July 30, 1929. R. E. KELM 1,722,801

DRAFT REGULATOR

Filed Jan. 6, 1927

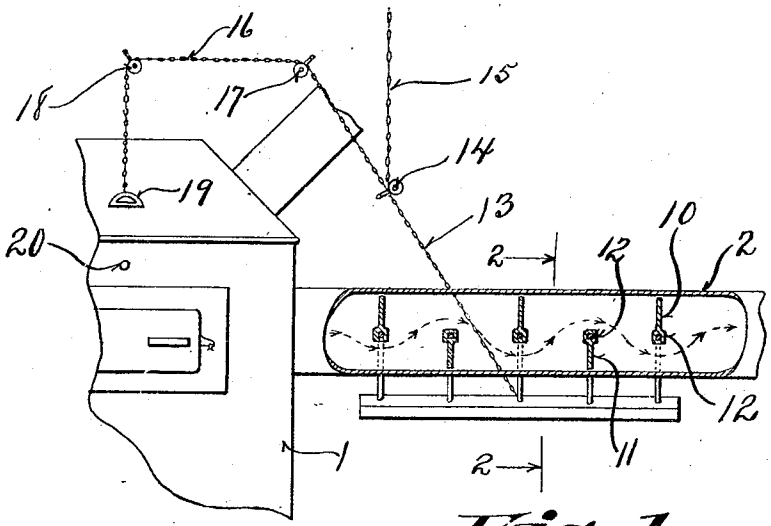


Fig. 1

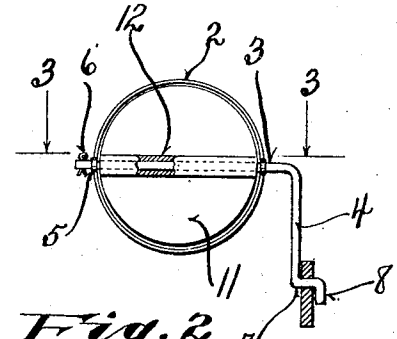


Fig. 2

Fig. 3

Inventor
Richard E. Kelm
By
Attorneys

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UNITED STATES PATENT OFFICE.

RICHARD E. KELM, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO AMERICAN HEAT PRESERVER CO., OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

DRAFT REGULATOR.

Application filed January 6, 1927. Serial No. 159,332.

This invention relates to an improved draft regulator which is especially adapted for use in the smoke pipes or flues of furnaces or other heating devices of this type.

Objects of this invention are to provide a novel form of draft regulator which may be set at any desired point, which is self-restoring, and which causes the hot gases to alternately sweep towards the upper and lower portion of the smoke pipe to thus control the flow in a novel manner.

More specifically, objects of this invention are to provide a draft regulator in which a plurality of half damper sections are employed and simultaneously operated, each of the half damper sections having a thickened portion where it joins the transverse rocking shaft, the damper mechanism being so constructed that there is no likelihood of burning out of any of the parts exposed to the heat of the gases.

An embodiment of the invention is shown in the accompanying drawings in which:

Figure 1 is a sectional view through the device showing it in position in a smoke pipe;

Figure 2 is a transverse sectional view on the line 2—2 of Figure 1;

Figure 3 is a perspective view partly in section with the section corresponding to that indicated by the line 3—3 in Figure 2.

Referring to the drawings, it will be seen that a furnace 1 has been indicated as provided with a smoke pipe 2. This smoke pipe carries a plurality of transversely projecting bars 3 which are equipped with downwardly extending portions 4 forming rock arms or levers. The bars 3 are square in cross section and are pivotally carried within the smoke pipe 2 in any suitable manner. For example, small washers or collars 5 may surround the bars at the points where they pass through the smoke pipe. The outer ends of the bars carry split pins 6 to prevent their inadvertent withdrawal.

