Aug. 24, 1954 H. L. PUFFER 2,687,256

DRAFT REGULATOR FOR STOVE PIPES AND THE LIKE

Filed Jan. 27, 1951

Fig. 1

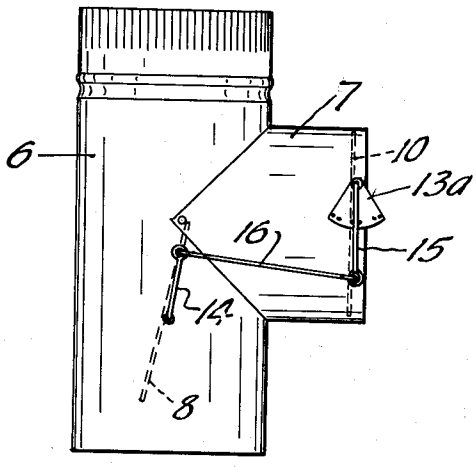


Fig. 2

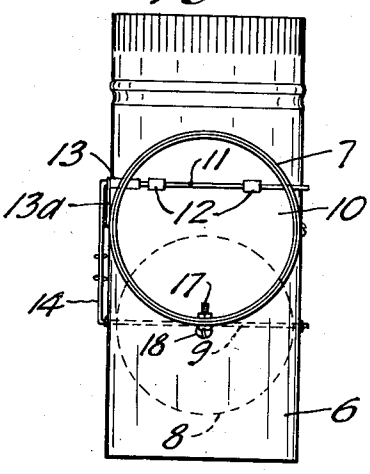


Fig. 3

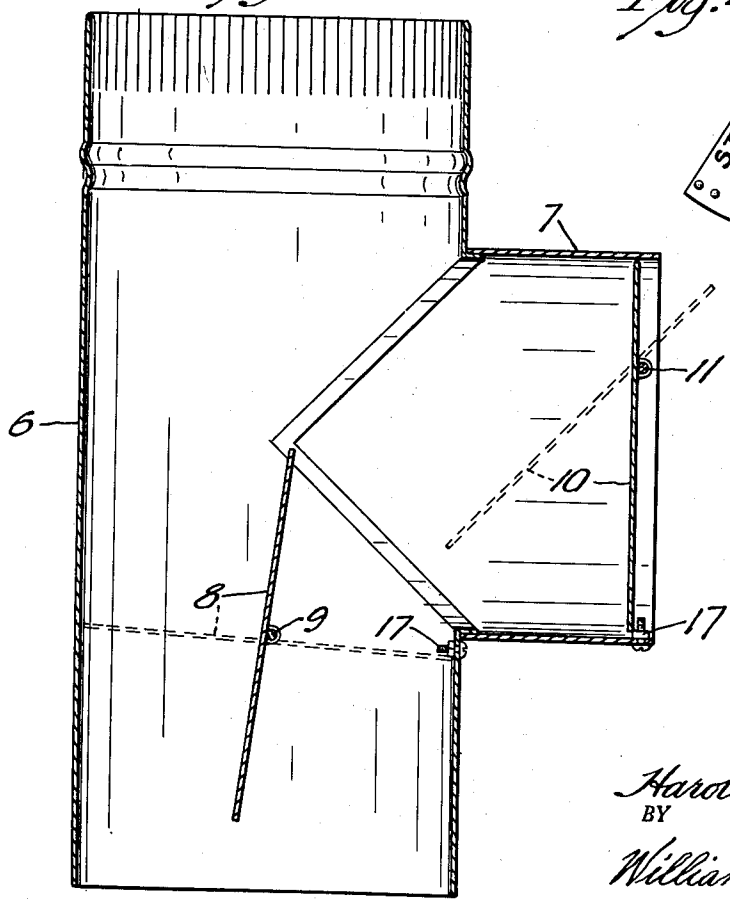
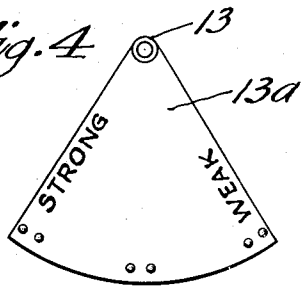


Fig. 4



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DRAFT REGULATOR FOR STOVE PIPES AND THE LIKE

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2 Claims. (Cl. 236—45)

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This invention relates to an automatic draft regulator for chimneys.

It is possible by maintaining a constant draft in the chimney of a unit heater such as a circulating heater to adjust the burner to produce an optimum fire and produce complete combustion of the fuel and eliminate the formation of soot. It is also necessary to provide a draft regulator for such unit heaters to prevent explosions under extreme conditions.

It is an object of my invention to provide an adjustable automatic draft regulator which will maintain a substantially constant stack draft for unit heaters and the like.

More specifically, it is an object to provide a pair of interconnected damper valves, one controlling the flow of air from the room directly to the stack and the other controlling the updraft through the stack to produce a substantially constant updraft from the firepot into the stack.

Still more specifically, it is an object to provide a stack damper for controllably obstructing the gas flow through the stack and a control damper interconnected with said stack damper and swingably mounted to permit the flow of air from the room to enter the stack above the stack damper to relieve excessive updraft pressures while simultaneously restricting the flow of gases upwardly through the stack by causing swinging movement of the stack damper.

