

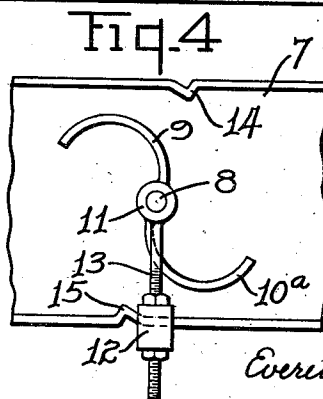
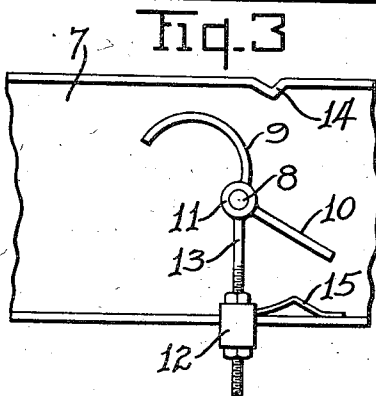
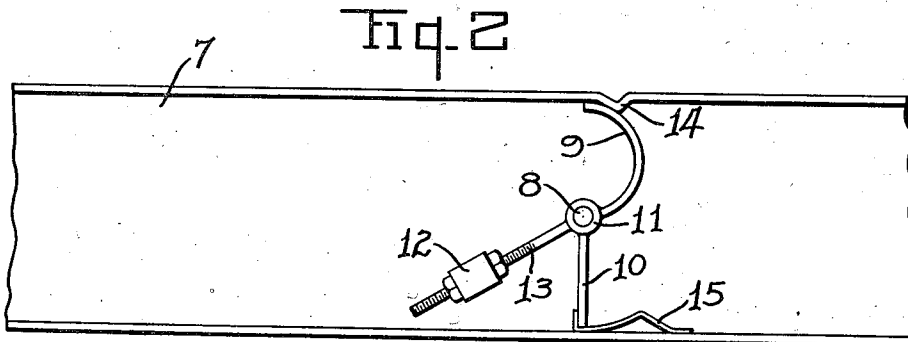
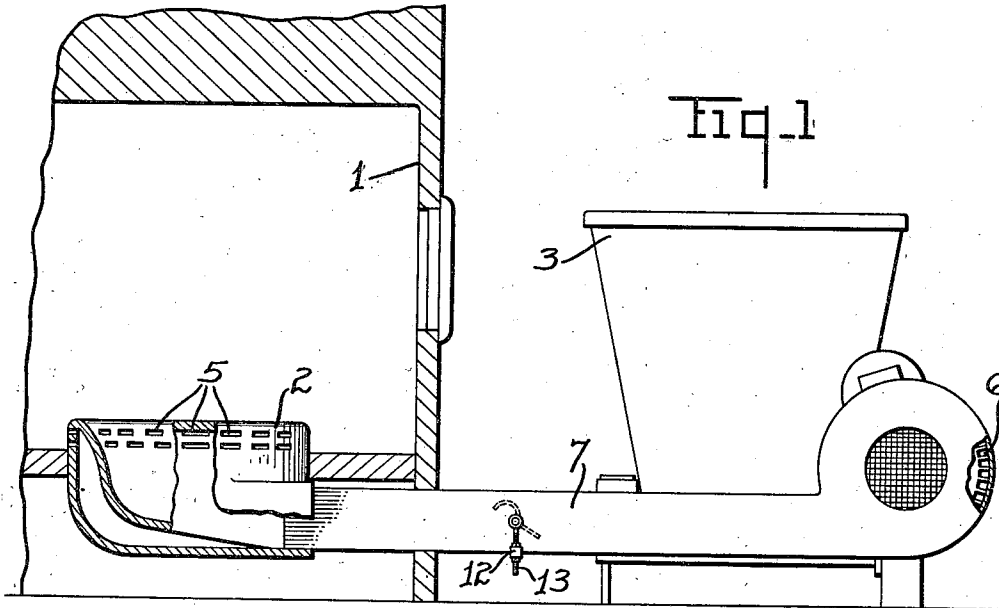
Aug. 6, 1935.

E. B. JONES

2,010,694

AIR FEED CONTROL MEANS

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UNITED STATES PATENT OFFICE

2,010,694

AIR FEED CONTROL MEANS

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Application July 16, 1934, Serial No. 735,311

3 Claims. (Cl. 137—152)

This invention relates to air feed control means for automatic stokers.

In the use of automatic stokers, particularly for household heating, it is found that in mild weather the coal feed necessary to maintain the desired room temperature is small. This light, intermittent feed permits the fire to burn down and thin out the bed of coal in the furnace. On resumption of operation, this reduced bed does not offer the same resistance to the forced draft as would a full bed of fuel. The tuyères may even be partially uncovered, so that a greater volume of air passes through the fire than is desirable. This excess air carries dust with it and also causes extremely rapid combustion in areas immediately adjacent the tuyères, resulting in burned out spots in the fire. It is desirable for these reasons to provide some means to regulate the air flow in accordance with the resistance offered by the fuel bed so that, regardless of the condition of the fire, the volume of air blown in will be the required amount for proper combustion.

The primary object of the invention is the provision of an automatic means to regulate the volume of air fed into the combustion chamber of a furnace equipped with an automatic stoker.

Another object of the invention is the provision of a device of this character which is regulable for any predetermined range of operation.

Still another object of the invention is the provision of such a device which is inexpensive to manufacture, simple and efficient in operation, and easy to install and which will not deteriorate during its use.

