Jan. 9, 1940. J. E. WHETSTINE 2,186,354

DRAFT CONTROL MEANS

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Fig. 1

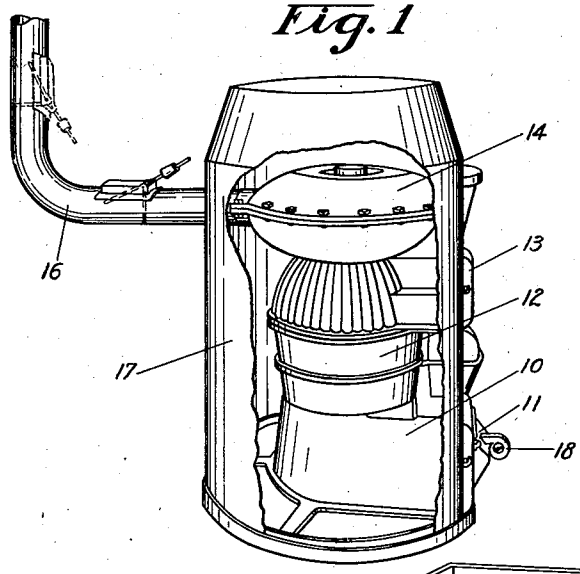


Fig. 2

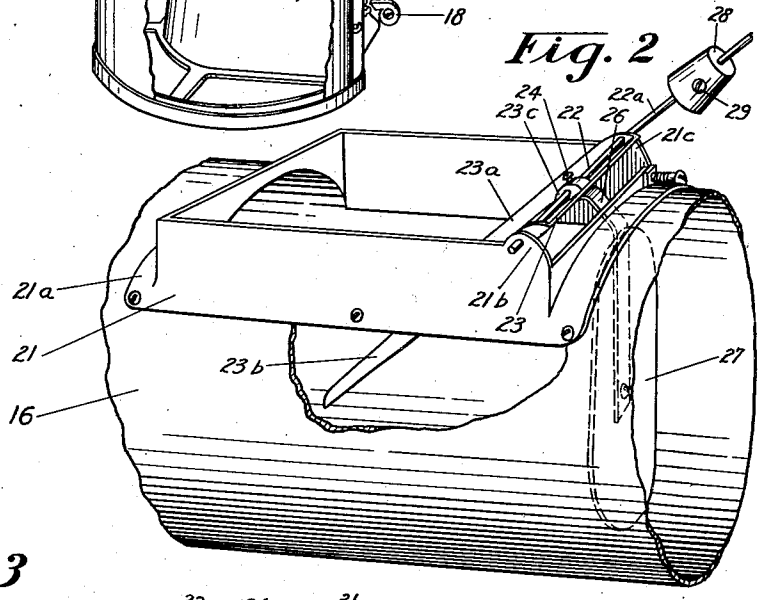
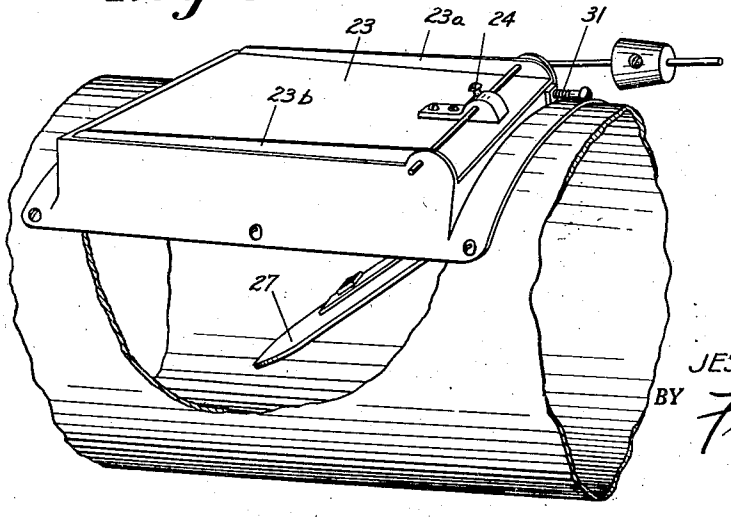


Fig. 3



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DRAFT CONTROL MEANS

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2 Claims. (Cl. 126—293)

This invention relates to heating equipment and has particular relation to means for controlling the draft in furnaces and the like.

It has been found, in furnaces and the like, that substantially automatic operation may be secured by filling the furnace with coal and providing a blower for controlling the draft to the furnace. This blower is preferably controlled by a room thermostat and, when the thermostat calls for heat, the blower is energized to drive air into the ash pit, which air passes up through the fire and out through the stack to speed up the combustion of the coal. When the room thermostat is satisfied; that is when the temperature in the room has reached a predetermined temperature, the thermostat opens a circuit to a blower motor, and the draft through the furnace is cut off.

I have found that this system is not entirely satisfactory for the reason that natural convection currents carry air through the furnace and up the stack when the blower is not in operation, thus carrying the heat out the stack. It is possible to provide a solenoid or motor controlled stack damper for opening a check opening into the stack, but such devices are relatively expensive. I have discovered that it is possible to utilize the draft in the stack itself for controlling the check draft opening, and furthermore that this operating means located in the stack may be employed to substantially close off the stack when there is no draft in the stack to conserve the heat in the furnace.