The lower ends of the levers 4 are provided with portions 7 bent outwardly at right angles and then downwardly, as indicated at 8. A connecting weighted bar 9 joins all of the levers and is provided with apertures for the reception of the portions 7. In positioning this bar, it is a simple matter to turn it into a horizontal position and slip it upwardly with the portions 8 passing through the apertures. Thereafter, the bar is turned into a vertical position and slipped over the portions 7 of the levers. This provides a novel and simple means of pivotally joining the bar to each of the levers and avoids the use of auxiliary apparatus for holding the bar in place. Each of the rock shafts or bars 3 carries a half damper section. These half damper sections are of identical construction and are indicated by the reference characters 10 and 11. It is to be noted that the half damper sections are turned in opposite directions alternately so that the series indicated by the reference character 10 projects upwardly, while the series indicated by the reference character 11 projects downwardly. These half damper sections are cast, and are provided with a thickened portion adjacent the part which receives the bars 3. This thickened part is indicated by the reference character 12, and is provided with a rectangular aperture for the reception of the rectangular shafts or bars 3. This provides a secure attachment between the bars or shafts 3 and the half damper sections, and at the same time, locks the half damper sections to the rods or shafts, so that the dampers are locked with the rods and no slipping can occur. The path of the heated gases is indicated by the dotted arrows in Figure 1, and it will be seen that they first turn downwardly, thence upwardly, and so on through the device. The position of the parts shown in Figure 1 is that occupied under normal conditions, and it is to be noted that the draft is not constricted to such a point as to prevent adequate and perfect combustion of the fuel with consequent smouldering of the fire, but is such as to permit a proper burning under all conditions. It is also apparent that the draft can be materially increased by rocking the levers simultaneously to thus move the dampers into a horizontal position and allow free passage of the gases. This may be accomplished in numerous ways. For example, a chain or flexible connector 13 is attached to one of the levers 4, preferably the center lever, as indicated. This connector passes over a pulley 14 and extends upwardly, as indicated at 15, into the house. Further, it will be seen that a chain 16 extends over pulleys 17 and 18 and its free end projects downwardly adjacent the front of the furnace. This free end is provided with a hand loop 19 which may be hooked over any suit-

able projection, as indicated at 20, during firing or when it is desired to get a quick increase in draft. The hand lever is only temporarily hooked over the pin, as the normal position of the parts is as shown in Figure 1.

It is to be noted particularly from reference to Figure 2 that the center line and consequently the center of gravity of the bar 9 is below the portions 7 of the shafts, so that the bar will hang down in the position shown in Figure 2, and will have no tendency to rock about the portions 7.

It will be seen that a very simple type of draft regulator has been provided, and it will be seen further that there is no danger of burning away of the parts of the draft regulator due to the heated gases either from the heat of the gases or from any chemical action thereof. The reason for this is that there is no frame or delicate part positioned within the smoke pipe and that the center edges of the half damper sections over which the hottest gases pass is thickened so as to resist the action noted above.

It will be seen further that the device is self-restoring and does not require auxiliary weighted chains and other devices of this type.

Although the invention has been described in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed.

I claim:

1. The combination of a furnace having a horizontal, circular smoke pipe, a draft regulator positioned within said smoke pipe and comprising a plurality of transversely extending shafts, a plurality of half circular damper section rigidly mounted upon said shafts and extending alternately in opposite directions, said shafts projecting outwardly through said smoke pipe and having downwardly extending external lever portions, and a connecting bar joining the lower ends of all of said lever portions, said connecting bar being of sufficient weight to insure the restoration of the dampers after they have been displaced, said dampers being arranged to cause a sinuous flow of the gases in the smoke pipe, said shafts being of rectangular cross section, and said half damper sections having thickened center hub portions provided with rectangular apertures for the reception of said shafts, whereby those portions extending into the smoke pipe are completely housed, means for shifting said connecting bar, and collars carried by said shafts at the point where the shafts pass through the smoke pipe, said collars bearing against the smoke pipe and supporting said shafts.

2. The combination of a horizontal smoke pipe, a draft regulator associated with said pipe and comprising a plurality of half damper sections positioned within said pipe, a plurality of shafts passing through said pipe and extending through said half damper sections, said shafts having downwardly projecting arms located externally of said pipe and having outwardly and downwardly turned ends, and a metal bar having a plurality of aperatures receiving the outwardly turned portions of the said arms and having its center of gravity located below the outwardly turned portions of such arms.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

RICHARD E. KELM.