

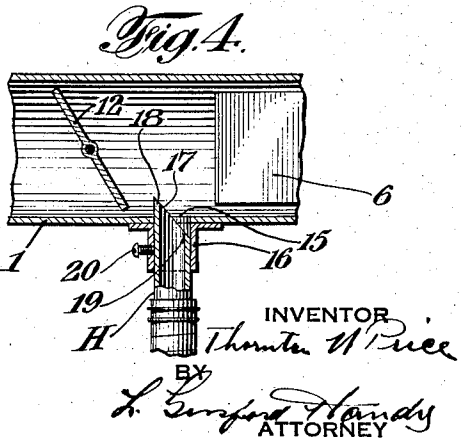
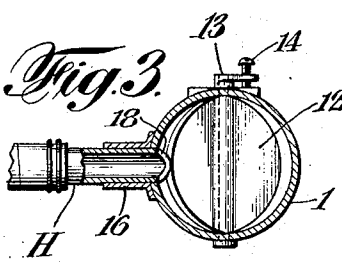
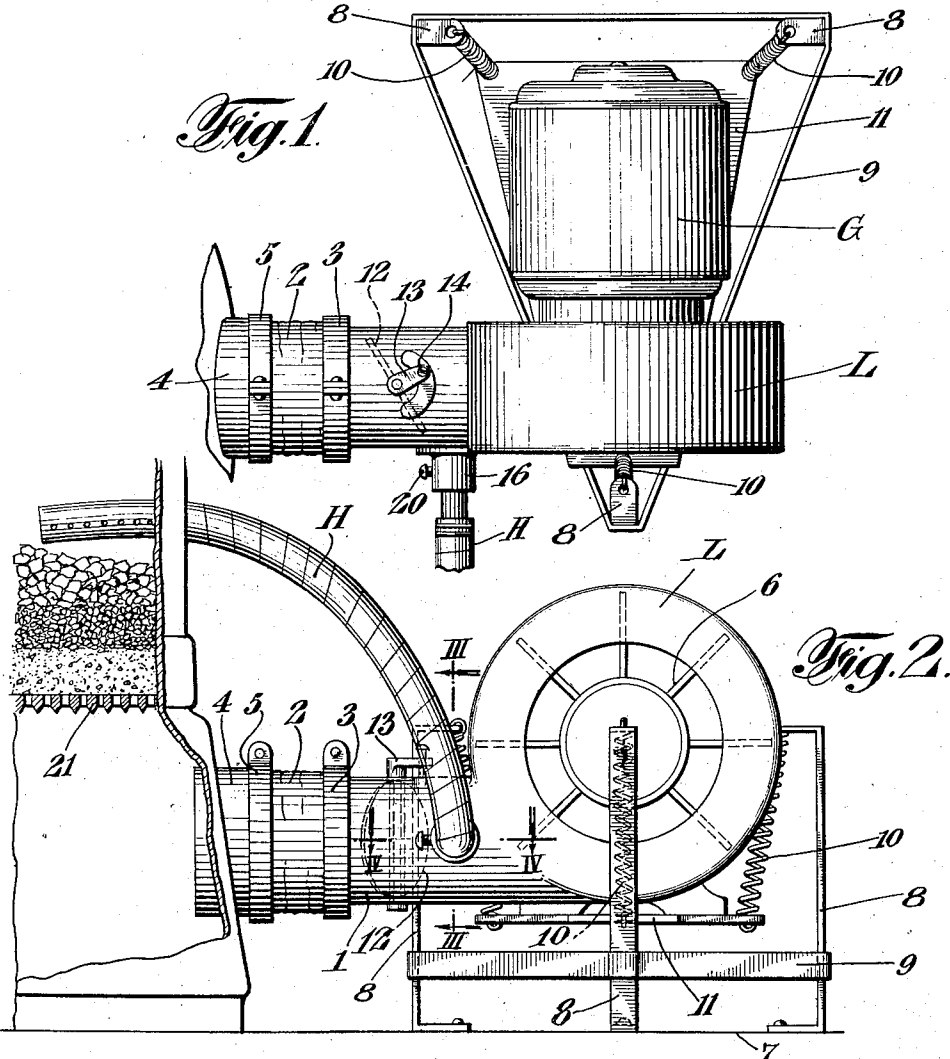
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T. W. PRICE

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FURNACE CONTROLLING DEVICE

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UNITED STATES PATENT OFFICE

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FURNACE-CONTROLLING DEVICE

Application filed November 24, 1928. Serial No. 321,626.

This invention relates to a furnace controlling device, and an object of the invention is to provide a simple and efficient device for supplying forced draft to the furnace and for at the same time supplying air in adjusted proportional quantity to the upper portion of the fire pot of the furnace.

A further and more detailed object is to provide a blower device for feeding air through a pipe into the ash pit of the furnace, to provide a by-pass from said pipe by which a portion of the air may be fed to the upper part of the fire pot of the furnace, and to provide suitable valve mechanism by which to readily control the passage of air through said pipe and said by-pass.

