Aug. 22, 1939. C. D. MONTAGUE 2,170,728

AUTOMATIC DRAFT REGULATOR

Filed Aug. 16, 1937 2 Sheets-Sheet 1

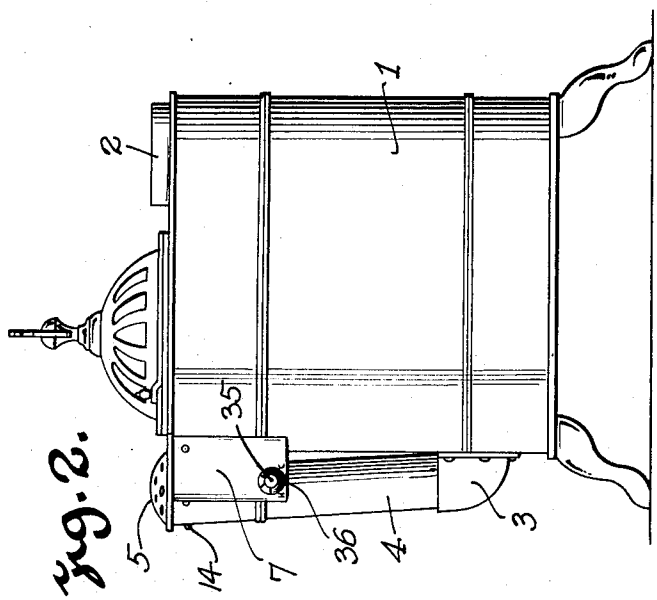


Fig. 2.

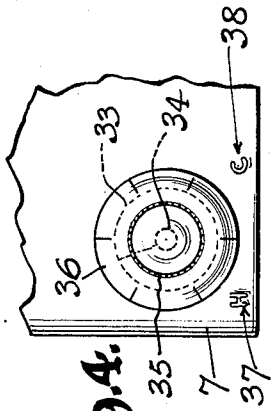


Fig. 4.

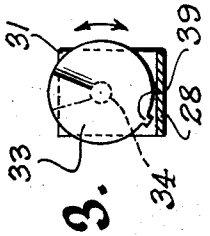


Fig. 3.

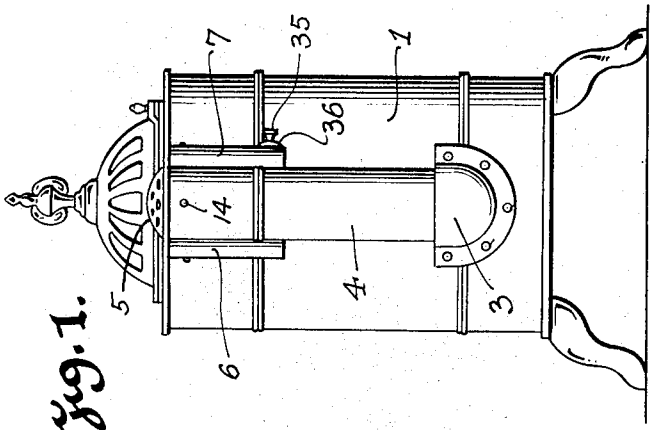


Fig. 1.

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AUTOMATIC DRAFT REGULATOR

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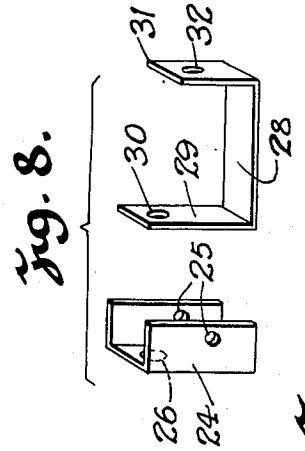


Fig. 8.

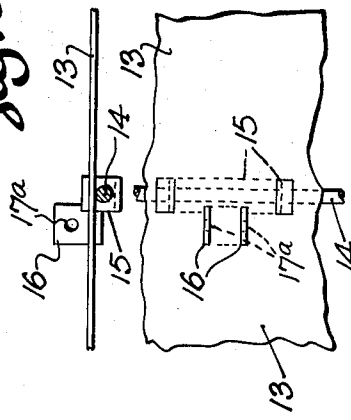


Fig. 9.

Fig. 10.

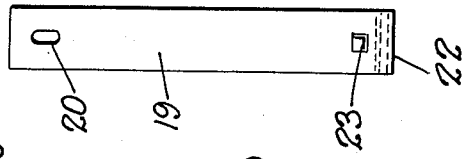


Fig. 7.

