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R. W. FRANKS

2,206,033

STOKER AIR CONTROL

Filed Sept. 10, 1935

Fig. 1.

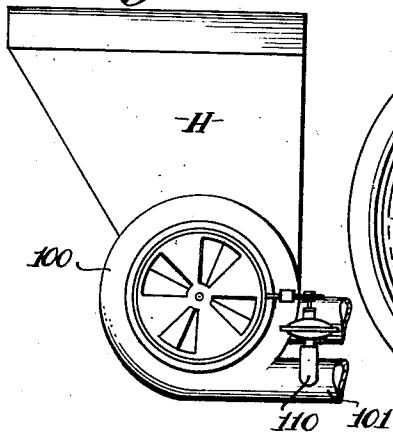


Fig. 5.

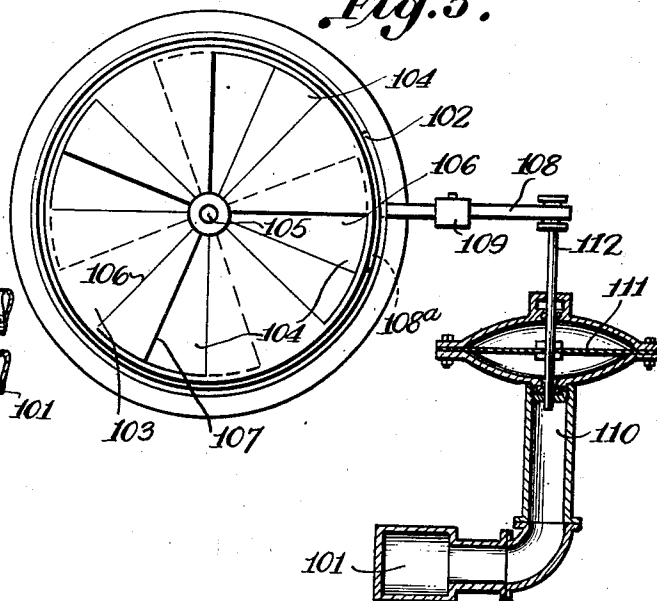


Fig. 4.

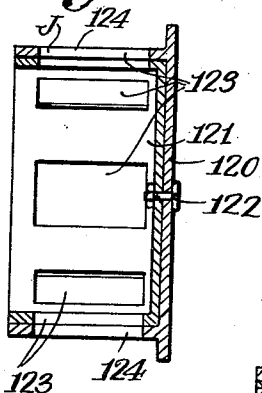


Fig. 2.

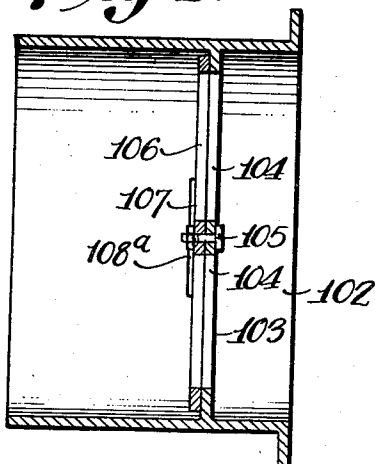
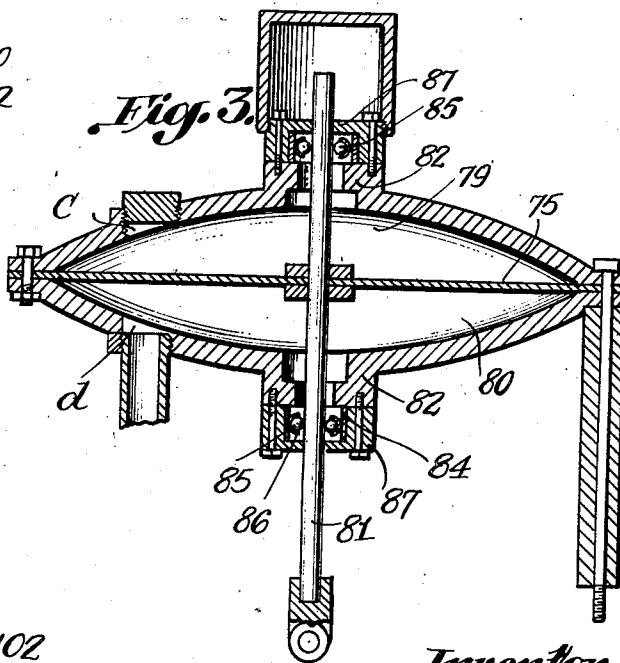


Fig. 3.



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UNITED STATES PATENT OFFICE

2,206,033

STOKER AIR CONTROL

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Application September 10, 1935, Serial No. 39,940

2 Claims. (Cl. 230-114)

My invention relates to stoker air control devices and has for its object to provide a new and efficient shutter or air valve to control the flow of air into the stoker commensurately with the pressure within the fire box.

A further object is to provide a stoker air control which may be connected with the boiler to control the flow of air into the stoker depending upon the temperature of the boiler and a still further object is to provide a control for stoker air which may be connected with a draft control device on the flue pipe of the furnace so that the stoker air is shut off when the flue suction decreases.

A still further object is to provide a stoker air control and diaphragm for actuating the control, said air control and diaphragm operating cooperatively so that the pressure in the air duct increases as the fuel bed increases in thickness and the pressure will back up to the diaphragm and shut off the supply of air commensurately.

These objects I accomplish with the device illustrated in the accompanying drawing in which similar numerals and letters of reference indicate like parts throughout the several views and as described in the specification forming a part of this application and pointed out in the appended claims.