A further and detailed object is to so arrange the valve mechanism that the shutting off of the passage of air through the pipe to the ash pit will automatically result in proportionally altering the amount of air sent through the by-pass to the upper portion of the fire pot.

A further object is to provide a blower device, including an electric motor, and to mount said device and connect it with the furnace, so that the device, including the motor, will have a limited free movement with respect to the furnace sufficient to absorb or dissipate the greater portion of the sound and vibration incident to the operation of the motor.

Other objects and aims of the invention, more or less specific than those referred to above, will be in part obvious and in part pointed out in the course of the following description of the elements, combinations, arrangements of parts and applications of principles constituting the invention; and the scope of protection contemplated will be indicated in the appended claims.

In the accompanying drawings which are to be taken as a part of this specification, and in which I have shown merely a preferred form of embodiment of the invention:—

Fig. 1 is a top plan view of a furnace controlling device constructed in accordance with this invention.

Fig. 2 is a front elevational view of the

device seen in Fig. 1 and showing the same connected with a furnace.

Fig. 3 is a transverse detail sectional view taken upon the plane of line III—III of Fig. 2, and

Fig. 4 is a horizontal sectional view taken upon the plane of line IV—IV of Fig. 2.

Referring to the drawings for describing in detail the structure therein illustrated, the reference character L indicates a blower casing having the discharge nozzle or pipe 1 extending eccentrically therefrom toward the ash pit of the furnace. The end portion of this pipe adjacent the furnace terminates short of the furnace but is connected therewith by means of a flexible hose section as 2, said hose section being held to the end of the pipe by any appropriate means, as for instance by the use of a clamp collar 3. A metallic sleeve member 4 is fitted through an appropriate opening in the wall of the furnace ash pit and a second clamp collar as 5 serves to connect the flexible section 2 with said sleeve.

The blower casing L is formed integrally with or rigidly connected to the housing of an electric motor G, the rotor of the motor having fixed thereto a fan element as 6 rotatable within the casing L in a well understood manner.

The motor, and the casing L etc., as described, may be supported upon the floor 7 in any appropriate manner, but it is a feature of this invention to so mount said parts that the vibrations and "hum" of the motor will not be imparted either to the floor or to the furnace. A convenient and very efficient method of mounting is illustrated herein consisting of a plurality of spring standards as 8—8 connected together by a frame 9 and having coil tension springs 10 suspended from their upper ends, with a motor platform 11 carried at the lower ends of said coil springs collectively. The motor G rests upon the platform 11 and is freely movable therewith in all directions. The vibratory motion of the motor is transmitted first to the lower ends of the springs 10 and through said springs to the upper ends of the spring stand-

ards which effectually complete the absorption of both sound and motion.

The springs 10 converge downwardly so that the platform 11 and its motor G are yieldingly centered to a sufficient extent so that the location of the motor is definitely determined within desirable limits.

The flexible hose connection 2 is of a character to complete a closed passage between the blower and the ash pit while at the same time permitting substantially unobstructed vibratory movement of the motor and blower without transmitting the movement to the furnace.

Within the pipe 1 is arranged a valve or damper member 12 having an operating handle 13 extending exteriorly of the pipe by which the damper may be readily opened and closed at will. A clamp screw, or other appropriate means, as 14 may be carried by the handle for engaging against the pipe to hold the valve in any position to which it is moved.

By means of this valve the amount of air driven by the fan 6 into the ash pit of the furnace may be controlled at all times irrespective of the speed of the fan.

At a suitable point in the wall of the pipe 1 there is provided an opening 15. A hollow extension 16 is arranged exteriorly of the pipe in continuation of this opening, and into this extension is fitted one end of a pipe H. The pipe H is freely longitudinally movable in said extension so that it may be adjusted to dispose its inner end projecting any desired distance into the pipe 1. The inner end is beveled off as at 17 said bevel being arranged so that the toe as 18 thereof is further from the fan 6 than is the heel 19 of said bevel.

Any appropriate means may be employed for retaining the pipe H in adjusted position, but for this purpose the drawing illustrates merely a clamp screw as 20 threaded through the extension 16 for clamping against the pipe H as will be readily understood. Upon release of the screw 20 the pipe H may be adjusted into or out of the pipe 1, tightening of the screw sufficing to maintain the adjustment.

The pipe H is flexible, being preferably formed of ordinary commercial flexible metallic tubing and its upper end extends through an appropriate opening in the furnace wall at a point above the furnace grate 21 and into the upper portion of the fire pot. The portion of the pipe H which projects into the extension 16 of pipe 1 may if desired consist of a relatively stiff short section of the metallic tubing fixed in any appropriate manner to the lower end of the flexible portion of the pipe.

