Sept. 19, 1944. E. A. FIELD, JR 2,358,390

AUTOMATIC THERMALLY-RESPONSIVE DRAFT CONTROL

Filed Aug. 3, 1942 2 Sheets-Sheet 1

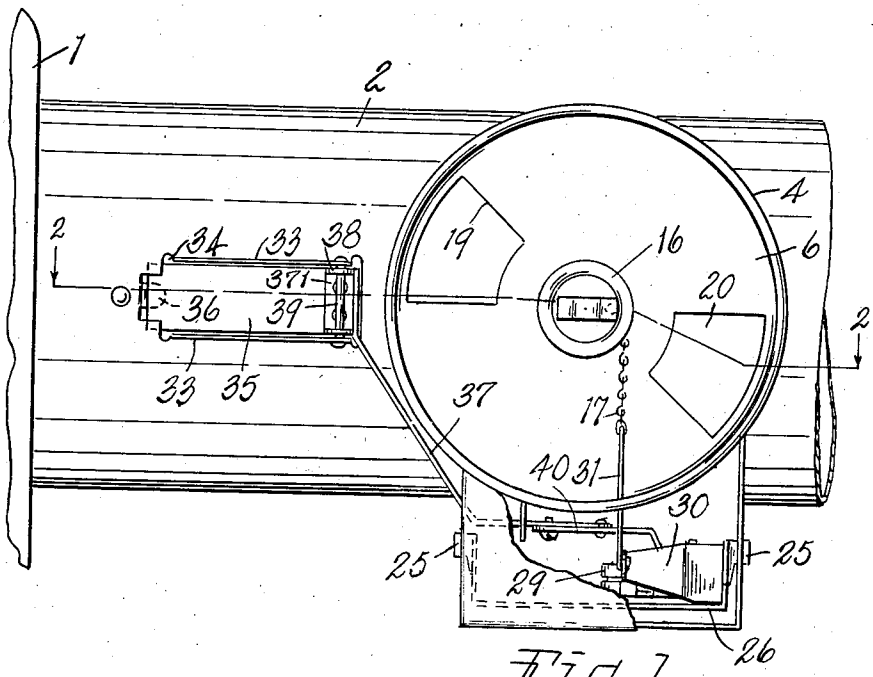


Fig. 1

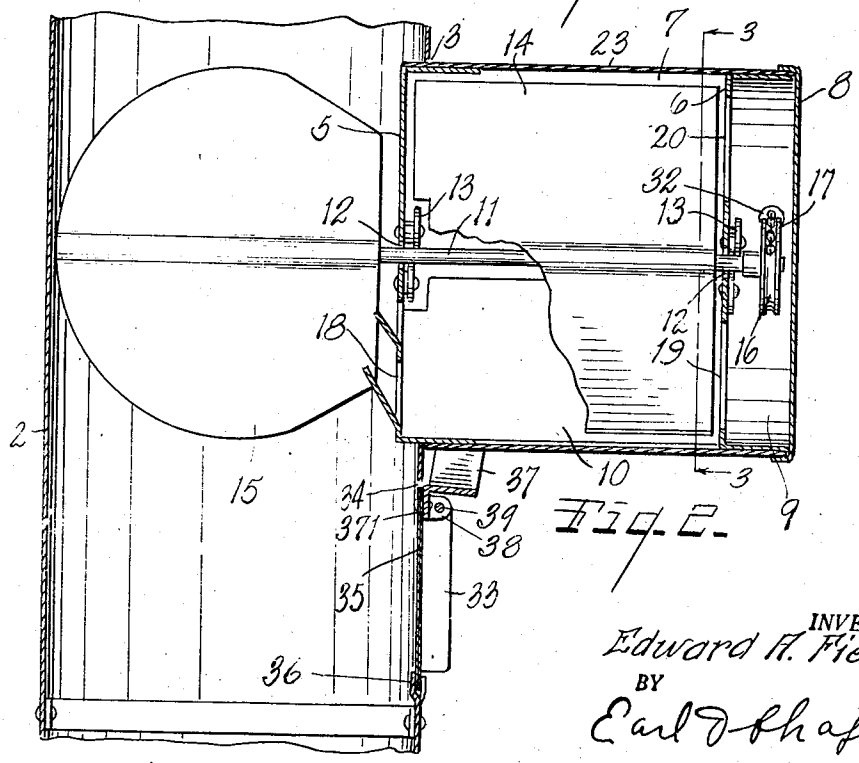


Fig. 2.

