

T. WHITWELL.
Fire-Places.

No. 157,709.

Patented Dec. 15, 1874.

Fig: 4.

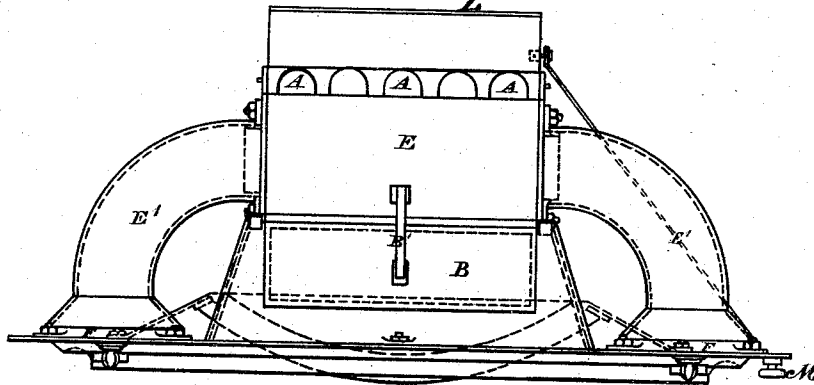
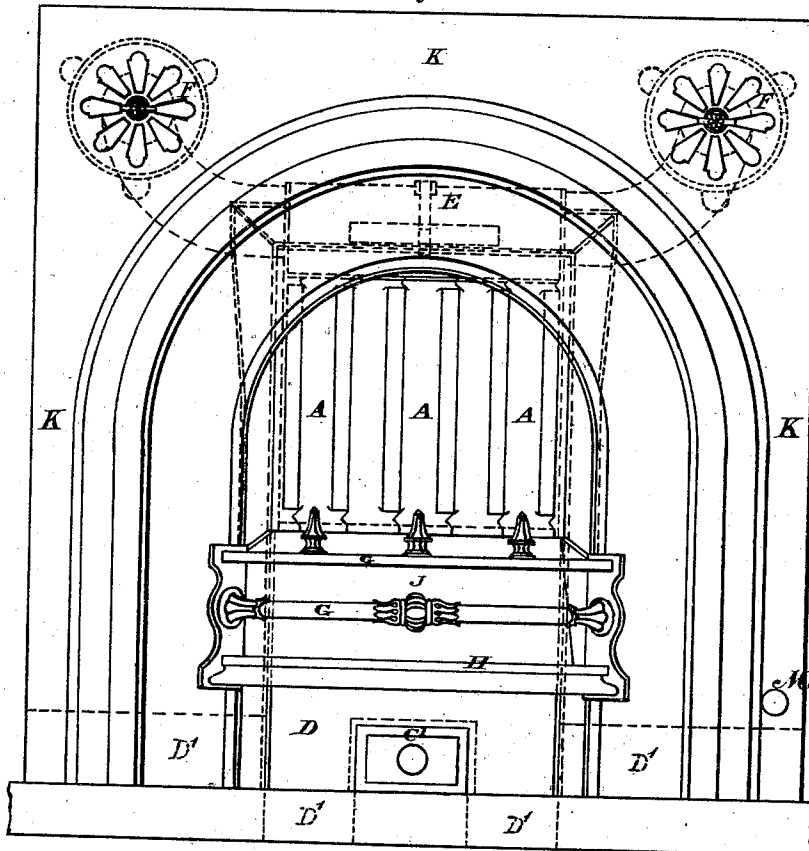


Fig. 1.

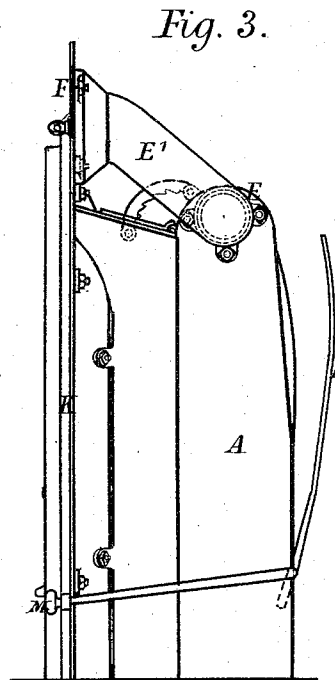
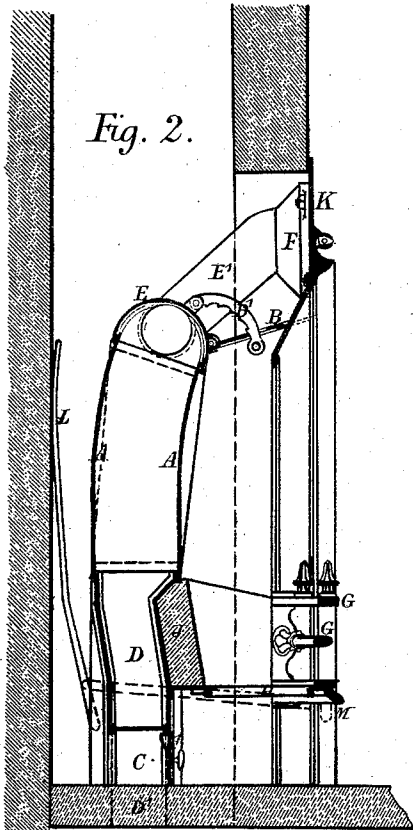


