

June 21, 1938.

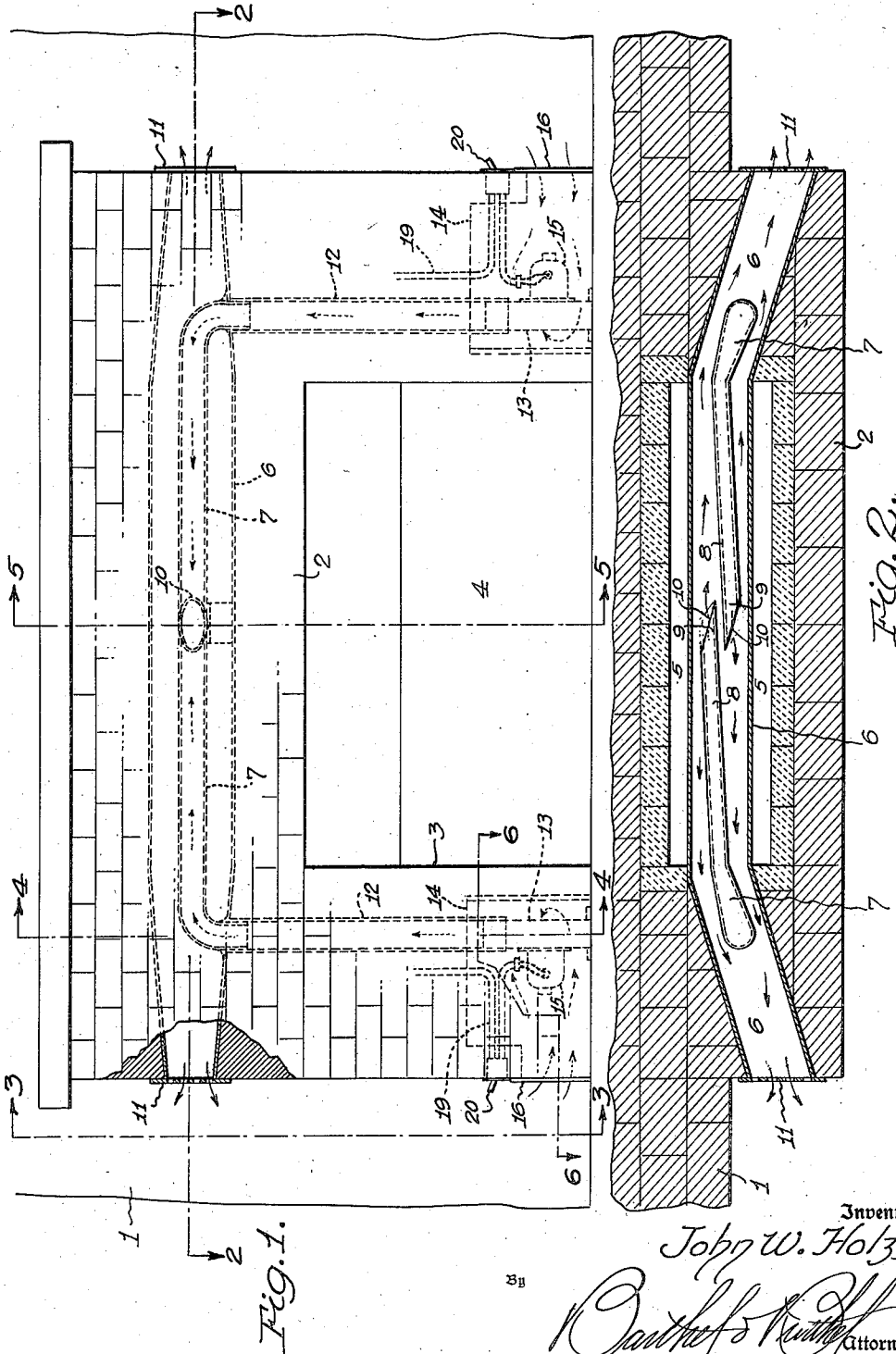
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2,120,977