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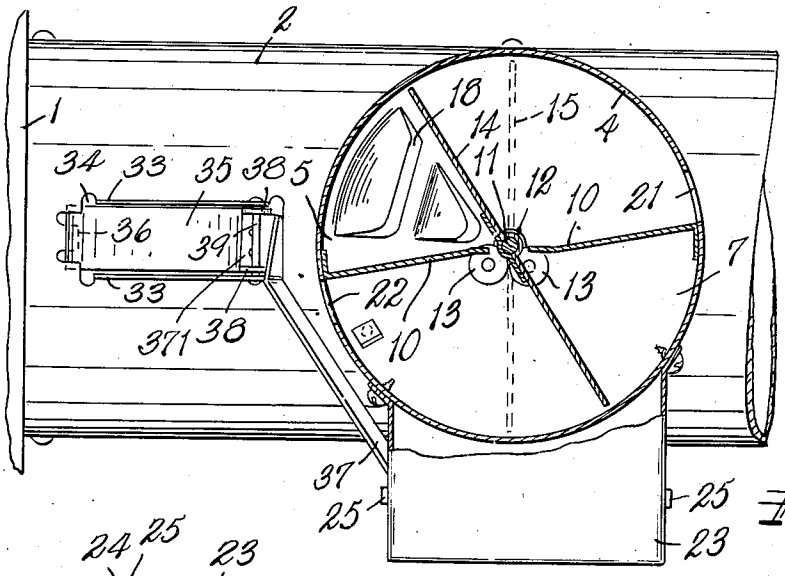


Fig. 3.

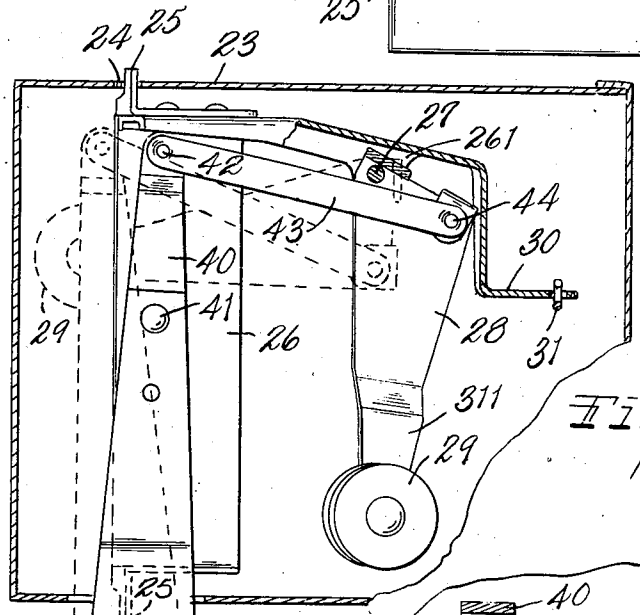


Fig. 4.

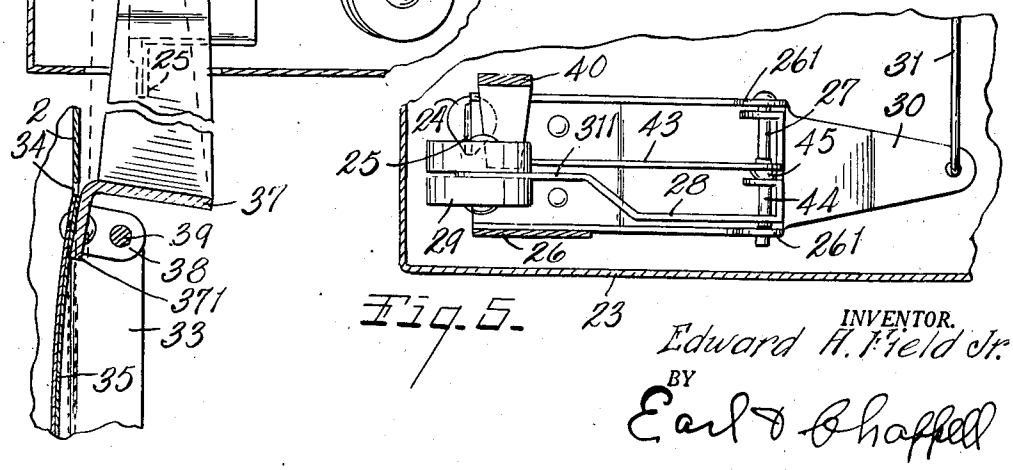


Fig. 5.

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UNITED STATES PATENT OFFICE

2,358,390

AUTOMATIC THERMALLY RESPONSIVE DRAFT CONTROL

Edward A. Field, Jr., Mendota, Ill.

