May 5, 1942. W. E. FIREHAMMER 2,282,125

FURNACE CONTROL

Filed Nov. 20, 1939

Fig. 1.

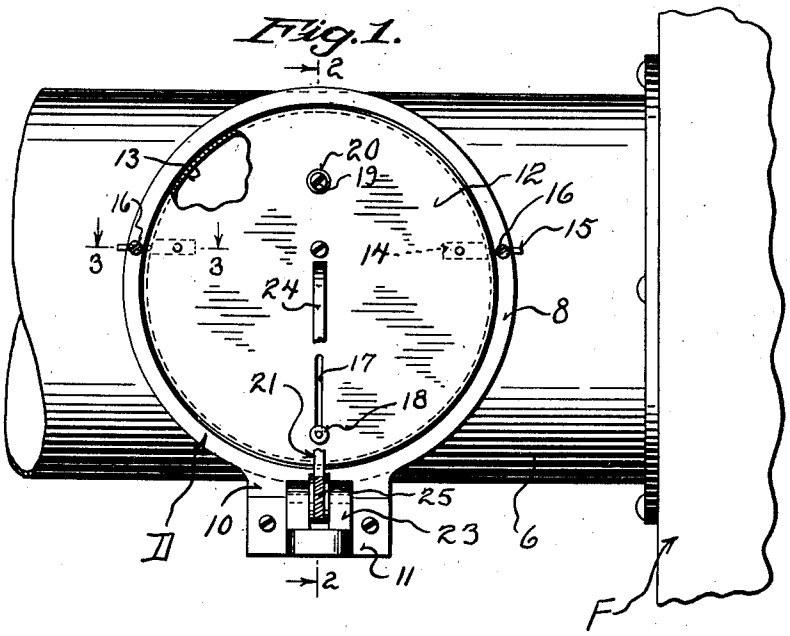


Fig. 2.

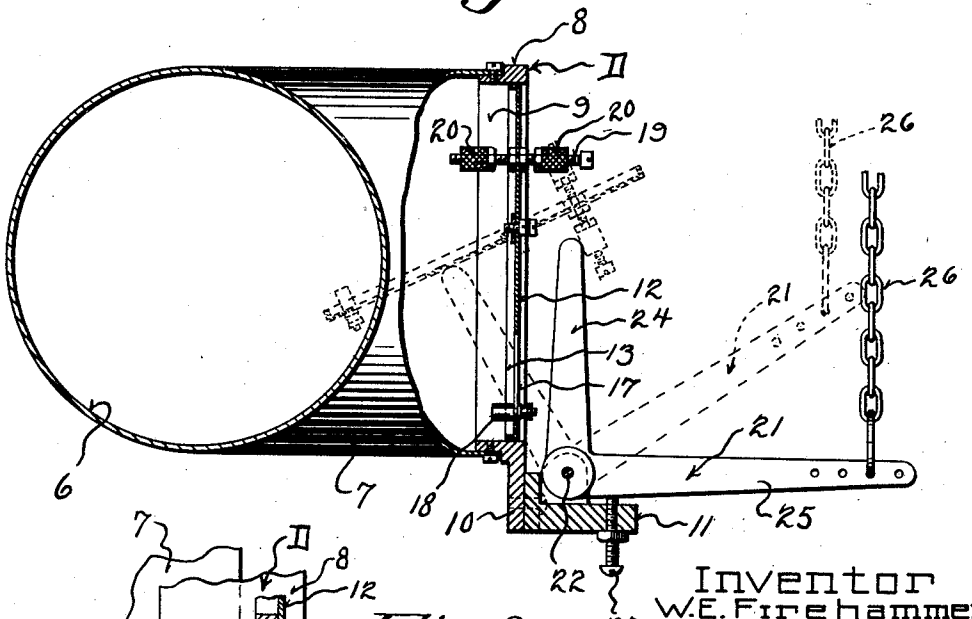
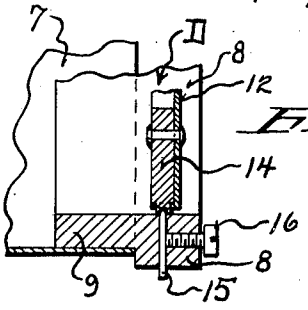


Fig. 3.



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FURNACE CONTROL

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3 Claims. (Cl. 236—45)

This invention appertains to furnace controls of the general type shown in my prior patent, No. 2,179,120, Nov. 7, 1939.

One of the primary objects of my present invention is to provide an efficient means for preventing high stack temperatures, and to save fuel consumption.

Another salient object of my invention is to provide a damper for furnace smoke-pipes, which will automatically control the chimney draft during the time the draft door of the furnace is open, and which can be moved by hand or by any other preferred means to an open position for checking the fire when the draft door of the furnace is moved to a closed position.

A further important object of my invention is to provide a check damper for furnace smoke-pipes embodying a substantially balanced damper gate automatically subjected to barometric or atmospheric draft conditions, and an operating lever normally free of the damper gate and movable for swinging the damper gate to an open position for checking the fire when the furnace heat is to be held.