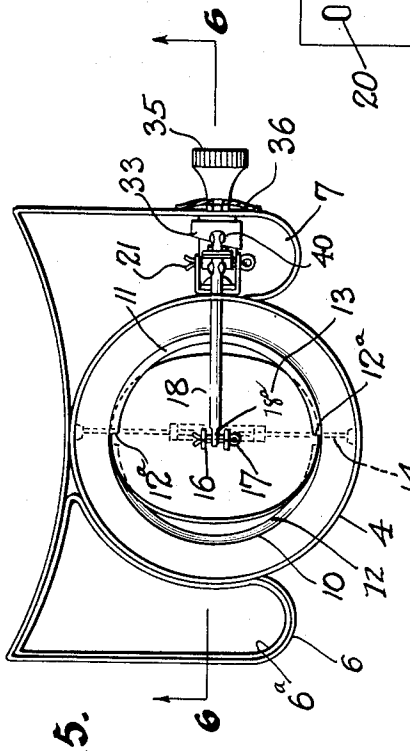


Fig. 5.

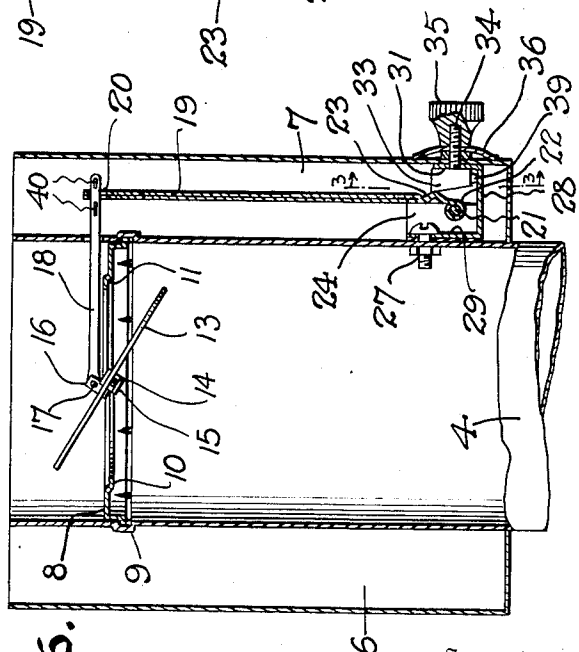


Fig. 6.

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UNITED STATES PATENT OFFICE

2,170,728

AUTOMATIC DRAFT REGULATOR

Charles Delevan Montague, Fredericksburg, Va., assignor to Automatic Draft and Stove Co., Inc., Lynchburg, Va.

Application August 16, 1937, Serial No. 159,420

4 Claims. (Cl. 236—96)

The object of my invention is to provide a novel draft regulator primarily intended for use on a residence wood heater.

Another object of my invention is to provide an automatic heat regulator which will automatically regulate the draft of a heater whereby the desired temperature may at all times be maintained. Another object of my invention would be to employ this draft mechanism in connection with a brooder or hover.

I attain these and other objects of my invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an end elevation of the invention applied to a wood heater;

Fig. 2 is a side elevation of same;

Fig. 3 is a detail plan view of cam 33;

Fig. 4 is a front elevation of the knob 35 and dial 36;

Fig. 5 is a top plan view of the invention applied to a heater;

Fig. 6 is a vertical section on line 6—6 of Fig. 5;

Fig. 7 is a detail plan view of member 19;

Fig. 8 is a detail perspective view of members 24 and 28 detached from the rest of the apparatus;

Fig. 9 is a detail edge elevation of damper 13 and associated parts, and

Fig. 10 is a detail top plan view of a portion of damper 13 showing the relative positions of members 15 and 16.

Like characters of reference designate like parts in each of the several views.