FIREPLACE

Filed June 30, 1937

2 Sheets-Sheet 1



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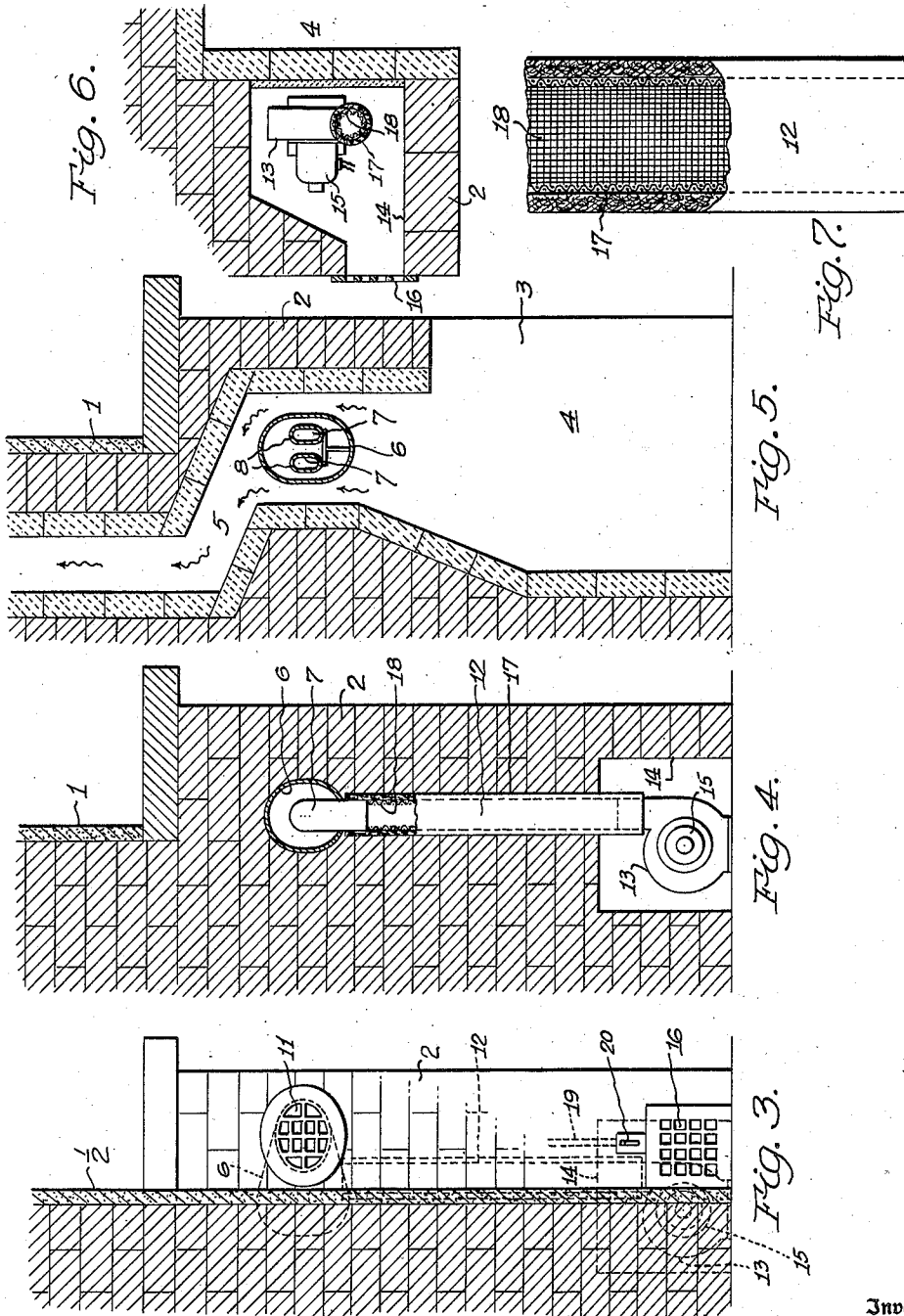
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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FIREPLACE

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Application June 30, 1937, Serial No. 151,152

8 Claims. (Cl. 126—121)

This invention relates to a fireplace and more particularly to a construction and arrangement for heating the air by means of the heat within the fireplace and causing the air to circulate within the room into which the fireplace opens.