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Fig. 7.

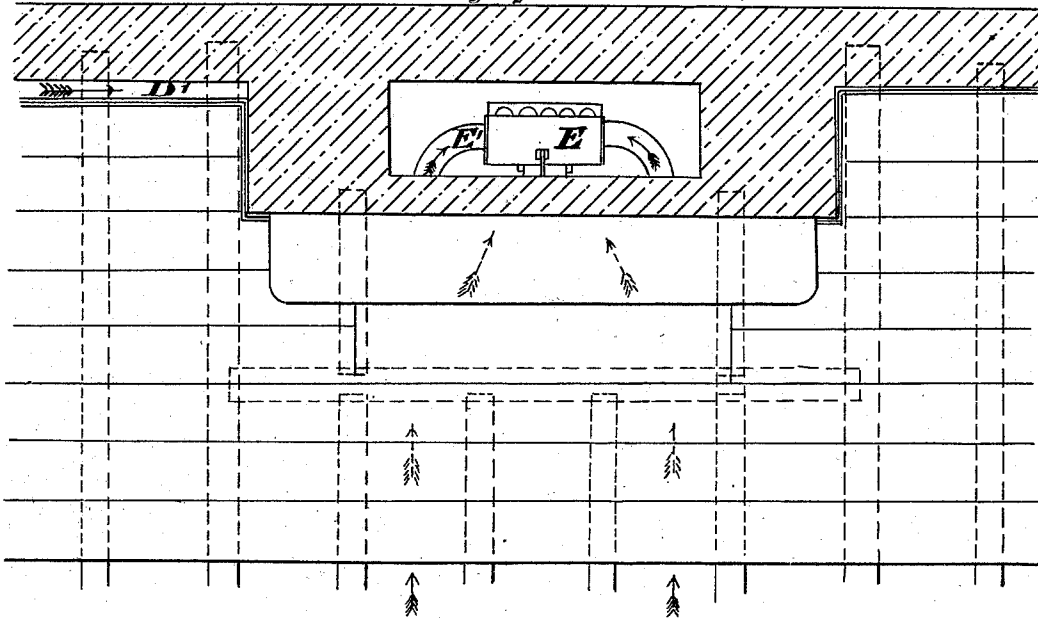


Fig. 6.

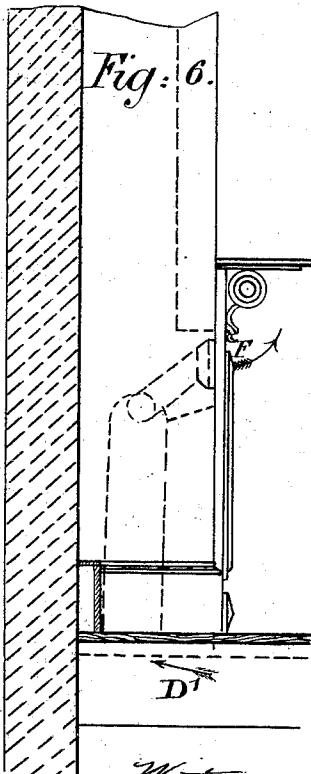
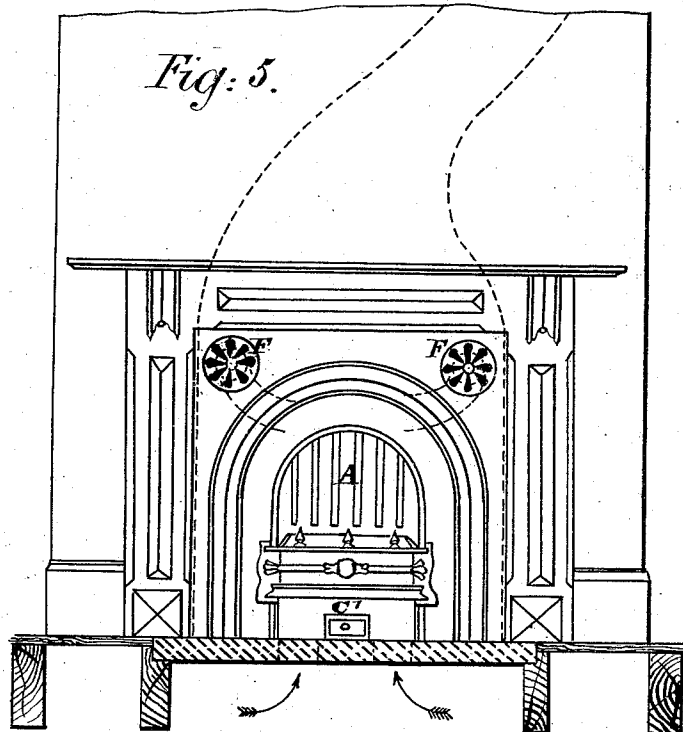


