Sept. 21, 1943. P. WINGERT 2,329,968

DRAFT REGULATOR

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Fig. 1

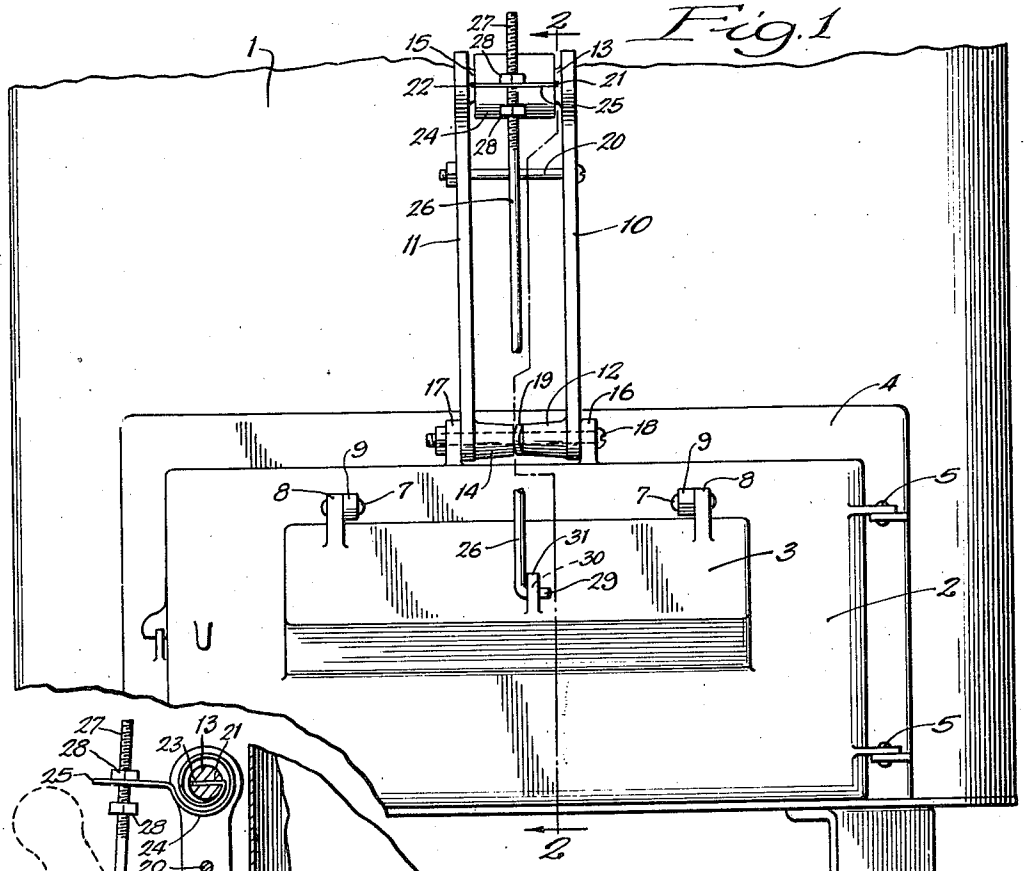
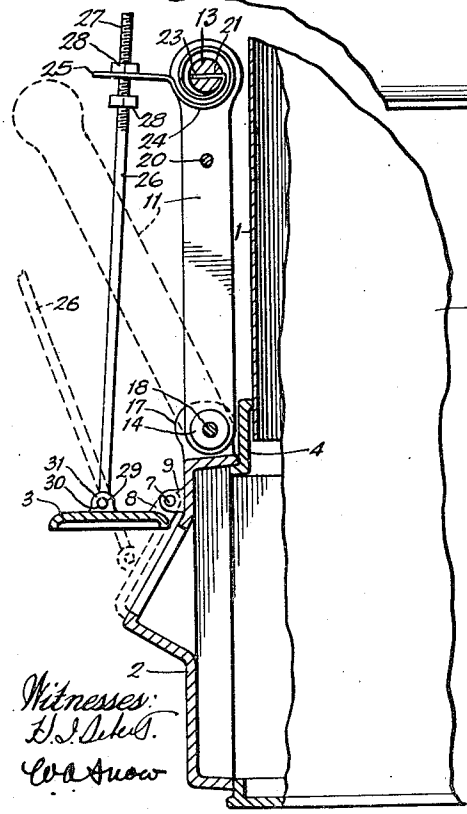