An object of the invention is to provide a simple construction wherein air is drawn from the lower part of the room into which the fireplace opens and is circulated in contact with the heated walls of the fireplace and then discharged into a higher room level to cause a circulation of air within the room and to heat the air so circulated.

A further object is to provide simple and efficient means for the purpose including a motor driven fan or blower and providing conduits through which the air is forced by the blower, cool air being taken in adjacent the floor level of the room, circulated through the conduit or conduits extending adjacent the fireplace where the air is heated and then discharged from the conduit at a point elevated above the inlet. It is also an object to provide an arrangement of conduits having discharge ends opening in opposite directions within a tubular member extending across the flue for the fireplace whereby the air within the tubular member is heated by the hot products of combustion passing up the flue and a circulation of air is set up through said tubular member.

A further object is to provide an arrangement whereby air is drawn in adjacent the floor level at each side of the fireplace and is conducted from each side of the fireplace upwardly and across the upper side of the fireplace and discharged at a level adjacent the upper part of the fireplace. It is also an object to provide certain other new and useful features in the construction, arrangement and combination of parts, all as hereinafter more fully set forth, reference being had to the accompanying drawings wherein,

Figure 1 is a front elevation of a fireplace illustrative of an embodiment of the present invention and showing portions broken away and in section to more clearly disclose the construction;

Fig. 2 is a horizontal section substantially upon the line 2—2 of Fig. 1;

Fig. 3 is an end elevation of the fireplace showing a section through the adjacent wall substantially upon the line 3—3 of Fig. 1;

Fig. 4 is a vertical transverse section substantially upon the line 4—4 of Fig. 1;

Fig. 5 is a transverse section substantially upon the line 5—5 of Fig. 1;

Fig. 6 is a sectional detail substantially upon the line 6—6 of Fig. 1, and

Fig. 7 is a sectional side elevation of a flexible conduit for the circulated air.

As shown in the accompanying drawings, 1 indicates a brick wall of a building and 2 the projecting brick fireplace. This fireplace has the usual rectangular opening 3 which opens directly into the room of the building and leading from this open fire chamber 4 is the usual flue 5 for conducting away the products of combustion of the fuel burned in the chamber 4.

Set within the brick walls 2 of the fireplace is a transverse tubular conduit 6 which extends transversely of the fireplace and transversely across the flue 5 above the fire chamber 4. Extending into this conduit 6 are suitable air pipes 7, one for conducting air from each side of the fireplace into the horizontally extending air conduit 6 and the adjacent ends of these air pipes 7 are flattened somewhat as shown at 8 in Figs. 2 and 5, forming end portions which are of oval shape in cross section and the adjacent ends 9 of these pipes 7 are beveled as at 10 and arranged in overlapping relation, or side by side within the large conduit 6 which extends across the smoke flue 5 of the fireplace, with its end portions extended laterally of the fireplace and opening through the end walls of the fireplace to provide outlets for the air through grills 11 mounted over the outlet ends of the conduit 6. To the ends of the air pipes 7 are connected vertical air conduits 12 which lead downwardly at each end of the fireplace for connection with blowers 13 located within suitable chambers 14 in the end walls of the fireplace. A suitable motor 15 is provided within each chamber 14 for driving the blowers 13, and each of these chambers 14 is open through the end wall of the fireplace to provide air inlets adjacent the floor level, these air inlets being covered each by a grill 16.

The air conduits 12 which lead from the blowers upwardly and are connected at their upper ends to the downturned ends of the air pipes 7, are connected at their lower ends to the outlets of the blowers and are preferably constructed as shown in Fig. 7, they being more or less flexible and having a comparatively thick wall which is adapted to dissipate the vibrations and sounds set up by the motors 15 and blowers 13. The conduit pipes 12 may be of any suitable form of construction but as shown in Fig. 7 they each comprise a comparatively thick wall 17 of suitable fibrous or other material which is supported within, by an inner supporting wall 18, such as

screen wire or other suitable flexible material so that vibrations set up by the running of the blowers and motors, will not be transmitted upwardly to the pipes 7 and the noise of such running will be more or less deadened.