Application August 3, 1942, Serial No. 453,402

14 Claims. (Cl. 236—45)

This invention relates to improvements in automatic thermally-responsive draft control.

The main objects of the present invention are:

First, to provide a blocking type draft control device for combustion heaters which are dependent entirely upon natural draft for their air supply.

Second, to provide a blocking type, thermally responsive draft control of the type described which is sensitive to the temperature of the flue gases of the heater to effect regulation of the draft in accordance with said temperatures, appropriately increasing the draft when the temperature in the flue rises and decreasing the draft when the temperature falls, and thereby desirably increasing the draft for high burning rates, which are accompanied by increased flue temperature.

Third, to provide a draft control of the type described, preferably for oil burning space heaters, which is effective to closely regulate the air draft of said heaters in accordance with the flue temperature, to provide efficient combustion and thereby prevent wasteful combustion on the one hand due to excessive draft and accumulation of soot on the other hand due to too low a draft.

Fourth, to provide a device of the type described which is exceedingly sensitive in its operation, having provision for offsetting or neutralizing factors normally tending to detract from the accuracy of operation, and which is exceedingly simple and inexpensive in its parts notwithstanding its sensitivity.

Further objects relating to details and economies of the invention will appear from the description to follow. The invention is defined in the claims. A structure embodying the features of the invention is illustrated in the accompanying drawings, wherein:

Fig. 1 is a front view illustrating a blocking type draft control responsive to flue gas temperatures to regulate the draft automatically in accordance with this invention.

Fig. 2 is a fragmentary view in section on a line corresponding to line 2—2 of Fig. 1, further illustrating the arrangement of the parts.

Fig. 3 is a fragmentary view partially broken away and in section on a line corresponding to line 3—3 of Fig. 2.

Fig. 4 is an enlarged fragmentary view in vertical section, illustrating the operation of the control in solid and dotted lines.

Fig. 5 is an enlarged fragmentary view in vertical section further illustrating the manner of operation of the compensator means in the operation of the control.

The present invention relates to an automatic, thermally responsive draft control for a heater or other combustion device relying entirely upon natural draft, and preferably an oil burning unit. A similar device is illustrated and described in my copending application Serial No. 453,400 filed concurrently herewith, in which application the theory and operational advantages of the specific structural details are explained at length; hence only sufficient description will be made in the present application to enable those skilled in the particular art to adapt and carry into practice the present invention.

As illustrated in the aforesaid application Serial No. 453,400, the automatic, thermally responsive features of the device are applied to a control of the counterweighted gate type. The present invention pertains to the application of the principle of such an automatic, thermally responsive device to a blocking type draft control in which a damper is disposed in the heater smoke flue to regulate the draft therein. A control of this type is illustrated and fully described in my Patent No. 2,259,130 dated October 14, 1941, and the control herein shown is similar in most respects to the same, except where the operative connection of the thermally responsive device or mechanism entails some change. In the present embodiment the thermally responsive mechanism and its connections to the control are very effective in maintaining the draft for the heater proportional to the temperature in the flue, thereby preventing wasteful combustion and undue accumulation of soot such as result when the draft is excessive or insufficient.

The structural details of the blocking type control or regulator will first be briefly described, it being understood that reference may be had to my patent identified above for further information as to the specific construction, operation and advantages thereof.

The reference numeral 1 generally designates a space heater, stove or other unit reliant entirely upon natural draft for its operation and preferably utilizing an oil burner. Reference numeral 2 designates a smoke flue through which products of combustion of the heater are discharged to a chimney. This flue has a lateral opening 3 therein in which a cylindrical control housing 4 is disposed, the housing having circular end plates 5, 6 defining a control chamber 7, and an additional outer end closure plate or

disk 8 defining a space 9 which is to a large extent sealed from the atmosphere.

Control chamber 1 is divided approximately in half by a transverse diametral partition 10, which is interrupted at its central point to receive a shaft 11 extending concentric with the control housing longitudinally thereof. Said shaft extends through the openings 12 in the chamber end plates 5, 6 and is appropriately journalled for friction-free rotation by means of rotatable disks 13 adjacent said openings. Shaft 11 has a control vane 14 secured thereon which is only slightly smaller in radial dimension than the diameter of the housing and only slightly smaller in axial length than the axial dimension of the housing as illustrated in Figs. 2 and 3, the halves of said vane extending on opposite sides of the shaft 11 into the two semi-cylindrical control chamber portions defined by partition 10. Shaft 11 also extends through end plate 5 into the flue 2 and has secured thereto the damper 15, so that the damper and control vane 14 rotate as a unit. Shaft 11 also extends through end plate 6 into the space 9 between plate 6 and closure disk 8, where it has secured thereto a suitable pulley or drum 16 to which a compensating chain 17 is secured. Chain 17 applies a predetermined torque on the shaft 11 to position the vane and damper appropriately for the desired draft.