Fig. 5.



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Fig. 10.

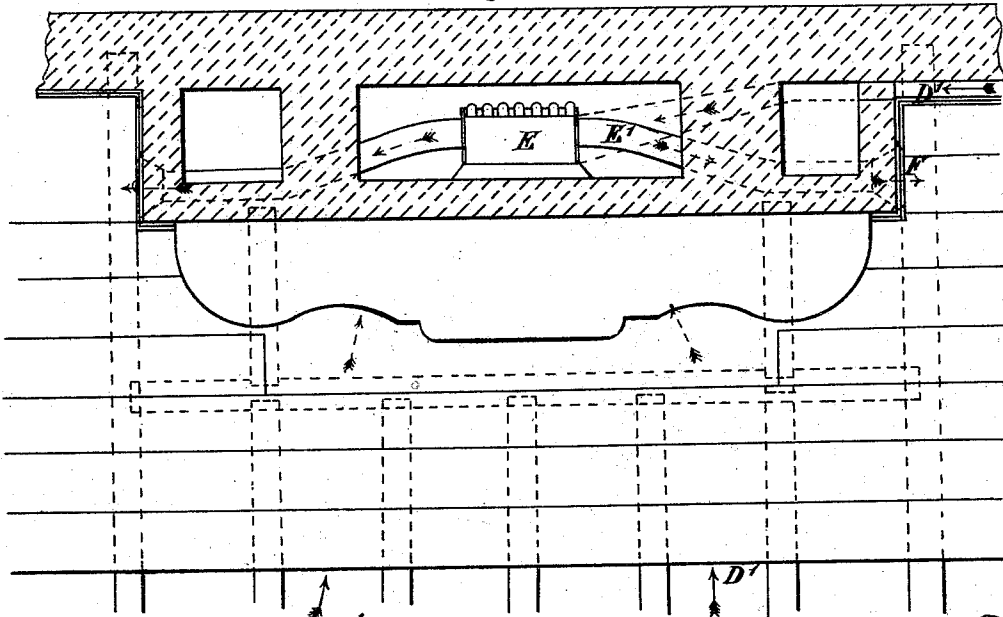


Fig. 8.

