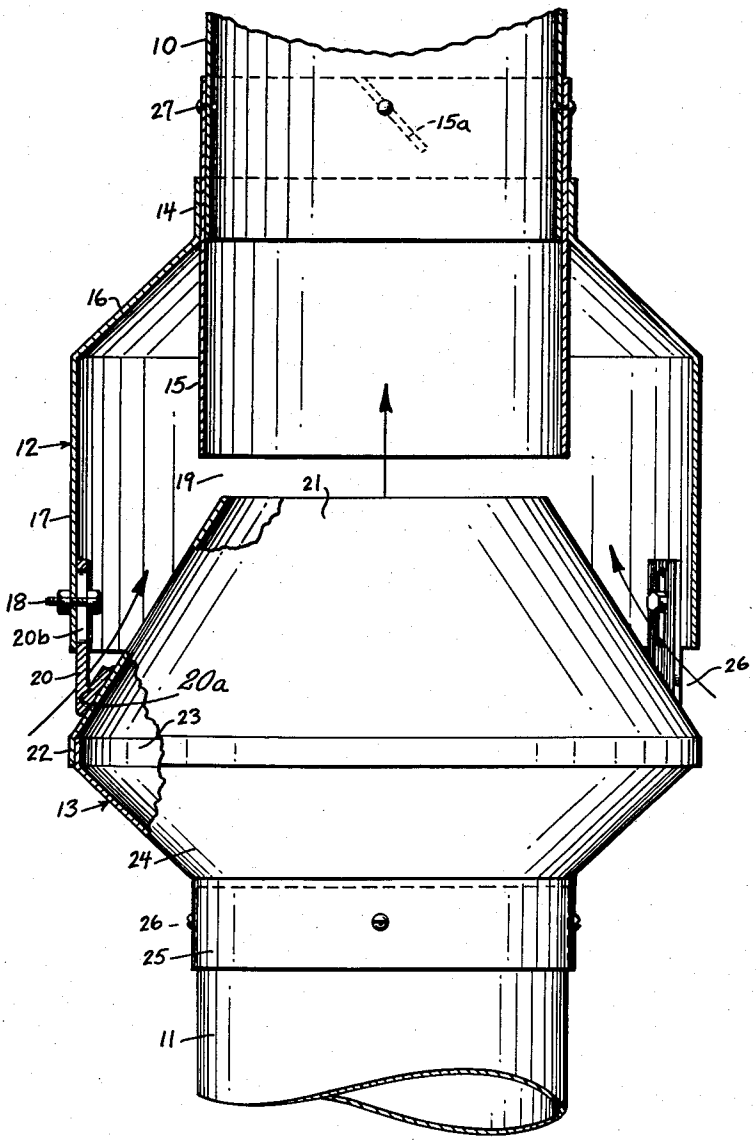
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ADJUSTABLE DRAFT REGULATOR

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ADJUSTABLE DRAFT REGULATOR

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The present invention relates to an adjustable draft regulator of the hood type for furnace flue pipes, and more particularly to one which functions both as a draft compensator and a down draft diverter.

Regarding the draft compensating function of my draft regulator, the object is to provide a readily adjustable means for inducting outside air into the flue pipe leading from the furnace in such a manner and rate that the resulting mixture of outside air and combustion gases will cause a cooling condition in the flue pipe whereby the gas density is so increased that the flow of heat from the furnace is retarded, the burning rate of the furnace fuel is stabilized, and the combustion efficiency increased.

Continuing to the down draft diverting function of my invention, the object is to provide a means whereby when a down draft condition exists in the furnace flue pipe, proper spillage from the flue pipe automatically occurs to relieve the increased pressure so that the air supply to the furnace combustion chamber will not fluctuate responsive to down drafts, and hence combustion efficiency will not be affected thereby.

Other more particular objects and advantages of the invention will, with the foregoing, appear and be understood in the course of the following description and claims, the invention consisting in the novel construction and in the adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawings the single figure is a side elevational view partly in vertical section of a preferred embodiment of my invention.