The invention is concerned with a variable application of torque on shaft 11 in accordance with the temperature in flue 2, the aforesaid torque on the shaft representing the differential between the force attributable to atmospheric pressure acting on the vane and a variable compensating force applied directly to the chain to offset or counteract said force, all in the manner to be described.

Control housing 4 communicates with the interior of flue 2 through louvered openings 18 in the inner control chamber end plate 5. The other end plate 6 is provided with upper and lower openings 19, 20 by which opposite, semicircular portions of the control chamber 7 on either side of partition 10 communicate with the space 9 to the right of the control chamber as viewed in Fig. 2. As illustrated in Fig. 3, the control housing is likewise provided with radial openings 21, 22 on opposite diametral sides thereof communicating with atmosphere, these being positioned so that the atmospheric air is effective on the side of vane 14, in the upper and lower portions of the control chamber, opposite from the side which is subject to vacuum, as clearly described in my Patent No. 2,259,130. The flue vacuum is directly effective on the control chamber through the louvered openings 18 on one side of vane 14, then through upper communicating opening 19, the end space 9 and the lower communicating opening 20 to the lower portion of the control chamber tending to swing vane 14 in counter-clockwise direction as viewed in Fig. 3, when the draft in flue 2 increases. This movement is transmitted to the damper 15, which is arranged at an angle to the vane on the common shaft 11, to adjust the damper.

In my patent referred to above, movement of the control vane in response to atmospheric force on one side thereof and flue vacuum on the other is resisted by a suitably chosen weight adjusted to maintain the proper draft under normal conditions. In accordance with my present invention provision is made that an automatically variable force is applied to effect this resisting action, said force being varied in accordance with the temperature of the flue gases to thereby appropriately vary the draft. Said device will now be described.

Referring to Figs. 1, 4 and 5, the housing 4 has secured to the lower side thereof a supporting bracket 23 provided in opposite sides thereof with V-notch openings 24 in which laterally extending knife edge pivot portions 25 of a stirrup-like rocker member or support 26 are received. This rocker member is provided on one side with inturned ears 261 pivotally receiving a vertically disposed pivot pin 27 to which a compensating weight swing arm 28 is secured and which has a compensating weight 29 on the free end thereof, provision being made to secure a very free frictionless lateral pivoting of the swing arm on the rocker member by said pivot pin.

Extending forwardly from and rigidly secured to the rocker member 26 is a rocking compensator control arm 30, to the free forward end of which a link 31 is attached. Said link extends upwardly through a small hole 32 in the portion of control housing 4 defining chamber 9 and is in said chamber connected to the compensating chain 17. Hence rocking movement of the rocker support 26, rather, the variable rocking torque applied to said member, due to the variable eccentricity of weight 29 relative to the knife edge pivots 25, is effective through arm 30, link 31, and chain 17 on pulley 16, to effect the result to be described, by entirely or partially counteracting the torque on vane shaft 11 attributable to atmospheric pressure.

The swing arm 28 which is pivoted by pin 27 for swinging movement transverse the plane of rocking movement of rocker support 26, is vertically offset at 311 so that the compensating weight 29 which is attached to the end of the swing arm has the center of gravity thereof disposed in a plane passing through the pivotal axis of the rocker support 26 at the knife edges 25, for the purpose pointed out in my said copending application. Obviously, as compensating weight 29 swings closer to or farther away from said rocker member support axis, the torque exerted on the rocker member, hence exerted by arm 30 on link 31, is varied. In order to effect the aforesaid swinging of the compensating weight, a linkage is provided including a thermally responsive element in the manner to be described.