Fig. 2



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Fig. 3

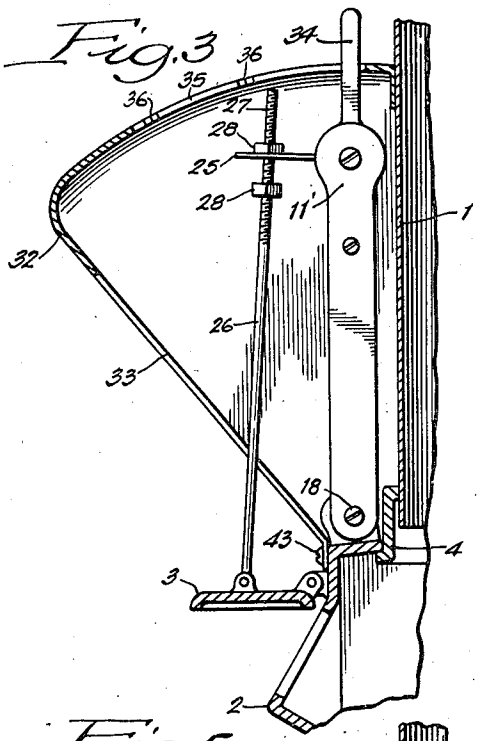


Fig. 4

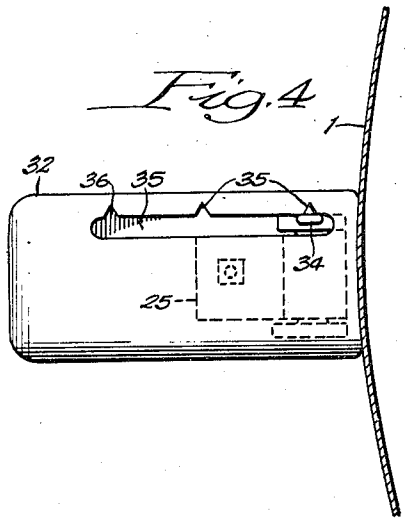
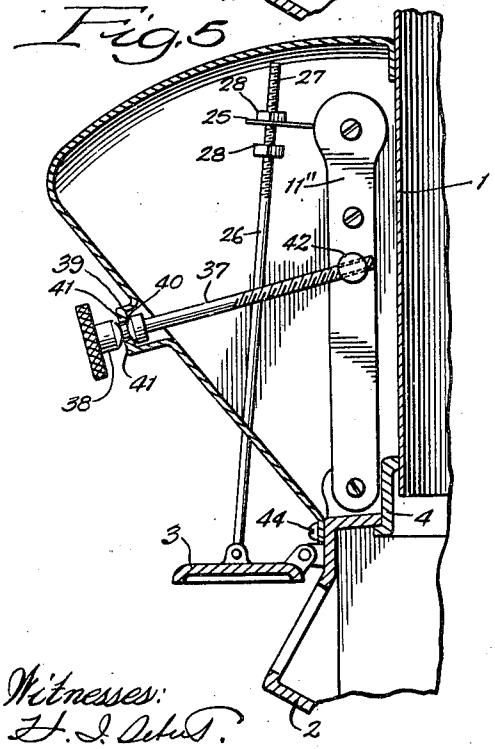


Fig. 5



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UNITED STATES PATENT OFFICE

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DRAFT REGULATOR

Paul Wingert, Montpelier, Ohio

Application November 16, 1942, Serial No. 465,675

11 Claims. (Cl. 236—96)

This invention relates to improvements in primary draft regulators for stoves and furnaces.

The main objects of this invention are to provide an improved draft regulator for stoves and furnaces; to provide a draft regulator which is subject to the temperatures of the jacket lining or shell of stoves and furnaces; to provide a regulator of this character which is secured to the ash pit door, and arranged to be manually shiftable about a pivot to "set" the regulator in any predetermined position with respect to the jacket lining or shell; to provide a thermostatic device for actuating the primary draft door of a stove or furnace; and to provide a regulator of the class described which is compact, simple in construction and inexpensive to manufacture.

Illustrative embodiments of this invention are shown in the accompanying drawings in which

Fig. 1 is a front plan view, with parts shown broken away, of my improved regulator and showing it mounted on an ash pit door of a stove or furnace.

Fig. 2 is a cross-sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a vertical cross-sectional view of a modified form of my invention.

Fig. 4 is a top plan view of the device shown in Fig. 3.

Fig. 5 is a vertical sectional view of a still further modified form of my invention.

Referring to the embodiment of my invention which is shown in Figs. 1 and 2, only the lower front portion of the stove is illustrated and comprises a shell or casing 1; and ashpit door 2 having a primary draft door 3 incorporated therein. The ashpit door 2 is pivotally secured to the door frame 4 by means of pivot bolts 5; and is secured to the shell or casing of the stove in the usual manner. The stove as a whole is supported by legs 6 to space the stove above the floorline and provide for ready air circulation.

The primary draft damper door 3 is pivotally secured to the ashpit door 2 by means of pivot bolts 7 which are threaded through ears 8 and 9 contained on the doors 3 and 2 respectively.

