G. E. WALLIS.

Hot-Air Furnace.

No. 162,436. Patented April 20, 1875.

Fig. 1.

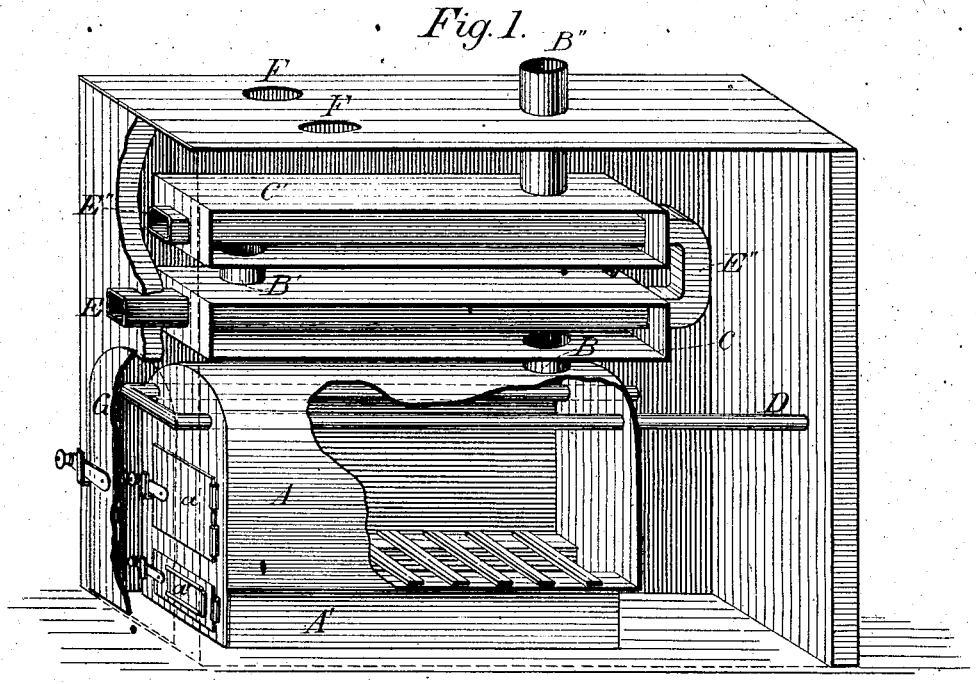
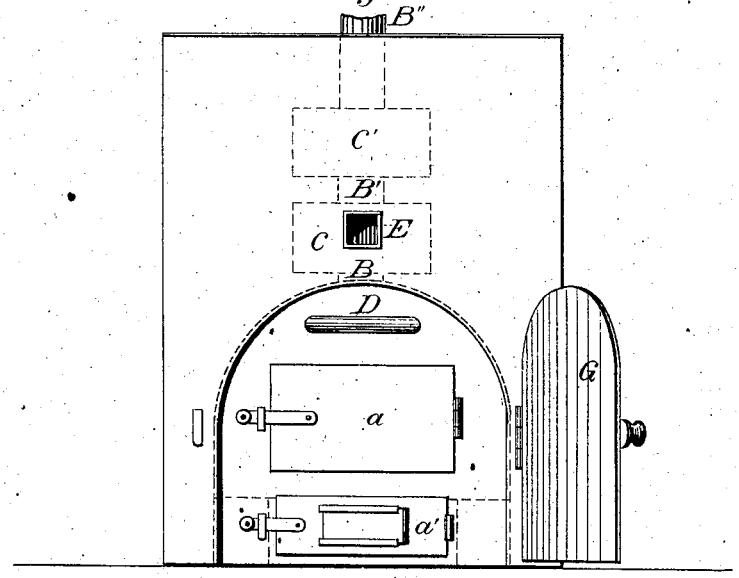


Fig. 2.



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UNITED STATES PATENT OFFICE

GEORGE E. WALLIS, OF OWATONNA, MINNESOTA, ASSIGNOR OF ONE-HALF HIS RIGHT TO SEARLE & DYNES, OF SAME PLACE.

IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **162,436**, dated April 20, 1875; application filed March 22, 1875.

To all whom it may concern:

Be it known that I, GEORGE E. WALLIS, of Owatonna, in the county of Steele and State of Minnesota, have invented certain new and useful Improvements in Hot-Air Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view, showing the furnace in position, with part of the walls removed to disclose the detail of construction. Fig. 2 is a front elevation.