Flue 2 is appropriately slit and has parallel flanges 33 struck out therefrom to define a lateral opening 34 (Figs. 3 and 4), and in the opening thus provided is disposed a flat elongated thermal element, preferably a flat bimetallic strip or blade 35, secured at one end to the flue by means of a lug 36. At its other end the thermal element is riveted to an offset portion 371 on an actuating arm 37, the latter being provided with ears 38 receiving a pivot pin 39 by means of which it is pivoted on the projecting flanges 33. The thermal element is disposed so that increase in heat in the flue causes the same to warp or bow inwardly of the flue, as from the dotted line position to the solid line position of Fig. 4, correspondingly pivoting the actuating arm 37 about its pivot point 39. Actuating arm 37 has an extension adjustably mounted thereon at 41, the purpose of this adjustability being fully explained in the copending application. This arm extension is pivotally connected at 42 to a link 43, which is in turn pivotally connected eccentrically at 44 to the compensating weight

swing arm 28. The connection is such that rotative movement of actuating arm 37, for example in counter-clockwise direction from solid to dotted lines as viewed in Fig. 4, produces clockwise direction of the arm 28 and vice versa. The pivots of the link to the swing arm 28 and actuating arm extension 40, respectively, are disposed in a plane including the pivotal axis of the rocking support 26, and said pivots are provided with rounded, anti-friction, convex bearings 45 to prevent binding upon relative movement of the parts, all as described in detail in my said copending application.

In the operation of the control, the swing arm compensating weight 29 occupies the position thereof nearest the pivotal axis of the rocker member 26 on knife edges 25 when the flue temperature is at minimum, as shown in dotted line in Fig. 4. In this position the rocker member 26 exerts minimum torque on link 31 and chain 17. The weight is swung outwardly and forwardly therefrom, as from dotted line to solid line position in Fig. 4, when the temperature in flue 2 increases, with resultant inward bowing of the bimetallic element 35 to the solid line position. Thus increased compensating torque is applied by chain 17 to the vane shaft 11. When the temperature decreases from an elevated condition, the action is the reverse, the weight swinging inwardly in the direction from the solid to the dotted line position in Fig. 4, decreasing the torque effective on the rocker member 26 at its pivotal knife edge axis, with resultant decrease in the compensating torque exerted by chain 17 on the pulley 16. In any position of the compensating weight 29 there is corresponding torque on the pulley in opposition to the atmospheric pressure on vane 14. As the temperature of the flue gases increases this last named torque is increased, and it will be noted that the rate of increase of torque in the lower temperature range is slower than at the higher flue temperatures, since the component of outward, moment arm increasing movement in the swing of weight 29 is less during the early part of said swing than during the later. This is also a highly desirable feature. The torque on the pulley is automatically selected to predeterminedly oppose the atmospheric pressure on vane 14 at a given flue gas temperature, and therefore maintain damper 15 in a predetermined position under a predetermined normal draft condition. Should such condition vary without an increase in the flue gas temperature, the damper is appropriately shifted by the differential between the atmospheric force on vane 14 and the selected pulley torque. Should the flue gas temperature rise or fall the pulley torque is varied appropriately by swinging of the compensating weight 29 away from or toward the axis of its moment arm and thereby effecting a corresponding alteration of the pulley torque to take care of this condition.

Various structural details of the thermally responsive control device have been referred to only briefly. For a fuller explanation thereof and of the advantages made possible thereby, reference may be had to my said copending application.

The present structure is extremely effective in regulating the draft of a heater during a blocking type control, by rendering the latter, which is ordinarily effective only in response to atmospheric conditions, likewise responsive to the temperature of flue gases, regulating draft in proportion to temperature. A very desirable control results. Not only is excessive draft with resultant waste of fuel, prevented but also insufficient draft, with resultant accumulation of soot, is likewise avoided. Thermal efficiency is greatly enhanced, this being accomplished entirely automatically and without requiring manual adjustment of the draft control by the operation thereof for different rates of combustion. Experience has shown that it is very rare indeed when any attention is ever given to this matter of varying the draft to correspond to the rate of combustion. This device departs distinctly from the operational principle of heretofore known thermally controlled draft devices in that it proportions the draft to the rate of combustion or to the flue gas temperature. Such heretofore known devices reduce draft with rising temperature, the exact opposite of my improved control. In the latter, using flue temperature as an indicator of burning rate, I am enabled to maintain high drafts for high burning rates, and vice versa, with decided improvement in thermal efficiency as a result.

I have illustrated and described the invention in embodiments which have been found satisfactory in operation. I have not attempted to illustrate other embodiments or adaptations, as it is believed this disclosure will enable those skilled in the art to embody the invention as may be desired.