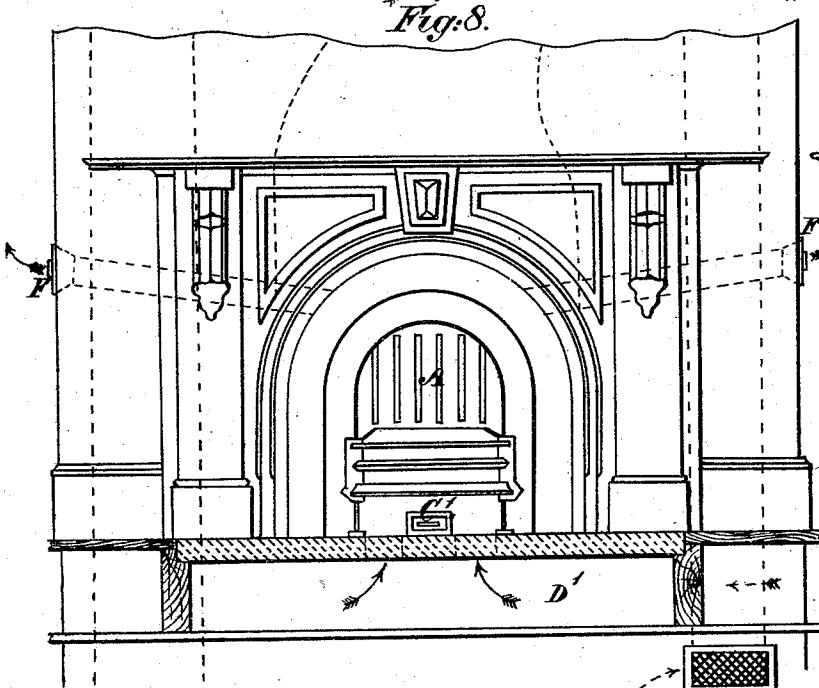
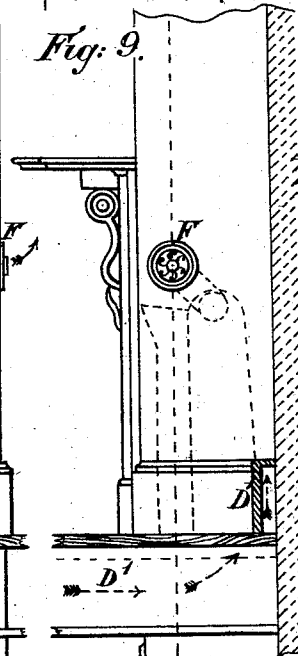


Fig. 9.



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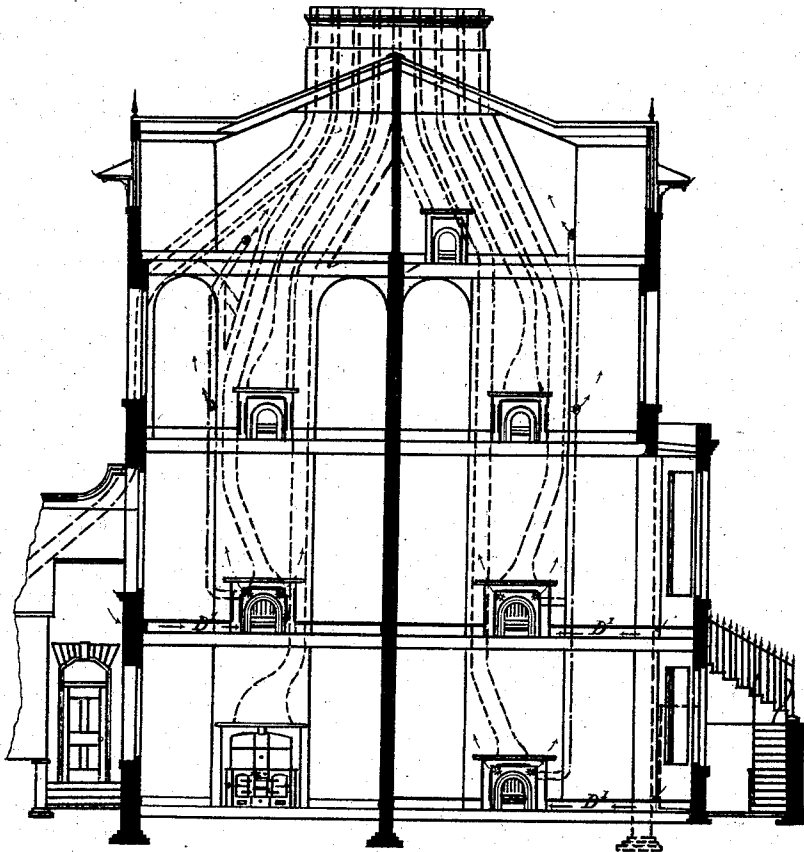
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Fig. 11.



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UNITED STATES PATENT OFFICE.

THOMAS WHITWELL, OF THORNABY IRON-WORKS, STOCKTON-ON-TEES,
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IMPROVEMENT IN FIRE-PLACES.

Specification forming part of Letters Patent No. **157,709**, dated December 15, 1874; application filed March 4, 1874.

To all whom it may concern:

Be it known that I, THOMAS WHITWELL, of the Thornaby Iron-Works, Stockton-on-Tees, in the county of Durham, England, a subject of the Queen of Great Britain, have invented or discovered new and useful Improvements in Fire-Places and Stoves; and I, the said THOMAS WHITWELL, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof—that is to say:

My invention relates to open fire-places and stoves in which the waste heat passing up the chimney, or into the brick-work behind or around, is utilized by being made to warm fresh air, which is passed through tubes of a suitable form placed so as to intercept the escaping heat, such air, when warmed, being admitted into the room or space to be warmed.