The amount of air driven through the pipe H during the operation of the device will depend upon two elements, first, the degree of closure of valve 12, and, second, the de-

gree to which the toe 18 of the pipe H is projected into the pipe 1. The further the toe 18 projects the more directly it will stand in the main line of movement of the air blast from the fan 6 and the greater will be the consequent divergence of air into the pipe H. Also, the more nearly closed the valve 12 stands the greater will be the pressure of air between the valve and the fan, and since the pipe H is positioned in this region of pressure the greater will be the amount of air driven into said pipe H.

It will be seen that by these means the amount of air moving to the upper portion of the fire pot will vary in inverse proportion to the amount moving into the ash pit. The cutting down of the latter will build up the former, and vice versa. At the same time the amount of air moving through the pipe H may be further modified at will by the simple adjustment of moving it more or less into the pipe 1 as above described.

It may be here mentioned that adjustment of the valve mechanism described, that is of the valve 12 and of the position of the toe of the pipe H, is not ordinarily intended to be altered except in adjusting the furnace control to a given furnace. That is to say that these valve devices are intended primarily for adjustment only when a furnace controlling outfit is being initially installed upon a given furnace. It is practical to use a given size of outfit upon furnaces of different sizes and in the presence of chimney and other draft restrictions differing widely from each other. Once the valve mechanism is adjusted to a given furnace it is rarely necessary to subsequently disturb the adjustment although it will be understood of course that the adjustment may be modified to any desired extent at any time.

It is further to be noted that by utilizing a flexible hose or tube for the pipe H said hose or tube provides the desired by-pass for air into the upper portion of the fire pot without interfering with the free vibratory movement of the motor and its related parts and without transmitting said vibratory movements, or the "hum" of the motor, to the furnace.

The purpose of the by-pass pipe H is to feed a certain measured amount of air into the upper portion of the fire pot, that is into the open space above the bed of coals on the grate 21, the amount of air thus fed being in a certain predetermined proportion with respect to the amount driven into the ash pit, beneath the grate 21, through the pipe 1. The amount of air fed into the upper portion of the fire pot is intended to be just sufficient to supply the right amount of oxygen to support complete combustion of the gases rising from the burning coals. At the same time it must not be so great as to in any material way interfere with the draft or blast moving up-

wardly through the coals from the pipe 1. The valve mechanism here described has been found to be highly efficient in dividing the supply from the fan 6 in proper proportions to the pipes 1 and H. It is very simple to manipulate, and entirely practical to manufacture.

As many changes could be made in this construction without departing from the scope of the invention as defined in the following claims, it is intended that all matter contained in the above description, or shown in the accompanying drawings, shall be interpreted as illustrative only and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a furnace controlling device, in combination, a furnace, a blower, a motor for driving said blower, a pipe extending from the blower adapted to be connected with one part of said furnace, said pipe having a lateral opening through the wall thereof, a second pipe extending through said opening having its inner end beveled off to face in the general direction of the blower, means whereby said second pipe is adjustable to move said inner end to a greater or less distance into the first pipe, said second pipe being adapted to extend into connection with a different part of said furnace, and a manually adjustable valve within the first pipe beyond but in close proximity to the inwardly projecting end of the second pipe.

2. The combination, with a furnace having a grate, a combustion chamber above the grate and an ash pit below the grate, of a motor, a blower comprising a fan driven by said motor and a fan housing rigid with the motor having an air discharge pipe extending rigidly therefrom and supported thereby, means completing a closed air conduit from said air discharge pipe into the ash pit of the furnace, means forming a second air conduit between the blower and the combustion chamber of the furnace being connected in supported relation upon the blower and the furnace, both of said air conduits forming means being of a resilient character in order to decrease the inherent tendency of the motor and blower while in action to transmit vibration to the furnace and connected parts, and a carrying device by which the motor and the parts supported thereby are mounted resiliently.

3. The combination, with a furnace having a grate, a combustion chamber above the grate and an ash pit below the grate, of a motor, a blower comprising a fan driven by said motor and a fan housing rigid with the motor having an air discharge pipe extending rigidly therefrom and supported thereby, a carrying device adapted to rest upon the floor beside the furnace and having spring

parts by which the motor and the elements rigid therewith are resiliently supported in order to decrease the inherent tendency of the motor and blower while in action to transmit vibration to the furnace and connected parts, a separately formed sleeve mounted upon the furnace at an opening into the ash pit, said sleeve being spaced from the outer end of said discharge pipe, a section of hose connected by its opposite ends to said sleeve and pipe to complete an air conduit between the blower and the ash pit, means forming a second air conduit between the blower and the furnace also comprising a section of hose and having one end connected in supported relation upon the fan housing and having its other end connected in supported relation upon the furnace in communication with the combustion chamber, and both of said sections of hose being readily flexible to thereby further prevent vibration of the motor and blower from reaching the furnace and its connections.

In testimony whereof I affix my signature.
THORNTON W. PRICE.