With these and other objects in view, the invention consists in the novel construction, arrangement, and formation of parts, as will be hereinafter more specifically described, claimed, and illustrated in the accompanying drawing, in which drawing:

Figure 1 is a side elevational view of a smoke-pipe leading from a furnace, showing the improved control incorporated therewith.

Figure 2 is a vertical sectional view through my control, taken on the line 2—2 of Figure 1, looking in the direction of the arrows.

Figure 3 is a horizontal sectional view taken on the line 3—3 of Figure 1, looking in the direction of the arrows.

Referring to the drawing in detail, wherein similar reference characters designate corresponding parts throughout the several views, the letter D generally indicates my improved device incorporated in a smoke-pipe 6. The smoke-pipe 6 leads from a furnace F to a chimney or stack (not shown). Intermediate the ends of the smoke-pipe 6 is arranged a right-angularly disposed air inlet sleeve 7 forming a laterally extending check draft opening.

The improved device D comprises a ringlike frame 8 having a reduced extension 9 fitted within and firmly secured to the air inlet 7. Depending from the ringlike frame 8 is an attaching plate 10 to which is secured a supporting bracket 11, the purpose of which will be later set forth.

The ringlike frame 8 rockably supports the damper gate 12, and the damper gate is preferably formed from sheet metal, having an inturned marginal reinforcing flange 13. Above the horizontal diametric center, the damper gate carries bearing blocks 14, which are engaged by pointed bearing pins 15. These pins are carried by the ring 8, and are firmly held in an adjusted position against displacement by set screws 16. By this arrangement, the damper gate is pivoted above its center and normally tends to close.

In order to facilitate the correct balancing of the damper gate, the damper gate below its center is provided with a vertical slot 17, in which is mounted an adjustable weight 18. This weight is arranged on the inner face of the damper gate. In order to further aid in the correct balancing of the damper gate, the damper gate carries above its horizontal diameter a threaded rod 19, and mounted upon the rod on each side of the damper gate are adjustable weights 20.

By the arrangement so far, the damper gate is free to open and close, and the damper gate will tend to regulate itself during the operation of the furnace, and, hence, the damper gate is opened by changes in barometric or atmospheric pressures.

Means, which is free of the damper gate, is provided for positively opening the damper gate when it is desired to check and hold the fire in the furnace, when the furnace draft door is closed.

This means consists of a bell-crank lever 21, and the lever 21 is rockably mounted at its vertex on a pivot pin 22 carried by a pair of upstanding ears 23. These ears are formed on the supporting bracket 11. The short arm 24 of the lever extends upwardly and is arranged in front of the damper gate and is normally spaced from said damper gate. The long arm 25 of the lever 21 extends forwardly from the damper gate, and a pull chain 26 can be attached thereto at the desired point. As shown, the long arm of the lever is provided with a plurality of openings for selectively receiving the chain 26. Obviously, the chain 26 can be operated manually or in any other preferred way. Likewise, the long arm 25 of the lever can have adjustably mounted thereon a counter-balancing weight (not shown).

Obviously, when it is desired to check the furnace fire, the long arm of the bell-crank lever is moved upwardly, and the short arm 24 thereof will ride into engagement with the damper gate 12 below its pivot point, and will swing open the

damper gate. The damper gate will be held in such open position as long as the bell-crank lever is held raised, as is shown in dotted lines in Figure 2 of the drawing.

In order to limit the downward swinging movement of the long arm of the bell-crank, the supporting bracket 11 carries a screw 27, which can be adjusted toward and away from said long arm.

Changes in details may be made without departing from the spirit or the scope of my invention, but what I claim as new is:

1. In a furnace control, a flue pipe for the furnace having a laterally extending check draft opening, a ringlike frame surrounding said opening, a damper gate rockably mounted eccentrically between its top and bottom in said ringlike frame for free swinging movement, whereby said damper gate is responsive to draft conditions in said flue pipe, and means for positively opening said damper gate, said means including an operating lever rockably mounted on said ring-like frame for engaging said damper gate to open the same and normally disengaged from the damper gate to permit free movement thereof responsive to draft conditions.

2. In a furnace control, a flue pipe for the furnace having a laterally extending check draft opening, a damper gate rockably mounted in said opening above its horizontal diameter for free swinging movement, whereby the damper gate is responsive to draft conditions in said flue pipe, adjustable balancing weights for the damper gate arranged above and below its pivot point, a bell crank lever rockably mounted at its vertex below and in front of said opening including an upstanding short arm and an outwardly extending long arm, said short arm being normally spaced from the damper gate, whereby the damper gate is free to rock under draft conditions in the flue, and a pull chain adjustably connected to the long arm of the lever for rocking said lever to permit positive opening of the damper gate.

3. In a furnace control, a flue pipe for the furnace having a laterally extending check draft opening, a ringlike frame surrounding said opening having a depending plate formed thereon, a damper gate rockably mounted above its horizontal diameter in said ringlike frame, a bracket secured to said plate, a bell crank lever rockably mounted at its vertex on the bracket including a long and a short arm, the short arm being adapted to extend in front of the damper gate and normally spaced therefrom to permit free swinging of said damper gate under draft conditions in the flue pipe, and means for operating the long arm of the bell crank to positively open said damper gate.

WELTON E. FIREHAMMER.