The mechanism comprising the thermostatic control device comprises a pair of vertically extending arms 10 and 11 each provided with inwardly extending hubs 12, 13 and bosses 14 and 15 respectively. The lower ends of arms 10 and 11 are arranged to be inserted between the upstanding perforated ears 16 and 17 located on the upper edge of the ashpit door 2 and be pivotally secured thereto by means of the spindle bolt 18. To insure a tight friction fit, a lock washer 19 is inserted between the inner faces of hubs 12—14 and is threaded on bolt 18. The upper ends of the arms 10 and 11 are secured together by the tie bolt 20 to hold the arms in parallel relationship to each other.

The bosses 13 and 15 are each cleft endwise from their inner faces, as shown by the numerals 21 and 22, for the reception and retention of the inner end 23 of the temperature responsive device which in this instance is a bimetallic coil 24. The inner end portion 23 of coil 24 is secured to and retained in the clefts 21—22 of the bosses 13—15 respectively by compression of the arms 10 and 11 when the arms are tied in position by bolt 20. The outer or free end 25 of coil 24 is bent substantially at right angles to the coil 24 and is provided with an aperture through which the upper end of rod 26 is inserted. The upper end of rod 26 is externally threaded at 27 and a pair of nuts 28 are threaded thereon, one disposed on each side of the end portion 25 of coil 24. The lower nut 28 is spaced a short distance from the lower face of the end portion 25. This prevents the rod 26 from becoming disengaged from the coil 24. The lower end 29 of the rod 26 is bent at right angles thereto and the end 29 is inserted in the perforation 30 of the ear 31 located on the primary draft door. This provides a direct connection between the thermostatic element and the primary draft door whereby upon expansion or contraction of the coil 24, the end portion 25 will be moved upwardly or downwardly and consequently actuate the primary draft door 3 to open or close the same.

It will readily be understood that upon contraction of the coil 24, the end portion 25 of said coil will move in an upwardly direction causing the draft door 3 to open and permit fresh air to enter the fire pot and stimulate burning in the stove. As the fire burns the heat radiated from the stove jacket will affect the bimetallic elements of the coil 24 and cause the coil to expand, thereby moving the end portion 25 in a downwardly direction to close the primary draft door 3. Upon cooling of the stove the coil 24 will contract and move the end portion 25 in an upwardly direction and thereby open the draft door 3.

Additional control of the thermostatic element may be had by manually shifting the arms 10 and 11, as a unit, forwardly about the spindle 18. The distance the coil 24 is moved away from the stove is dependent upon the will of the operator of the stove. The greater the distance the coil is moved away from the stove, the greater the distance the

heat radiated from the stove or furnace shell must travel to actuate the thermostatic element. Hence the burning rate of the fuel in the stove is slower when the coil is positioned away from the stove shell and considerably faster when the coil is positioned closer to the shell.

In the modified form of construction as shown in Figs. 3 and 4, I have placed a housing or cover 32 over the entire thermostatic control device to enclose and envelop the same and thereby enhance the general appearance of the stove. The housing 32 is provided with an elongated slot 33 so as to allow for ready movement of rod 26 since the rod must extend therethrough for actuation of the primary draft damper. The arm 11 is provided with a vertically extending handle bar 34 which is arranged to extend through the slot 35 contained in the upper wall of the housing 32. The upper wall is also provided with a series of notches 36 which terminate in and form a part of the slot 35. The spacing of notches 36 is calibrated by the manufacturer and placed in a predetermined position according to his standard of stove consumption control and hence temperature control. Each of the notches may then be given a value. By this simple means the rate of burning of the fuel in the stove is under the direct control of the user of the stove by the mere shifting of the handle 34 and hence the coil, to any position desired.

In the modification shown in Fig. 5, I show another manner of setting the arms 10 and 11 to accomplish the same general result as the apparatus disclosed in Figs. 3 and 4 except that I employ a steep pitched adjusting screw 37, the shank 38 of which is mounted in the hollow boss 39 and is rotatable therein. The shank 38 is provided with a channel 40 into which the inwardly turned ends 41 of the boss 39 are arranged to seat. An internally threaded boss 42 is secured to the arm 11'' into which the screw 37 is threaded. It can readily be seen that by turning the knurled head of the screw 37 the arm 11'' may be adjusted with respect to the stove shell to "set" the thermostatic element in any position desired, either away from or closer to the stove jacket.

In both of the modifications the cover plates are secured to the ashpit door in any suitable manner to retain them in position. In both modifications I have shown them secured to the ashpit door 2 by screws 43—44 respectively.

In all the embodiments shown it will be apparent that the draft control device shifts as a unit with the opening or closing of the ashpit door 2, and in the embodiments shown in Figs. 3 to 5 the housings 32 also move as a unit with the opening or closing of the ashpit door 2.

It is to be understood that some of the details set forth may be altered or omitted without departing from the spirit of my invention as defined by the following claims.