It is, therefore, a general object of my invention to provide a system of controlling the drafts and check drafts in a furnace.

It is another object of my invention to provide means for controlling the check draft in a furnace in respect to the forced draft created by a blower.

Other and further features of my invention will be more apparent to those skilled in the art upon a consideration of the accompanying drawing and following specifications, wherein is disclosed several exemplary embodiments of the invention, with the understanding, however, that such changes may be made therein as fall within the scope of the appended claims without departing from the spirit of the invention.

In said drawing:

Figure 1 is a view in perspective illustrating a furnace, a blower, and a stack control device constructed according to my invention. A portion of the jacket of the furnace has been removed to show the interior.

Figure 2 is a view in perspective of a preferred embodiment of my invention as it appears in action. The check draft is in the position it occupies when the draft created by the blower is closed off, and

Figure 3 is a view in perspective of the device shown in Figures 1 and 2 as it appears when the blower is in operation or when there is a draft through the furnace.

Referring now to the drawing:

There is here shown a conventional furnace consisting of the ash pit 10 with its ash door 11, the fire pot 12 with the feeding door 13, the heater dome 14, the stack 16, and the furnace jacket 17. A conventional blower is illustrated at 18.

A device constructed according to a preferred embodiment of my invention includes the frame member 21 substantially rectangular in plan and having a curved flange 21*a* adapted to fit over the rounded outer surface of the stack 16. At one end of the frame 21 I have provided ears 21*b* and 21*c*, and these ears receive a cross shaft 22 which is rotatably mounted in the ears. The frame member 21 may be of any suitable material, as for instance a casting of cast iron.

A check draft plate 23 is secured on the shaft 22 by means of openings through the flanges 23*a* and 23*b*, and by means of a boss 23*c*. The boss is provided with a set-screw 24, by which it is engaged to the cross shaft 22. A strap of metal, as illustrated at 26, is secured to the back face of the check draft plate 23, and extends at roughly an angle of 45 degrees with reference to the plate 23, the angle being so chosen that when the plate 23 is in the open position shown in Figure 2, a disc-like damper 27 is located at right angles to the pipe 16.

The shaft 22 is bent at right angles outside the frame 21, as indicated at 22*a*, and a counterweight 28 is drilled to be received on the bent leg of the shaft and is secured thereto by means of the set-screw 29. In use the counter-weight is so located on the shaft 22 and the shaft so positioned with reference to the assembly consisting of plates 23 and 27, that normally the damper 27 will be positioned at right angles to the pipe 16 and the draft damper 23 opened to permit air to enter directly into the pipe 16. When the blower 18 is energized the draft created in the stack 16 by means of the blower will blow the damper 27 to the position illustrated in Figure 3 to close the check draft door 23, to thus prevent the entry of air from the basement into the stack.

In operation the stack is normally closed or substantially closed by means of the damper 27 and air from the basement enters directly into the stack, thus conserving the heat within the furnace. When the blower is energized and it is necessary to use the stack for carrying off the gases produced by combustion, the forced draft created by the blower will drive the damper 27 to the open position to close the check draft door 23. As soon as the blower 18 is de-energized, the damper 27 will tend to return to its original position. Of course it may not return entirely to its original position at once, because of the draft set up in the stack, but the effect of this damper is to close off the furnace to shut down the draft thereto and to permit the basement air to enter the stack. I preferably provide a set-screw 31 for limiting the movement of the door 23 to its opened position.

The construction of the device is such that it may be used either in the horizontal position shown in full line in Figure 1, in the vertical position illustrated in dotted lines in Figure 1, or in any angle between vertical and horizontal. All that is necessary is slght adjustment of the counter-weight 28 and the arm 22*a* of the shaft 22.

Although I have described a specific embodiment of my invention, it is apparent that modifications may be made by those skilled in the art. The device may be adapted for use with large boilers and for use with oil or gas burners or for use with any devices in utilizing blowers. It is apparent, therefore, that modifications may be made by those skilled in the art without departing from the spirit and scope of my invention as set forth in the appended claims.

I claim as my invention:

1. In a draft control means, a rectangular frame, a cross shaft pivotally engaged within the frame, the frame having a flange for mounting it on the stack of a furnace, a check draft door engaged on the cross shaft, a strap engaged on the check draft door, a damper engaged on the strap, and the cross shaft being bent at right angles thereto to afford means for mounting a counter-weight thereon, and a counter-weight mounted on the bent portion of the cross shaft.

2. In a draft regulating means for use in a stack in conjunction with a furnace and a coal blower, a check draft door, a damper plate fixedly attached at an angle thereto, the check draft door arranged for pivotal movement about a laterally extending shaft, and a weighted means for counter-balancing the weight of the check draft door and damper plate to hold said damper plate in a closed position, said damper adapted to be opened and the check draft door closed by the pressure of gases within the furnace when the blower is in operation, said check draft door further adapted to be partially opened by an excess of draft within the stack to thereby partially close the damper.

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