Other objects and advantages of the present invention will become apparent as the description proceeds, reference being had to the accompanying drawing in which two embodiments of the invention are disclosed and in which—

Figure 1 is a side elevation, with parts in section, of a stoker in which the air feed is controlled by the present invention; Fig. 2 is a fragmentary side elevation of the air conduit in which the device is placed, one side of the conduit being removed, the device being in its extreme closed position; Fig. 3 is a view similar to Fig. 2, with the device in its open position; and Fig. 4 is a similar view of a modified form of the device.

Referring to the drawing, 1 designates a furnace in which a fire pot 2 of an automatic stoker is placed. The stoker forms no part of the present invention and hence will be but briefly de-

scribed. A coal hopper 3 is adapted to contain coal to be fed into the fire pot through any suitable coal tube, not shown.

Tuyères 5 are formed in the fire pot so that air to support combustion of the fuel may be forced into the furnace. The source of air supply is a fan 6 which blows air into an air conduit 7 and thence around the fire pot through the tuyères.

The device provided by the present invention is located in the air conduit 7 intermediate its ends and comprises a damper member pivoted on a transverse central shaft 8. The damper member is formed by two opposed blades 9 and 10 mounted on a common hub 11, which blades offer unequal resistance to the flow of air through the conduit. In the preferred form the top blade 9 is semi-cylindrical and convex in the direction of the source of air supply, while the lower blade 10 is a flat plate. It will be understood, of course, that the blades extend substantially the entire width of the air conduit 7.

Normally the blades are held in the open position illustrated in Fig. 3 by any suitable means such as a weight 12 adjustably carried on an angularly disposed arm 13 attached to the hub 11 of the blade assembly. It will be seen that gravitation of the weight 12 causes a rotation of the blades to open position.

Stop members 14 and 15 are disposed within the air conduit 7 to limit the movement of blades.

In the modification shown in Fig. 4 the lower blade, here designated 10*, is made semi-cylindrical similar to the upper blade 9 but with its curvature in the direction of air flow and opposed to the curvature of the upper blade 9.

In operation, the velocity of air flowing into the furnace through the air conduit 7 depends on the resistance offered by the bed of fuel. Obviously if this resistance is low due to a burned down fire, the volume of air which can pass through the tuyères under a given pressure is greater and the velocity in the air conduit 7 consequently increases in proportion. Thus the force acting on the lower blade 10 tending to rotate the damper to the position shown in Fig. 2, increases while the resistance to this rotational movement offered by the curved upper blade 9 does not increase as much due to its curved surface. It will be seen that rotation of the blades closes off a portion of the air conduit 7, thus reducing the volume of air flowing to the tuyères. The rotation of the damper is opposed by the weight 12 which tends to assume its lowermost position. The force tending to restore the

weight, and hence the damper to the open position of Fig. 3 increases as the weight moves up and the effective lever arm lengthens. However, as the damper rotates, the lower blade 10 becomes more nearly normal to the direction of air flow and hence offers greater resistance and more rotational force.

By moving the weight 12 up or down on the arm 13 the effect of the weight can be increased or decreased so that a greater or less air velocity will be required to move the damper to a given position.

The operation of the form shown in Fig. 4 is apparent from the above, the only additional advantage of this form being the increased resistance offered by the curved lower plate 10^a over the flat plate.

Obviously other modifications and changes may be made in the form and disposition of the parts without departing from the invention as defined in the appended claims.

What I claim is:—

1. A device for supplying air to the combustion chamber of a furnace, including an air conduit having one end extending into the furnace and having its opposite end connected to a source of forced air supply, and means to regulate the volume of air flow in the conduit according to the velocity of the air, said means being located between the ends of the conduit and including a pivoted damper disposed in the conduit, having opposed blades one of which is substantially semi-cylindrical and has its convex side confronting the air supply from said source, whereby to lessen the resistance thereof to the air stream when the latter is directed against the blades, means normally urging the damper to open position, and a pair of stops in the conduit one for each blade to hold the blades in closed position.

2. A device for supplying air to the combustion chamber of a furnace, including an air conduit having one end extending into the furnace and having its opposite end connected to a source of forced air supply, and means to regulate the volume of air flow in the conduit according to the velocity of the air, said means being located between the ends of the conduit and including a pivoted damper disposed in the conduit, having opposed blades for confronting the air stream from said supply, one of said blades being flat and the other being substantially semi-cylindrical in form, the convex surface of the latter blade being disposed to be presented to the force of the air stream whereby to lessen the resistance thereof to the air stream when the latter is directed against the blades, means normally urging said damper to open position, and opposed stops in the conduit, to limit movement of the latter when in closed position.

3. Means to regulate the volume of air flow to the combustion chamber of a furnace having an air conduit, one end of which latter is connected to the furnace and the other end of which conduit is connected to a source of forced air supply, including a damper, means to pivotally mount the damper in an air conduit, said damper having opposed blades for confronting the air stream from said supply, one of said blades being flat and the other being substantially semi-cylindrical in form, the convex surface of the latter blade being disposed to be presented to the force of the air stream when the latter is directed against the blades, means normally urging said damper to open position, and a stop for each of the blades for securement within the conduit to limit movement of the blades when in closed position.

EVERETT B. JONES.

CERTIFICATE OF CORRECTION.

Patent No. 2,010,694.

August 6, 1935.

EVERETT B. JONES.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 2, second column, line 18, claim 2, after "conduit," insert the words one for each of the blades; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 17th day of September, A. D. 1935.

(Seal)

Leslie Frazer
Acting Commissioner of Patents.