Referring to the drawings there is illustrated a conventional wood burner 1 having an outlet 2, a draft stack 4, and a draft stack elbow 3, and a cap 5 on the draft stack 4. The upper portion of draft stack 4 is partly encased by an envelope 6 in a portion of which is mounted a water pan 6a, as shown in Fig. 5. The chamber 7 of the envelope contains the draft regulator mechanism. The draft stack 4 is provided with an inverted cup 8 having an annular offset bead 9 to seat on the draft stack 4 spaced from the top of the stack. The inverted cup 8 has a cut out portion 12 having a semi-circular dished downwardly offset flange and an opposite raised or upwardly offset flange 11. I provide a circular disk damper 13 mounted on the axis rod 14 which in turn extends through the extension mountings or flanges 15 carried by the damper 13, as shown in Figs. 6 and 9. I provide a push rod 18, one end of which is provided with an eye 18a which engages a cotter pin 17 which is inserted through the apertures 17a of the projections 16, as shown in Figs. 5, 6, and 9. The push rod 18 is in turn inserted through the aperture 20 and operatively engages the upper portion of the thermostat rod 19 which is a bi-metal element. The circular lower end 22 of the thermostat rod 19 is pivotally mounted on a round rod or pin 21. Near the lower end of the thermostat rod 19 there is a hump or projection 23 which operatively contacts with the beveled face of cam 33. Means for mounting the thermostat rod 19 consists of two elements, namely, a U-shaped vertically disposed plate 24 having opposite apertures 25 in its sides to receive the pin 21 which is the axis and support of the circular lower end 22 of thermostat rod 19, and a single aperture 26 in the upper central portion of the plate for insertion of a bolt or screw with its appropriate nut 27 by which the U-shaped plate 24 is fastened to the outside surface of the wall of the draft stack 4, as shown in Fig. 6. A second U-shaped plate 28 which is horizontally disposed and the ends of which are vertically disposed has its longer end 29 positioned in contact with the central portion of U-shaped plate 24 with aperture 30 in member 29 aligned with the aperture 26 of the plate 24 whereby the screw 27 may engage both members 29 and 24 to hold them in a position mounted against draft stack 4. The shorter vertical end 31 of the U-shaped plate 28 has an aperture 32 through which the screw 34 extends. A cam 33 is affixed to the inner end of shaft or screw 34; an operating knob 35 is fastened on the other end of screw 33. Knob 35 carries a dial plate 36, as shown in Figs. 4 and 6. Adjacent and spaced on opposite sides of the dial plate 36 are the letters H and C with arrows which designate which way the knob should be turned to increase or decrease the heat. As shown in Fig. 3, a stop 38 is provided on cam 33 to limit the movement of the cam in the direction indicated by the arrows in Fig. 3. Cam 33 has only an approximately 300 degree range of movement. The cam is beveled, as shown in Fig. 6. I provide opposite slots 12a in the cup 8 to allow necessary space for the swinging or pivotal movement of damper 13 while at the same time acting as an effective closure for the plate without necessitating an absolutely perfect fit of all parts.

In use a conventional wood heater such as shown in Figs. 1 and 2 is used having a draft stack 4 provided with a perforated cap 5 and cup 8 and damper 13. The damper 13 is opened by gravity as the pivotal axis 14 is offset from center of plate 13. It is closed by push rod 18. The push rod in turn is attached to the upper end of a bi-metallic element or thermostat rod 19 which expands and contracts with temperature

changes. Ears 40 on push rod 18 engage thermostat rod 19 at slot 20, and member 19 thus operates rod 18. Rod 19 may be manually adjusted by the rotation of knob 35, the cam face of which impinges against the hump or projection 23 near the lower end of the thermostat rod 19. The thermostat rod 19 is pivotally mounted on pivot rod or pin 21, which rod in turn is mounted on the U-shaped plate 24.

The envelope 6 which partly surrounds the heater and draft stack 4, besides enclosing the thermostat-controlled mechanism of the damper, also functions as a supporting chamber for a pan 6a which contains water to give the needed humidity to the atmosphere of the brooder.

What I claim is:

1. In combination with a wood heater of the type described, having a draft stack, a pivotally mounted damper in the upper end of the stack and associated damper operating mechanism adjacent thereto, a thermostat mounted exteriorly of the stack and connected to the damper operating mechanism, and an envelope partly surrounding and engaging the outer surface of the draft stack, said envelope concealing the thermostat and associated damper-operating mechanism and adapted to contain a pan of water also contained in and supported by said envelope.

2. In combination with a wood heater of the type described, having a draft stack, a pivotally mounted damper to control said stack, a push rod operatively connected to said damper, a thermostat operatively connected with said push rod, means for manually adjusting the thermostat when desired, an envelope adjacent the stove and partly surrounding the draft stack, a U-shaped plate bolted to the wall of the draft stack, a second U-shaped plate having its central portion horizontally disposed and having one of its ends mounted in the first U-shaped plate and also bolted to said plate and to the draft stack, and having its other end apertured and positioned adjacent the envelope and adapted to receive the shaft of the manually operated adjusting means.

3. In combination, a wood-burning stove of the class described, said stove having a down-draft inlet stack extending adjacent to a wall portion of the stove, a damper for effecting the control of air through said down-draft stack, a housing against the stove and adjacent said stack constituting a chamber formed so as to exclude room air currents and positioned with respect to the stove to receive radiant heat therefrom, a thermostat positioned interiorly of said chamber so as to be responsive substantially solely to radiant heat from said stove, means interconnecting said thermostat and said damper, and means manually adjustable exteriorly of said housing acting through said thermostat for adjusting the setting of the thermostat to control the draft through the stove.

4. In combination, a wood-burning stove of the class described, said stove having a down-draft inlet stack adjacent to a wall portion of the stove, a damper for effecting the control of air through said down-draft stack, means constituting a chamber adjacent said stack formed so as to exclude room air currents from the chamber and positioned closely adjacent said stove so as to receive radiant heat therefrom, a thermostat positioned in said chamber so as to be responsive substantially solely to radiant heat from said stove, means interconnecting said thermostat and said damper, and means manually adjustable for varying the setting of the thermostat-damper to control the draft through the stove.

C. DELEVAN MONTAGUE.