I claim:

1. In a stove or furnace having a jacket, an ashpit, an ashpit door and a primary draft door hingedly connected to said ashpit door, a draft regulator therefor comprising a pair of vertically extending parallelly spaced arms pivotally secured at their lower ends to the ashpit door, a thermostatic coil positioned between the upper ends of said arms and having its inner end secured to said arms, the free end of said coil projecting laterally therefrom, a connecting rod secured at one end to said free end of said coil and at the other end to said primary draft door for actuation of said draft door upon expansion and contraction of said coil.

2. A device of the character described in claim 1 wherein said arms are adapted to be manually shifted about said pivot toward or away from said jacket and means for retaining said arms in any position to which said arms are shifted.

3. A regulator device for stoves and furnaces having an ash pit door comprising a pair of vertically extending, parallelly spaced arms pivotally secured at their lower ends to said ashpit door, a primary draft door embodied in said ashpit door, a thermostatic coil secured between said arms adjacent the upper ends thereof, and link means between said thermostatic coil and said draft door, the upper end of said link means being secured to one end of said thermostatic coil and the lower end of said link means being secured to said draft door whereby said draft door is actuated upon expansion and contraction of said coil.

4. A device of the character set forth in claim 3 wherein the thermostatic coil is secured to the free end of said arms and said arms are adapted to be manually shifted about said pivot for positioning and "setting" the coil with respect to the stove or furnace shell.

5. In a stove or furnace having a jacket, an ashpit door and a primary draft door hingedly connected to said ashpit door, a draft regulator therefor comprising a pair of vertically extending parallelly spaced arms, each arm being provided with an inwardly extending tapered boss located adjacent the upper end thereof, and cleft endwise from the face ends thereof, the free ends of each of said bosses arranged for abutting engagement face to face, an inwardly extending hub on the lowest ends of each arm, a pair of vertically extending spaced ears integrally secured to the upper edge of said ashpit door located substantially medially of the ends of said door, spindle means for pivotally securing the lower ends of said arms between and to said ears, means to secure said arms in parallel relationship to each other, a thermostatic coil surrounding said bosses, the inner end of said coil being adapted to seat in the clefts of said bosses and be secured therein, the free end of said coil extending laterally beyond the body of said coil, and a connecting rod secured at one end to said free end of said coil and the other end to said draft door, whereby upon contraction or expansion of said coil due to temperature changes of said jacket said draft door will be actuated thereby.

6. Apparatus according to claim 5 wherein a friction element is provided between the face ends of said hubs whereby said arms may be shifted about said spindle and be frictionally held in any position to which the arms are shifted.

7. Apparatus according to claim 5 wherein the draft regulator is contained within a housing which envelops said regulator, and means for manually shifting and setting said arms located outside of said housing.

8. A regulator device for stoves and furnaces having an ashpit door comprising a pair of vertically extending, parallelly spaced arms pivotally secured at the lower ends to said ashpit door, a primary draft door embodied in said ashpit door, a temperature responsive device secured between the upper ends of said arms, and link means between said temperature responsive device and said draft door, the upper end of said

link means being secured to said temperature responsive device and the lower end of said link means being secured to said draft door whereby upon movement of said temperature responsive device said draft door is actuated.

9. In a stove or furnace having a jacket, a primary draft door hingedly connected to said jacket, a draft regulator therefor comprising a pair of vertically extending parallelly spaced arms pivotally secured at their lower ends to the outer wall of said jacket, a thermostatic coil positioned between the upper ends of said arms and having its inner end secured to said arms, the free end of said coil projecting laterally therefrom, a connecting rod secured at one end to said free end of said coil and at the other end to said primary draft door for actuation of said draft door upon expansion and contraction of said coil.

10. In a stove or furnace having a jacket, a primary draft door hingedly connected to said jacket, a draft regulator therefor comprising a pair of spaced arms pivotally secured at one end to said jacket, and said arms lying along the outer wall of said jacket, a thermostatic coil positioned between the free ends of said arms and having its inner end secured to said arms, the free end of said coil projecting laterally therefrom, a connecting rod secured at one end to the free end of said coil and at the other end to said primary draft door for actuation of said draft door upon expansion and contraction of said coil.

11. In a stove or furnace having a jacket, a primary draft door hingedly connected to said jacket, a draft regulator therefor comprising a pair of spaced arms pivotally secured at one end to said jacket, and said arms lying along the outer wall of said jacket, a thermostatic coil positioned between the free ends of said arms and having its inner end secured to said arms, the free end of said coil projecting laterally therefrom, a connecting rod secured at one end to the free end of said coil and at the other end to said primary draft door for actuation of said draft door upon expansion and contraction of said coil, and means for manually shifting the entire coil toward and away from said jacket.

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