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

1. An automatic, thermally responsive draft control for a natural draft combustion unit, comprising a control housing communicating with the smoke flue of said unit, said flue having a blocking damper therein and said housing having a control vane therein, a shaft common to said vane and damper to which the same are fixedly secured, the housing communicating with and exposing the vane to the flue on the upstream side of said damper and having an opening to atmosphere on the side of the vane opposite the flue-exposed side of the latter, and means responsive to flue temperature for biasing the vane in a direction opposing movement of the same under atmospheric pressure to thereby appropriately position said damper, comprising a rocking support pivoted on a bracket attached to the housing for rotation in a vertical plane, said support having operative torque transmitting connection to said shaft, a swing arm pivoted on said rocking support for movement transverse the plane of rocking movement of the support, said arm having a compensating weight thereon, and means for swingably actuating said arm in response to the temperature of the gases in said flue to increase the moment arm of said weight relative to the axis of said support upon increase in said temperature, comprising a thermally responsive element disposed adjacent and subject to the temperature in the flue, an actuating member connected to said element for actuation in response to the thermally controlled movement of the latter, and means pivotally connecting said actuating arm to said swing arm for swinging movement of the latter in response to said thermal changes, whereby the torque of said support about its pivotal axis is increased with increase in flue temperatures, with increased torque applied through said connection to said shaft in opposition to the atmospheric pressure on said vane.

2. An automatic, thermally responsive draft

control for a natural draft combustion unit, comprising a control housing communicating with the smoke flue of said unit, said flue having a blocking damper therein and said housing having a control vane therein, a shaft common to said vane and damper to which the same are fixedly secured, the housing communicating with and exposing the vane to the flue on the upstream side of said damper and having an opening to atmosphere on the side of the vane opposite the flue-exposed side of the latter, and means responsive to flue temperature for biasing the vane in a direction opposing movement of the same under atmospheric pressure to thereby appropriately position said damper, comprising a rocking support pivoted on a bracket attached to the housing for rotation in a vertical plane, said support having operative torque transmitting connection to said shaft, a swing arm pivoted on said rocking support for movement transverse the plane of rocking movement of the support, said arm having a compensating weight thereon, and means for swingably actuating said arm in response to the temperature of the gases in said flue to increase the moment arm of said weight relative to the axis of said support upon increase in said temperature, comprising a thermally responsive element disposed adjacent and subject to the temperature in the flue, and means operatively connecting said swing arm to said element for actuation in response to the thermally controlled movement of the latter, whereby the torque of said support about its pivotal axis is increased with increase in flue temperatures, with increased torque applied through said connection to said shaft in opposition to the atmospheric pressure on said vane.

3. An automatic, thermally responsive draft control for a natural draft combustion unit, comprising a control housing communicating with the smoke flue of said unit, said flue having a blocking damper therein and said housing having a control vane therein, a shaft common to said vane and damper to which the same are fixedly secured, and means responsive to flue temperature for biasing the vane in a direction opposing movement of the same under atmospheric pressure to thereby appropriately position said damper, comprising a rocking support pivoted for rotation in a vertical plane, said support having operative torque transmitting connection to said shaft, a swing arm pivoted on said rocking support for movement transverse the plane of rocking movement of the support, said arm having a compensating weight thereon, and means for swingably actuating said arm in response to the temperature of the gases in said flue to increase the moment arm of said weight relative to the axis of said support upon increase in said temperature, comprising a thermally responsive element disposed adjacent and subject to the temperature in the flue, and means operatively connecting said swing arm to said element for actuation in response to the thermally controlled movement of the latter, whereby the torque of said support about its pivotal axis is increased with increase in flue temperatures, with increased torque applied through said connection to said shaft in opposition to the atmospheric pressure on said vane.

4. An automatic, thermally responsive draft control for a combustion unit, comprising a control housing communicating with the smoke flue of said unit, said flue having a blocking damper pivoted therein and said housing having a control vane pivoted therein subject to the flue draft and atmospheric pressure on opposite sides thereof, means operatively connecting said vane and damper for conjoint movement, and means responsive to flue temperature for moving the vane in a direction opposing movement of the same under atmospheric pressure to thereby appropriately position said damper, comprising a rocker member having operative torque transmitting connection to said vane, a swing arm pivoted on said rocker member for movement transverse the axis of rocking movement of the latter, said arm having a compensating weight thereon, means for swingably actuating said arm in response to the temperature of gases in said flue to increase the moment arm of said weight relative to the axis of said rocker member upon increase in said temperature, comprising a thermally responsive element disposed adjacent and subject to the temperature in the flue and movable in response to temperature change therein, an actuating member connected to said element for actuation in response to the thermally controlled movement of the latter, and means pivotally connecting said actuating arm to said swing arm for swinging movement of the latter in response to said temperature changes, whereby the torque of said weight and rocker member about the pivotal axis of the latter is increased with increase in flue temperatures, with increased torque applied through said torque transmitting connection to said vane in opposition to the atmospheric pressure on the latter.

