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COMBUSTION DEVICE FOR FURNACES

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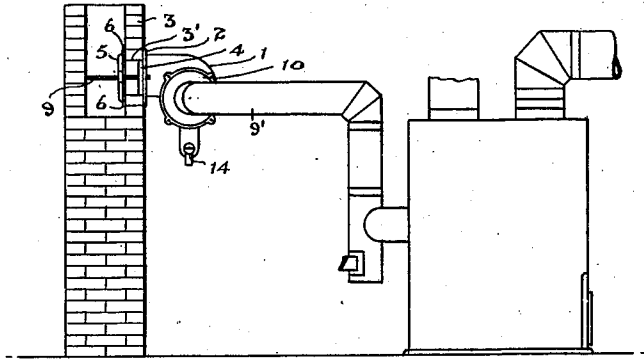


Fig. 1.

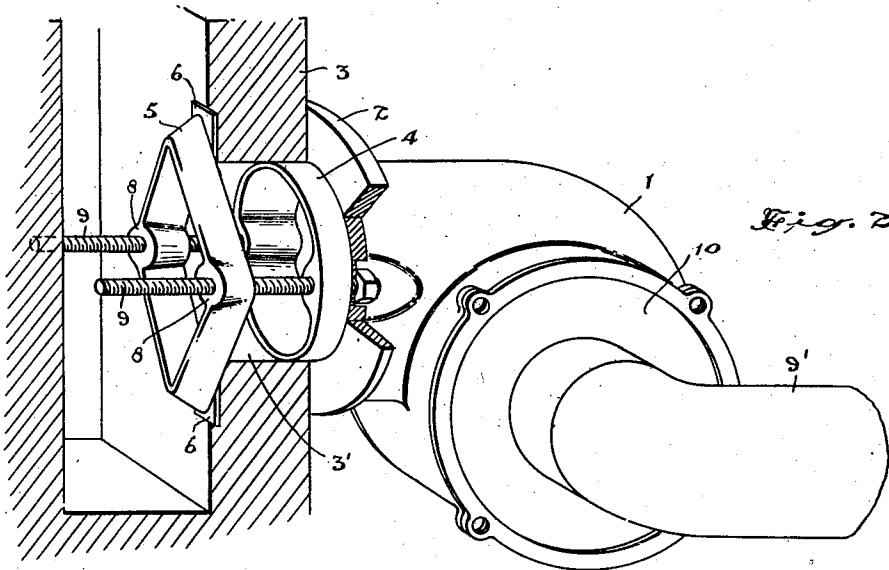


Fig. 2.

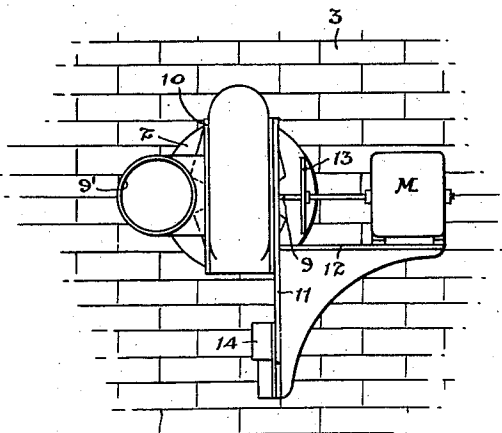


Fig. 3.

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COMBUSTION DEVICE FOR FURNACES

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The principal objects of the invention are to provide a means for regulating the temperature of dwellings which will increase the natural draught of the furnace flue to effect the acceleration of combustion of fuel in the furnace as required by the actual temperature conditions, and to provide a device which may be installed without interfering with the furnace structure and which will eliminate disagreeable conditions caused through the escape of coal gas and dust from the furnace.

The principal feature of the invention consists in the application of a blower device in the flue leading from the furnace whereby air is drawn into and through the furnace accelerating the draught and drawing dust and products of combustion from the furnace and delivering them into an external flue, the motor for operating the blower being directly supported thereby and thermally insulated therefrom and thermally operated means being provided to control said motor.

In the accompanying drawings, Figure 1 is an elevational view illustrating the application of this invention to a hot air furnace.

Figure 2 is an enlarged perspective detail showing the manner of attaching the blower to the flue.

Figure 3 is a small elevational view showing the arrangement of the motor for driving the blower.

The problem of house heating has received the attention of heating engineers to the end that it has been well established that by effecting an increase in the draught or volume of air passing through the furnace a greater heating efficiency can be obtained and numerous devices have been applied to furnaces for forcing air into and through the furnace.

The present invention consists in applying a blower to the chimney flue and connecting the furnace flue to the suction side of the blower.