Suitable leading-in electrical conduits indicated at 19 are embedded within the fireplace wall for conducting current to the motors 15 and within this electrical conduit is located a suitable switch 20 in each end wall of the fireplace adjacent to and just above the grills 16 where they may be conveniently operated for turning on the current to drive the motors and thus operate the blowers 13 to draw in air through the grill 16 adjacent the room floor and force it upwardly through the conduits 12 into the ends of the two pipes or conduits 7 from which it will be discharged through the contracted ends 9 of these pipes and directed in opposite directions toward the open or discharge ends of the conduit 6 and out through the grills 11 at a level near the upper end of the fireplace and at a considerable distance above the floor level.

Therefore when these blowers are operating, the blower at one end of the fireplace will draw in air from adjacent the floor and force it up through the conduit 12 into one end of the pipe 7, discharge it under pressure from the discharge end of this pipe and toward the opposite end of the fireplace, the air being heated as it passes through the pipe 7 into the conduit 6 and will then be forced out through the outlet end of said conduit 6 at the end of the fireplace opposite that in which the inlet is located. This conduit 6 extending across the fireplace flue 5 and from end to end of the fireplace in a horizontal plane, is directly contacted by the products of combustion from the fireplace passing through the flue 5 and the conduit 6 is much greater in diameter than the diameter of either of the pipes 7 to provide for expansion of the air within said conduit 6 as it issues from the overlapped ends 9 of the pipes 7. The air thus forced through the pipes 7 from the blowers at opposite ends of the fireplace, is thus directed toward opposite ends of the conduit 6 so that the air entering at one end of the fireplace is discharged at the opposite end and at a higher level than the intake. A circulation of air is thus set up within the room, the air being drawn from adjacent the floor level, circulates across the fireplace above the burning fuel where it is heated thereby and then discharged into the room at the opposite end of the fireplace and at a higher level so that it will heat the upper part of the room, circulate into the remote corners of the room and be returned along the floor into the inlets 16.

As shown particularly in Fig. 5, the conduit 6 is elevated transversely in a vertical direction, thus providing increased space between the upper and lower walls of the conduit 6 and the pipes 7 and within this space below the pipes 7, water may be placed to add moisture to the air ejected from the ends of said conduit, the bottom wall of the ends of this conduit 6 being inclined upwardly so that the water will be retained within the conduit at its lower side, the conduit thus forming a water pan to hold water which will be heated sufficiently to add moisture to the air ejected from the ends of the conduit.

In installing the present invention within a small fireplace, but one blower and motor may be employed and but one pipe 7 which will open into the conduit 6 and discharge the air at the opposite end of the fireplace. Obviously other

changes may be made in the particular construction and arrangement of parts, within the scope of the present invention, without departing from the spirit thereof and such changes are contemplated.

Having thus fully described my invention what I claim is:

1. A fireplace having an open front fire chamber and a flue leading therefrom, and including a tubular member mounted within the walls of the fireplace and extending transversely across said flue and arranged to discharge heated air through an opening in an end wall of the fireplace, a conduit extending into said tubular member and arranged to discharge air toward said opening and extending downwardly within an end wall of the fireplace to an inlet opening in said end adjacent the floor level and at the end of the fireplace opposite that through which the transversely disposed tubular member discharges.

2. In a fireplace including a fire chamber opening through the front of the fireplace and having a flue for the products of combustion leading upwardly therefrom, a tubular member supported within the end walls of the fireplace and extending horizontally across the fireplace and across said flue, said tubular member opening through an end wall of the fireplace, an air conduit opening into said tubular member and extending downwardly at an end of the fireplace opposite that through which the tubular member opens and operative to draw air through an inlet opening adjacent the lower end of said conduit and adjacent the room floor, and means within the end wall of the fireplace for drawing air into the air inlet opening and forcing it into said conduit and into said tubular member extending across the fireplace and across the flue leading from the fire chamber of the fireplace.