5. An automatic, thermally responsive draft control for a combustion unit, comprising a control housing communicating with the smoke flue of said unit, said flue having a blocking damper pivoted therein and said housing having a control vane pivoted therein subject to the flue draft and atmospheric pressure on opposite sides thereof, means operatively connecting said vane and damper for conjoint movement, and means responsive to flue temperature for moving the vane in a direction opposing movement of the same under atmospheric pressure to thereby appropriately position said damper, comprising a rocker member having operative torque altering connection to said vane, a compensating weight movably mounted on said rocker member for movement transverse the axis of rocking movement of the latter, means for moving said weight relative to said axis in response to the temperature of gases in said flue to increase the moment arm of said weight relative to the axis of said rocker member upon increase in said temperature, comprising a thermally responsive element disposed adjacent and subject to the temperature in the flue and movable in response to temperature change therein, an actuating member connected to said element for actuation in response to the thermally controlled movement of the latter, and means connecting said actuating arm to said weight for movement of the latter in response to said temperature changes, whereby the torque of said weight and rocker member about the pivotal axis of the latter is increased with increase in flue temperatures, with increased torque applied through said torque altering connection to said vane in opposition to the atmospheric pressure on the latter.

6. An automatic, thermally responsive draft control for a combustion unit, comprising a control housing communicating with the smoke flue of said unit, said flue having a blocking damper

pivoted therein and said housing having a control vane pivoted therein subject to the flue draft and atmospheric pressure on opposite sides thereof, means operatively connecting said vane and damper for conjoint movement, and means responsive to flue temperature for moving the vane to thereby appropriately position said damper, comprising a rocker member having operative torque altering connection to said vane, a compensating weight movably mounted on said rocker member for movement transverse the axis of rocking movement of the latter, means for moving said weight relative to said axis in response to the temperature of gases in said flue to adjust the moment arm of said weight relative to the axis of said rocker member, comprising a thermally responsive element disposed adjacent and subject to the temperature in the flue and movable in response to temperature change therein, and means connecting said element to said weight for movement of the latter in response to said temperature changes, whereby the torque of said weight and rocker member about the pivotal axis of the latter is adjusted in response to flue temperatures, with altered torque applied through said torque altering connection to said vane.

7. An automatic, thermally responsive draft control for a combustion unit, comprising a control housing communicating with the smoke flue of said unit, said flue having a blocking damper pivoted therein and said housing having a control vane pivoted therein subject to the flue draft and atmospheric pressure on opposite sides thereof, means operatively connecting said vane and damper for conjoint movement, and means responsive to flue temperature for moving the vane in a direction opposing movement of the same under atmospheric pressure to thereby appropriately position said damper, comprising a rocker member having operative torque altering connection to said vane, a compensating weight movably mounted on said rocker member for movement transverse the axis of rocking movement of the latter, means for moving said weight relative to said axis in response to the temperature of gases in said flue to increase the moment arm of said weight relative to the axis of said rocker member upon increase in said temperature, comprising a thermally responsive element disposed adjacent and subject to the temperature in the flue and movable in response to temperature change therein, and means connecting said element to said weight for movement of the latter in response to said temperature changes, whereby the torque of said weight and rocker member about the pivotal axis of the latter is increased with increase in flue temperatures, with increased torque applied through said torque altering connection to said vane in opposition to the atmospheric pressure on the latter.

8. An automatic, thermally responsive draft control for a combustion unit, comprising a control housing communicating with the smoke flue of said unit, said flue having a blocking damper therein and said housing having a control vane pivoted therein subject to the flue draft and atmospheric pressure on opposite sides thereof, a shaft common to said vane and damper to which the same are fixedly secured, means responsive to flue temperature for moving the vane to thereby appropriately position said damper, comprising a rocker member having operative torque altering connection to said shaft, a swing arm pivoted on said rocker member for movement transverse the plane of rocking movement of the rocker member, said arm having a compensating weight thereon, and means for swingably actuating said arm in response to the temperature of gases in said flue to adjust the moment arm of said weight relative to the axis of said rocker member, comprising a thermally responsive element disposed adjacent and subject to the temperature in the flue, and means operatively connecting said element to said swing arm for swinging movement of the latter in response to said thermally induced movement of the element, whereby the torque of said rocker member about its pivotal axis is adjusted in response to flue temperatures, with resultant alteration of the torque of said shaft through said torque altering connection.