Many different constructions of blowers are available for this purpose. In the illustration of the present invention herein shown, the centrifugal blower 1 is provided with a flange 2 at its discharge end which is adapted to fit snugly against the face of the chimney wall 3 and the flange 4 extends into the bot-

tom end of the flue opening, it being fitted snugly into the brick work and preferably cemented in place.

A metal frame 5 which is preferably of a rhomboid shape and provided with flat plate surfaces 6 at the end is inserted through the flue opening 3' and fits against the inner wall of the vertical flue.

Bosses 8 are formed in this frame at the opposite wide angles of the rhomboid and these are threaded to receive the threaded studs 9 which are here shown extending therethrough to engage the outer wall of the vertical flue so that the frame may be clamped in position inside the flue before the blower is placed in position.

The furnace flue 9' is connected to the cover plate 10 on the suction side of the blower so that the products of combustion from the furnace are drawn into the blower and expelled through the outlet directly into the flue opening 3'.

A plate 11 is secured to the blower casing on the side opposite the plate 10 and extends downwardly below the casing and is formed with a horizontal bracket extension 12.

A small electric motor M is mounted on the bracket 12 and the shaft thereof extends through an opening in the plate 11 and supports the impeller of the blower which is mounted upon its inner end. It is preferable that the impeller shaft be free of the blower casing as the heat of the casing prohibits the maintenance of a bearing therein and the minimum of heat is conducted to the shaft. Further, the opening surrounding the shaft permits the inflow of a current of cool air around the shaft which effectively cools it.

A metal disc 13 is mounted on the shaft outside the casing and forms a deflector for heat radiated from the casing and also forms a direct heat exchange medium for dissipating the heat imparted to the impeller and inner end of the shaft so that the motor and motor bearings will be free from a detrimental temperature. Further this disc being arranged close to the casing directs a stratum of air between the disc and the casing, the air being drawn inwardly to the opening surrounding

the shaft by the action of the impeller of the blower.

A thermostatic controller 14 is mounted on the lower extending end of the plate 11 below the bracket 12 and is electrically connected with the motor circuit. This thermostat which may be of any ordinary moderate temperature type, such as those using a bi-metallic strip is affected by the direct conduction of heat from the fan casing which is moderated by the temperature of the surrounding air and it can be set to operate the motor within a closely regulated limit.

It will be seen that with the blower attached directly to the masonry of the chimney it will be supported very rigidly so that vibration will be reduced to the minimum and such an arrangement renders its application extremely simple and inexpensive and the whole forms a compact unit.

When a blower is applied to the flue side of the furnace, air is drawn into the furnace through the ash-pit and the fire door openings so that not only is the combustion of the fuel accelerated, but there will be a thorough admixture of air with the gases produced in combustion and these will be burned and the heat produced thereby will be conserved. Further, the suction flow of air through the furnace prevents the escape of gases through insecure joints, either in the furnace or flue structure and the fine ash or dust arising from the fire in shaking is drawn out of the furnace and discharged into the flue. Furthermore back-firing in the furnace will be practically eliminated.

What I claim as my invention is:

1. In a device for accelerating the draught in furnaces, the combination with a furnace and permanent flue therefor having an opening therein for the entrance of combustion gases, of a centrifugal blower having its casing directly supported from the permanent flue structure with its discharge directly connected with said flue opening, an unobstructed flue leading from the furnace directly connected with the intake of said blower casing, and a motor for operating said blower wholly supported from the casing thereof.

2. In a device for accelerating the draught in furnaces, the combination with a furnace and a permanent flue therefor having an opening therein for the entrance of combustion gases, of a centrifugal blower having a tubular extension from its discharge formed to enter the opening to said flue and form a direct connection with said flue, means extending within the flue for clamping the tubular extension of said blower in said flue to rigidly support the blower, and an unobstructed furnace flue directly connected with the intake of said blower.

3. A device for accelerating the draught in furnaces, comprising the combination with

a flue having an opening leading thereto, of a blower having the casing formed with a lateral flange surrounding the discharge and an extension to enter the flue opening, an open metal frame adapted to be inserted through the flue opening and to span said opening, bolts extending between said frame and the flange of said blower and rigidly clamping same to the flue wall, and a furnace flue connected to the intake side of the blower.

4. In a device for accelerating the draft in furnaces, the combination with a furnace and permanent flue therefor having an opening therein for the entrance of combustion gases, of a centrifugal blower having its casing directly supported from the permanent flue structure with its discharge directly connected with said flue opening, an unobstructed flue leading from the furnace and directly connected with the intake of said blower casing, a motor for operating said blower wholly supported from the casing thereof, and a thermostat supported upon the blower casing thermally influenced by the heat of said casing for controlling the operation of the blower.

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