The object of this invention is to provide a hot-air furnace, into and through portions of which air-pipes shall be led in such system and arrangement as will not only utilize the utmost capacity of the heat evolved from the fuel in the fire-place proper of the furnace, but also from the products of combustion passing in the escape-flues, as will be more fully explained hereinafter; and it also consists in the detail of the construction and arrangement of the several parts of the hot-air furnace, which is the subject of present invention, substantially as will now be more specifically set forth.

In the accompanying drawing, A denotes the chamber of combustion, or fire-place proper, which is provided with any suitable grate and supplied with fuel in the usual manner through the door *a*. Below it is the ash-pit, &c., A^1, which has the usual door *a'*, which may or may not have a draft damper or wheel in it. B is the exit-pipe, extending from the upper portion of said chamber A, and connecting with the drum C. This drum is made in length and width of any suitable size, but ordinarily to correspond with the horizontal section of the fire-chamber. Usually said pipe B enters at the lower side of said drum, near its rear, while from its upper side, near the front, another pipe, B', connects it with an upper drum, C'. This drum is in shape and size the counterpart of the other drum. From the upper side of the last drum, and near the rear end, the escape-flue B'' rises and connects with the chimney in the usual way. I have shown in the present illustration of my invention two two of these drums, but I design to use as few or as many as I can dispose or arrange to advantage in any given instance; and I may sometimes find it advisable to reverse the course of the products of combustion and place the immediate exit from the chamber of combustion at its front rather than the rear, as now shown and above described, and change the inlets and exits from the several drums to correspond therewith.

In order more effectually to utilize the heat within the chamber of combustion, I introduce through the exterior casing of the furnace a pipe, D, of any suitable size, which is extended through the rear wall of the furnace into the upper part of the chamber of combustion, and thence passes out of said chamber through the front, and by an elbow is returned through said chamber and out of the rear wall of the furnace, when it opens into the hot-air chamber.

I have now shown only this simple arrangement of the pipe, but obviously a more complicated arrangement could be made, or several distinct pipes could be used without in the least changing the nature or purpose of this part of my invention. I have found that ordinarily for this pipe or pipes gas-tubing will answer all my purposes.

I likewise extend from the exterior casing of the furnace in front, through the lower drum C, a pipe or tube, E, of any suitable shape. This is so arranged within said drum as to leave ample space for the flow and circulation of the products of combustion through the said drum and over and around said pipe on all its sides. At the rear of said drum this tube is connected, by an elbow, E', with a like tube or pipe, E'', in the upper drum C'. This pipe E opens out of the front end of the said drum C' into the hot-air chamber.

While in the details of construction and arrangement there are some differences between the said pipes D and E E' E'', the use and purpose of both are very similar, namely, to bring into the hot-air chamber or space inside the furnace-walls, whence the heated air is

drawn off to the living apartment, an abundant and constant supply of fresh air, and while this is done, to make sure that this supply shall not cool off the heat in said chamber or space. I have now shown said pipes or tubes as opening into the cellar or chamber where the furnace is placed; but I may, as suits my pleasure, extend either one or both of said pipes to the exterior of the dwelling or building, and take the supply of air fresh from the outside.

I have found in use that it is of great advantage in very cold climates to heat the incoming fresh air; the common method of admitting cold air directly to the hot-air chamber or space about the heater and its pipes tends to cool off the heat in a very great degree, and seriously lessens the effective heating force of the furnace. If desired, I can place at suitable points in pipes or tubes D and E E′ E″ dampers to cut off or regulate the inflow of fresh air.

Suitable arrangements may be made to take off the hot air to the several apartments by pipes conecting at exits F F, or at any convenient point or points in the sides or top of the casing.

I have shown my heater as provided with suitable doors, and placed inside the walls proper or casing of the furnace, and to afford convenient access to the said doors I have provided an opening in the front of the casing with a door, G. By this means there is very little, if any, chance for radiation of heat beyond the walls or exterior casing, and it can be all utilized for heating purposes without waste or loss.

Having thus described my invention, what I consider novel, and desire to protect by Letters Patent, is—

The hot-air furnace herein described, consisting of the heater A A′ and drum C C′, with their connecting-pipes, and the air-tubes or pipes D and E E′ E″, constructed and combined substantially in the manner and for the purposes set forth.

In testimony that I claim the foregoing as my own invention, I affix my signature in presence of two witnesses.

GEORGE E. WALLIS.

Witnesses:
W. A. DYNES,
D. S. HARSHA.