3. In a fireplace having a fire chamber opening through the forward side of the fireplace, and a flue leading from said chamber upwardly for conducting away products of combustion; a tubular member mounted within the walls of the fireplace above said fire chamber and extending from end to end of the fireplace and opening through the end walls thereof, means within the end walls of the fireplace adjacent the floor level for drawing in air, and tubes for conducting the air from said means upwardly at each end of the fireplace and into said transverse tubular member for discharge through the open ends thereof.

4. In combination with a fireplace having a fire chamber opening through the front wall of the fireplace and provided with an upwardly extending flue for the discharge of products of combustion, of a tubular member extending transversely across said flue from end to end of said fireplace and opening at its ends through the end walls thereof, a chamber within each end wall of the fireplace adjacent the floor level and having an air inlet, and an air conduit extending upwardly from each chamber and opening into said horizontally disposed tubular member for conducting air from said air inlets in each end wall of the fireplace and upwardly into said tubular member and across said flue and out through the ends of said tubular member at the ends of said fireplace.

5. In a fireplace having a fire chamber opening through the front wall of said fireplace and a flue extending upwardly from said chamber for conducting away products of combustion, of a horizontally disposed tubular member extending across the fireplace from end to end thereof and

across the flue, the ends of said tubular member opening through the end walls of the fireplace, a chamber in each end wall of the fireplace adjacent the floor level and each having an air inlet adjacent the floor level, means within each chamber for drawing in air through the air inlet thereof and forcing the same upwardly into said tubular member, and tubes within said tubular member extending longitudinally thereof and into which the air is forced, said tubes having overlapping adjacent ends to discharge the air therefrom in opposite directions through opposite ends of said tubular member.

6. In a fireplace having a fire chamber opening through the front wall of the fireplace and a flue extending upwardly from the fire chamber to conduct away products of combustion; a tubular member mounted within the structure of the fireplace and extending in a horizontal direction across said flue and above said fire chamber with its ends opening through the end walls of the fireplace, blowers one located within each end wall of the fireplace adjacent the floor level for drawing in air through air inlets at the ends of said fireplace, an air conduit leading upwardly from each blower, a tube connected to each of said air conduits and extending into said tubular member and longitudinally thereof with the adjacent ends of said tubes overlapping and directed toward opposite ends of said tubular member for discharging air into said tubular member and toward the opposite open ends thereof, said portions of said tubes within said tubular member being of oval form in cross section with their adjacent overlapped end portions extending side by side within said tubular member.

7. In a fireplace having a fire chamber open-

ing through the front of said fireplace and having a flue extending upwardly from said fire chamber, of a tubular member mounted within the structure of said fireplace open through the end walls of the fireplace, grills covering the open ends of said tubular member and secured to the end walls of the fireplace, a chamber within each end wall of the fireplace and having an air inlet opening through said end wall, said air inlet openings being covered by grills attached to the end walls of the fireplace adjacent the floor level, a blower within each chamber, a motor within each chamber for driving the blowers, a tubular member attached at its lower end to the discharge end of said blower and extending upwardly within the end walls of the fireplace to adjacent said transverse tubular member, said tubular members the lower ends of which are connected to said blowers being flexible to effect the deadening of vibrations and sound of the blower and motor, and tubes extending longitudinally within the horizontally disposed tubular member and connected to the upper ends of said flexible tubes with their adjacent ends in overlapping relation to discharge air therefrom longitudinally of the tubular member in opposite directions towards opposite ends thereof.

8. A fireplace as characterized in claim 1, and wherein the tubular member is elongated transversely in a vertical direction to provide a space within its lower side below the conduit extending into the tube, to provide a water space within the tube at its lower side to retain water to be evaporated by heat and add moisture to air ejected from the end of the tube.

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