Referring to the drawing it is seen that alined upper and lower flue pipe sections 10—11, leading to the chimney and from the furnace, respectively, are spaced apart to carry therebetween outlet and inlet units 12—13 of sheet metal construction. The outlet unit 12 has an upper collar 14 slidably mounted on a sleeve 15 which is in turn adjustable along and depends from the upper flue pipe 10 to define by its lower depending end a variable gap 19 with the upper end of the lower unit 13. From its collar 14 the outlet unit 12 flares downwardly at a frustro-conical portion 16 to a cylindrical skirt or hood 17. This skirt projects below the sleeve 15 and is secured by bolts 18 to circumferentially spaced brackets 20 having bottom terminal feet 20*a* welded to the inlet unit 13 near the base of a frustro-conical egress portion 21. The latter has a cylindrical base rim 22 which interfits with a mating rim 23 at the top of an inverted frustro-conical ingress portion 24. A collar 25 completes the inlet unit and is secured as by screws 26 on the lower flue pipe section 11. It will be noted that the brackets 20 are formed with longitudinal slots 20*b* to adjustably receive the bolts 18 so that the gap 26 between the skirt 17 and the inlet unit 13 can be easily varied. The sleeve 15 is in turn secured above the collar 14 to the upper flue pipe section 10 as by rivets 27. Diagonal slots 15*a* can be provided along the sleeve for ready adjustment of the gap 19. The upper egress end of the lower unit 13 is preferably smaller in diameter than that of the sleeve 15. With this arrangement the combustion gases from the furnace will be directed into the sleeve 15 to continue up the flue pipe. This directing is aided by the taper of the egress portion 21 but the primary purpose

of this taper and the reduced upper end of the inlet unit is to divert downdrafts so that they will spill out through the gap 26 to the atmosphere rather than surging into the combustion chamber of the furnace. Of considerable importance is the fact that the interfitting frustro-conical portions 21, 24 of the lower unit 13 collectively form an expansion chamber which evens the flow of the combustion gases by dampening the effects of variances in updraft conditions. The expansion chamber also dampens any unusual downdraft surges which might exceed the spillage capacity of the gaps 19, 26. Such surges are also dampened by way of the fact that the skirt 12 also defines an expansion chamber when considered with the depending portion of the sleeve 15 and the shrouded portion of the diverter wall 21. Also, of considerable importance is the fact that the upper diverter wall 21 of the expansion chamber is cooled by the flow of atmospheric air which is drawn through the gap 26 and flows therealong through the gap 19 into the sleeve 15. This cooling effect on the expansion chamber and the additional direct cooling of the combustion gases by the educted air upon merging therewith at the bottom of the sleeve 15 causes an increase in the density of the gases in the flue pipe and thereby retards the flow of heat from the furnace. The further effects of the expansion chamber provided by the parts 21, 24 and the spillage of downdrafts prevent fluctuations in the oxygen supply to the combustion chamber and therefore stabilize the burning rate of the particular flue used by the furnace.

The adjustment of the sleeve 15 and/or the skirt 17 relative to the inlet unit 13 permits a fine setting to be easily made at the time of installation of the regulator or readily modified thereafter without disturbing the flue pipe sections 10—11. Thus the requirements for various installations of a given flue pipe size can be met by a single prefabricated regulator made in accordance with my invention.

It is believed that the invention will have been clearly understood from the foregoing detailed description of my now-preferred illustrated embodiment. Changes in the details of construction may be resorted to without departing from the spirit of the invention and it is accordingly my intention that no limitations be implied and that the hereto annexed claims be given the broadest interpretation to which the employed language fairly admits.

What I claim is:

1. In a draft regulator for insertion between alined sections of a flue pipe, an outlet unit having a generally cylindrical skirt necked to an egress collar, a sleeve adjustable endwise within said collar and adapted to interfit with a flue pipe section, and an inlet section having an intermediate expansion chamber defined at one end by a frustro-conical diverter wall which narrows to a diameter smaller than that of said sleeve and which is spaced from and partly overlapped by said skirt, said inlet unit having an ingress collar adapted to interfit with a flue pipe section.

2. The structure of claim 1 in which adjustable brackets interconnect and aline said inlet and outlet units.

References Cited in the file of this patent

UNITED STATES PATENTS

906,822	Rotermundt	Dec. 15, 1908
2,030,205	Green	Feb. 11, 1936
2,030,825	Pembroke	Feb. 11, 1936

FOREIGN PATENTS

136,626	Great Britain	Dec. 17, 1919
288,380	Great Britain	Apr. 10, 1928
526,236	Great Britain	Sept. 13, 1940