9. An automatic, thermally responsive draft control for a combustion unit, comprising a control housing communicating with the smoke flue of said unit, said flue having a blocking damper therein and said housing having a control vane pivoted therein subject to the flue draft and atmospheric pressure on opposite sides thereof, means operatively connecting said vane and damper for conjoint movement, means responsive to flue temperature for moving the vane to thereby appropriately position said damper, comprising a rocker member having operative torque altering connection to said vane, a swing arm pivoted on said rocker member for movement transverse the plane of rocking movement of the rocker member, said arm having a compensating weight thereon, and means for swingably actuating said arm in response to the temperature of gases in said flue to adjust the moment arm of said weight relative to the axis of said rocker member, comprising a thermally responsive element disposed adjacent and subject to the temperature in the flue, and means operatively connecting said element to said swing arm for swinging movement of the latter in response to said thermally induced movement of the element, whereby the torque of said rocker member about its pivotal axis is adjusted in response to flue temperatures, with resultant alteration of the torque of said vane through said torque altering connection.

10. A draft control of the type described including a flue having a damper therein, a control housing communicating with the flue having a control vane movable therein and an opening to atmosphere on the side of said vane remote from the flue side thereof, a thermally responsive element disposed in proximity to said flue so as to be subject to the temperature of gases in said flue, an actuating arm connected to and movable in response to said element, a rocker member, means operatively connecting said vane to said rocker member for actuation thereby, said vane and damper being connected for movement as a unit, a swingable weighted compensating arm pivoted on said rocker member for movement transverse the pivotal axis of the latter, and means connecting said compensating arm to said actuating arm for swinging the compensating arm away from said pivotal axis in response to thermally induced actuation of the actuating arm, whereby to increase the moment arm of the weight on said compensating arm and thereby increase the torque exerted on said vane through said first named connecting means, as the flue temperature rises.

11. A draft control of the type described in-

cluding a flue having a damper therein, a control housing communicating with the flue having a control vane movable therein and an opening to atmosphere on the side of said vane remote from the flue side thereof, a thermally responsive element disposed in proximity to said flue so as to be subject to the temperature of gases in said flue, a rocker member, means operatively connecting said vane to said rocker member for actuation thereby, said vane and damper being connected for movement as a unit, a swingable weighted compensating arm pivoted on said rocker member for movement transverse the pivotal axis of the latter, and means connecting said compensating arm to said thermally responsive element for swinging the compensating arm away from said pivotal axis in response to thermally induced actuation of the actuating arm, whereby to increase the moment arm of the weight on said compensating arm and thereby increase the torque exerted on said vane through said first named connecting means, as the flue temperature rises.

12. A draft control of the type described including a flue having a damper therein, a control housing communicating with the flue having a control vane movable therein and an opening to atmosphere on the side of said vane remote from the flue side thereof, a thermally responsive element disposed in proximity to said flue so as to be subject to the temperature of gases in said flue, a rocker member, means operatively connecting said vane to said rocker member for actuation thereby, said vane and damper being connected for movement as a unit, a compensating weight mounted on said rocker member for movement transverse the pivotal axis of the latter, and means connecting said compensating weight to said thermally responsive element for movement of the weight away from said pivotal axis in response to thermally induced actuation of the last named connecting means, whereby to increase the moment arm of the weight and thereby increase the torque exerted on said vane through said first named connecting means, as the flue temperature rises.

13. A draft control of the type described, including a flue having a damper therein, a control housing communicating with the flue, a movable control vane in said housing, said housing having an opening to the atmosphere on the side of said vane opposite from the flue side thereof, said vane being operatively connected to said damper and tending to close the same by a decrease of pressure on the flue side of the vane relative to the atmospheric side thereof, a thermostat disposed in proximity to said flue so as to be subject to the temperature of gases passing through the flue, movable means operatively associated with said thermostat for resisting said closing movement of the damper by a force which increases when the temperature of the flue gases increase and decreases when said temperature decreases, whereby the damper is automatically opened and closed at relatively high temperatures as well as at relatively low temperatures of the flue gases.

14. A draft control of the type described, including a flue having a damper therein, a control housing communicating with said flue, a movable control vane in said housing, said housing having an opening to the atmosphere on the side of said vane opposite from the flue side thereof, said vane being operatively connected to said damper and tending to close the same by a decrease of pressure on the flue side of the vane relative to the atmospheric side thereof, damper opening means for resisting said closing movement and tending to open said damper, a thermostat disposed in proximity to said flue so as to be subject to the temperature of the gases passing through said flue, and means operatively associated with said thermostat and said damper opening means for resisting said closing movement of the damper by a force which increases when the temperature of the flue gases increase and decreases when said temperature decreases.

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