I am aware that pipes and tubes, in a great variety of forms and positions, have been suggested for heating external air for warming rooms and buildings, but that such apparatuses have hitherto so far failed to answer their ends as not to have come into general use; and my improvements have in view such an arrangement of pipes or tubes as, with a due reference to their section and position, and the means of controlling the action of the heat upon them, and of getting at them to clean them and their attachments, shall render the apparatus practically serviceable for the end for which it is designated, viz., warming fresh air and delivering it into rooms.

My improvements will be best understood by reference to the accompanying drawings, in which Figure 1 is the front view of an open fire-place of ordinary construction, but to which my improvements are added. Fig. 2 is a cross-section taken through the vertical center line. Fig. 3 is a side view in elevation. Fig. 4 is a plan seen from above. In Sheets 3 and 4 the application is shown in a more general form, where Figs. 5 and 8 are front views of the fire-places on a lower and upper room, respectively. Figs. 3 and 4 are side views, and Figs. 5 and 6 plan views, of the same. Fig. 11 shows, in cross-section, the general ap-

plication of the whole system to one of a block of houses of ordinary middle class.

In Figs. 1 and 2 are shown the pipes A A A for warming the air, of the general form and arrangement I prefer to employ: These pipes and the spaces between them do not fill the whole area of the passage provided for carrying the products of combustion to the chimney; but above them, and between the upper cross-pipe E and the front plate K of the fire-place, is a door or valve, B, which may be in one or more sections. This door may be notched at various degrees of opening by the rack B', and is for the purpose of controlling the course of the escaping gases, so as either to compel them to pass away entirely between the tubes, and so give up the maximum amount of heat to be extracted from them, or to let a part or the whole of them escape directly up the chimney, so reducing or removing their action from the air in the tubes. In order also more perfectly to control the course of the escaping gases, I employ a door or doors or regulators, L, moved by the handle M from the front of the stove, to more or less open or close the passages between the tubes. These doors or regulators also serve to close in the apparatus when out of use, and prevent soot and dust coming from the chimney into the room or chamber where the apparatus may be placed. The total area of opening between the tubes I prefer to make sufficient to carry away the whole of the products of combustion, so that the whole heat obtainable from them may be utilized, the door B being closed. Each opening is of such a size as to admit suitable brushes or instruments for cleaning the same from soot deposited on them; also, the door B should have a like capacity, that when fully open, being the readiest way to the chimney, the gases will chiefly pass up it. The air-pipes shown at A A A are preferably of a flattened oval figure, jointed into the lower box or cold-air chamber D, which communicates with the external atmosphere by the air-flues D' D', which may either be carried under the floors or within the skirting-board, or other suitable way. The pipes A A A open at their upper ends into a

cross-pipe, E, which, by suitable connections E' E', open out under the mantel-shelf or at the sides, as shown in Figs. 8, 9, and 10; or they are conducted upward to other rooms, as shown in Fig. 11, under various modifications. In each case these openings are controlled by valves or "hit-and-miss" slides, as shown at F F. The fire-place may be of the ordinary construction, with the bars at G, the grate at H, and the back-block at J, by which means the air is prevented from being burned by too close contact with the red-hot fuel. The door B, Figs. 2, 3, and 4, also answers for the admission of the apparatus for sweeping the chimney, and for clearing away all soot that may lodge on the upper parts of the apparatus, which can be done thus without removing or displacing the tubes or any of their attachments. It is also available for using the full draft of the chimney at the time of lighting the fire when all is cold and the natural draft most sluggish. For clearing away the soot and dust from the lower parts of the apparatus, the opening C (of which there may be either one, as shown, or two or more, placed

as convenient) is arranged in such position as to give facility for clearing away all soot and dust that may accumulate behind the apparatus, or that may be swept down from the upper parts. Such openings will be closed by a lid, C', or lids, when not used.

Having now fully described the nature of my said invention, and the manner in which the same is to be performed, I would have it understood that I do not claim the use of tubes, or heating air in open or closed fires; but—

What I do claim is—

1. The combination of the grate, the cold-air chamber D, the heating-pipes A, the hot-air chamber F, and the doors B and L, substantially as hereinbefore set forth.

2. The combination of the heating-pipes A, and the door L at the back thereof, substantially as set forth, whereby the heat passing between the pipes is regulated.

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