed that the descending flues H extend the whole broad sides of the furnace, and yet are divided by the necks G into several passages, so as to prevent the descending sheet of flame from passing obliquely and heating the flues unevenly.

Thus by my improved arrangement, and the use of only two dampers, I can obtain four different drafts, by which means I have complete control of the fire, the heat being more or less radiated or absorbed by the air or air-chambers yet to be described.

The air for supporting the combustion is admitted by the damper O and ash-pit P, and a small portion of air passes through holes into spaces R, Fig. 2, where it is heated, and then by another series of small holes enters the fire-chamber above the fuel, thus facilitating the combustion of the smoke and gases rising from the fuel.

As already mentioned the cold air is admitted through openings T into side chambers E at the bottom of the furnace, between the descending flues H and the central flue or fire-passage S, which enters the bottom of pipe L; then the air immediately rises in the chamber E between the fire-chamber A and the descending flues H into the hottest part of the furnace, where it is soon heated and passes off through openings G at the sides, thus constantly cooling down the walls of the fire-chamber, and preventing the castings from burning. Below the ash-pit is an air-chamber, F, Fig. 1, communicating with chambers E, so that a large volume of tempered air is always contained in the lower part of the furnace ready to rise as the current passes off above.

My arrangement gives an immense amount of radiating or heating surface, and also equalizes the heat of the furnace. This plan may be applied to different forms of furnace and also to stoves. The pipes C may be cleaned by removing the door V, the dust falling in part through damper B or into pipe L; and the lower part of the furnace and this pipe L may be cleaned at the bottom, in front, by removing door W.

Having described my invention, I claim—

1. The above-described construction and arrangement of furnace, having the two long and narrow air-chambers E, arranged in re-

lation to and in combination with the two exterior descending flues H, the interior or central flue or fire-passage S, the ash-pit P, air-chamber F, and fire-chamber A, substantially as set forth.

2. The arrangement of the pipes C and L in connection with the two dampers B and D, thus giving four different drafts, substantially as set forth.

MAURICE D. SEWARD.

Witnesses:

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W. P. BROPHY.