This application is continuation in part of the application filed by me on June 28, 1934, for Draft control device, Serial No. 732,810.

In the drawing in which I have shown my best and most preferred manner of building my invention,

Figure 1 is a side elevation of my device.

Figure 2 is a vertical diametrical section of the air control valve.

Figure 3 is a diagrammatic face view of the air control with the diaphragm motor shown sectioned and the air feed pipe shown sectioned to illustrate the hook up of the device.

Figure 4 is a vertical diametrical section of a modified form of air control valve.

Figure 5 is a vertical section of the diaphragm motor, enlarged to clearly show the parts thereof.

In the drawing the use of the draft control device is shown controlling the air or draft allowed to enter a stoker fan so that the air may be shut down or opened up according to the fire bed, and the pressure of air required to force a draft through this bed. The fan is shown as 100 mounted onto a stoker H and with the air duct 101 used to convey the air from the fan to the fire pot of the stoker which is not shown. The air or draft control consists of a cylindrical

chamber 102 secured over the air opening of the stoker fan or blower and in this chamber there is a partition 103 having pie-shaped openings 104 therethrough. A control plate 106 is secured to said partition rotatively mounted thereto by the control shaft 105 passed therethrough and the control plate 106 is also formed with like shaped openings 107 therethrough to be brought into alignment with the openings 104 to control or shut off or open the draft through the chamber 102. The control plate 106 is provided with a weighted arm 108 which is extended out through a slot 108a in one side of the chamber 102 so that any adjustment of the plate may be made by this arm and the weight 109 normally holds the arm down and holds the openings closed. The plate 106 is rotated by the arm 108, by passing the arm through the opening 108a. The partition 103 does not rotate but is set in fixed relation to the chamber 102. The diaphragm 111, raises the link 112 which in turn raises the arm 108 and thereby partially rotates the plate 106, through the opening 108a.

A conduit 110 is connected with the air duct 101 and extends into a flexible diaphragm chamber in which a diaphragm 111 is mounted, said diaphragm being similar to that shown in Figure 5 of the drawing. This diaphragm is carried in a suitable casing and is connected with the control shaft 108 by a link 112. With this particular design of diaphragm which is somewhat changed from that shown in Figure 3, the port d is connected to the air conduit 110 and the long bolt carried in the spacer sleeve shown at the side of the chamber may be used to support the diaphragm chamber from the side of the air conduit or from a bracket support extended from the side of the air conduit, (not shown).

The particular type of flexible power diaphragm shown in Figure 5 which may be used in this invention is of a low pressure type formed of opposed concave chambers 79 and 80 secured together by stud bolts and carrying the flexible diaphragm 111 therebetween. The rod 81 is suitably positioned and set in ball bearings by forming bosses 82 and 82 on the walls of the chambers 79 and 80 and the bosses are bored larger diameter than the size of the rod 81. Onto the outside end of each boss I then provide a bearing which consists of ball bearings 85 mounted in a suitable ring 84 with the ring carried in a socket 86 in a ring block 87 which ring blocks, there being two used, are secured onto the ends of the bosses and which ring blocks are

centrally bored to receive the shaft or rod 81, but of larger diameter than the rod to prevent the rod from touching anything in the device other than the balls 85.

- 5 The opening *e* is shown closed by a plug which may be removed if quick action of the diaphragm is desired to prevent any compression of air in the chamber 79.

In Figure 4 of the drawing the cylindrical casing of the device is shown as J with the end 120 closed and within this casing I provide a similar shaped valve cylinder 121 having its end closed and fitting adjacent the closed end of the cylinder J, and a center rotative pivot pin 122 provides means of holding the two cylinders together. The control feature is then made by having openings 123 in the casing J and like shaped openings 124 in the cylinder 121 adapted to be brought into alignment by rotating the inner casing by an arm 125 extending out through a slot 126 in the side of the cylindrical casing J. This arm is then connected with the arm 112 of the diaphragm or with the desired source of power to rotate the inner valve cylinder to open or close the ports through the cylinder J.

With this type of device the same motion is used, but the air enters through ports in the side of the casing rather than through the end.

- 30 Having thus described my invention, I desire to secure by Letters Patent and claim:

1. In an air control device of the class described, the combination of a fan inclosed in a fan housing to force air through an air conduit for forced draft; a casing mounted on said fan housing enclosing the openings into said

housing; a partition in said casing having openings therethrough; a rotatively mounted control plate having like formed openings to those in the partition, said plate being mounted rotatively to said partition; an arm extending out through a slot in one side of said casing from said control plate; a pipe connecting the air conduit with an enclosed diaphragm chamber; a diaphragm mounted in said chamber; and means to connect said diaphragm with said arm to control the opening or closing of the control plate by the pressure in the air conduit.

2. In an air control device of the class described, the combination of a fan enclosed in a fan housing; an air duct connected with the discharge end of said fan housing; a casing mounted over the intake opening of said fan, having a partition therein said partition having openings therethrough; a control plate mounted in said casing adjacent said partition, said plate being centrally mounted to permit partial rotation thereof to control the openings in said partition by like shaped openings in said plate; an arm attached to said control plate and extended out through a slot in one side of said casing; a weight adjustably carried on said arm to vary the pressure required to actuate said control plate; a link connected to the end of said arm; a diaphragm mounted on the end of said link; a diaphragm chamber surrounding said diaphragm; and a conduit connecting the diaphragm chamber with the air duct to control the amount of opening of said air intake commensurate with back pressure in the conduit.

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