These and other objects and advantages of the invention will more fully appear from the following description made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the several views, and in which

Fig. 1 is a side elevational view of my improved draft regulator as mounted in a conventional stove pipe;

Fig. 2 is an end elevational view thereof;

Fig. 3 is a vertical sectional view showing the stack damper in fully opened position and the pressure releasing damper in fully closed position by full lines, and by dotted lines showing the stack damper in completely closed position with the pressure releasing control damper in at least partially open position; and

Fig. 4 is an elevational view of the adjustment indicator.

As illustrated in the accompanying drawings, I provide a stove pipe 6 adapted to be connected to the exhaust outlet of a unit heater such as a circulating heater. The stove pipe 6 is provided with a draft releasing section 7 intersecting the same at right angles thereto in the form shown

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and affording communication between the air in the room in which the pipe 6 is located and the interior of said stove pipe. A draft restricting stack damper 8 is in the form shown fixed to a substantially horizontally disposed pivot shaft 9 which is journaled in horizontally opposed apertures formed in the pipe section 6 and is disposed slightly below the lower extremity of horizontal sections 7. A control and draft releasing damper 10 is mounted on a shaft 11 disposed along a cord of the circular damper 10 which, in the form shown, is located at a distance below the upper edge of said damper equal to one-fourth of the diameter thereof. This distance, of course, could be varied by weighting certain portions of the control damper 10. The connection between the shaft 11 and the damper 10 is constructed to frictionally resist relative oscillation therebetween by provision of suitable means such as the tabs 12 which are fixed to the damper 10 and frictionally engage the shaft 11. An adjustment indicator 13 is fixed relative to the damper 10 and frictionally embraces the shaft 11 in a manner similar to the tabs 12 and has an indicator panel 13a disposed outside the pipe section 7 to permit easy viewing thereof. The shafts 9 and 11 each have a crank arm 14 and 15 respectively fixed thereto and an actuating link 16 interconnects said crank arms as best shown in Fig. 1. A pair of stop elements 17 and 18 respectively limit the swinging movement of the two dampers 8 and 10.

The following is a description of the operation of my improved draft regulator for chimneys. Whenever the updraft through the stove pipe 6 exceeds a predetermined velocity, thereby exerting more than a predetermined vacuum on control damper 10, said damper 10 will swing inwardly to permit air from the room to pass into the pipe section and release this excessive updraft therethrough. As the damper 10 swings inwardly, the crank arm 15 will, of course, swing up and will push the crank arm 14 downwardly and swing the stack damper 8 toward the dotted line position shown in Fig. 3 to restrict the flow of gases upwardly through the pipe section 6. If the updraft through said section 6 is relatively steady and exceeds the predetermined desired draft, the damper 10 will remain in inwardly swung position and will hold the restricting damper 8 in partially closed position.

The relation between the crank arm 15 and the plane of the control damper 10 may be varied by holding the indicator plate 13a and rotating the shaft 11 relative thereto against the frictional force exerted thereby and by the tabs 12. If the

updraft is extremely strong, the plate 13a will be shifted in a counterclockwise direction relative to the crank arm 15, and, of course, the crank arm 15 will be shifted clockwise relative to the plate 13a, and if the updraft is relatively weak, the crank arm 15 will be shifted in the opposite direction toward the edge indicated as "weak."

It will be seen that I have provided a highly efficient, relatively simple draft regulator for chimneys, stove pipes, and the like in which the draft through the fire pot may be maintained substantially constant regardless of the wind velocity outdoors and the outdoor temperature, by making a relatively simple adjustment. This adjustment permits the angular relation between the stack damper and the control damper to be varied and also permits the arcuate segment through which the arm 15 travels relative to the arcuate segment traveled by the crank arm 14 to be varied and thereby control the amount of swinging movement of stack damper 8 for each increment of swinging movement of control damper 10.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departure from the scope of the present invention, which, generally stated, consists in the matter shown, and described, and set forth in the appended claims.

What I claim is:

1. A draft regulator for stove pipes and the like comprising a generally cylindrical stove pipe section having an inner end adapted to be connected with a heating unit and an outer end adapted to be connected to an exhaust stack to discharge the exhaust gases outwardly through said pipe section, a substantially cylindrical draft releasing conduit intersecting an intermediate portion of said pipe section, a generally circular stack damper diametrically journalled in said section for oscillation on a diametrical axis disposed between the connection of the pipe section with the heating unit and the intersection of said draft releasing conduit with said stove pipe section, a generally circular control damper eccentrically journalled in said conduit for oscillation on an axis disposed along a chord thereof, a pair of operating crank arms respectively fixed to said dampers and disposed exteriorly of said pipe section and said conduit, an interconnection

link pivotally interconnectig said crak arms, and stop means preventing said dampers swinging through more than 90°.

2. A draft regulator for stove pipes and the like comprising a generally cylindrical stove pipe section having an inner end adapted to be connected with a heating unit and an outer end adapted to be conected to an exhaust stack to discharge the exhaust gases outwardly through said pipe section, a substantially cylindrical draft releasing conduit intersecting an intermediate portion of said pipe section, a shaft transversely journalled in said section and extending thereacross, a generally circular stack damper diametrically fixed to said shaft for swinging movement within said section, a crank arm fixed to one end of said shaft exteriorly of said section, a transversely disposed shaft journalled in said draft releasing conduit and extending thereacross, a generally circular control damper having an adjustable frictional connection with said shaft along a chord of the damper to normally swing therewith and being disposed within said conduit, a crank arm fixed at one end of said shaft exteriorly of said conduit, and a link pivotally interconnecting said two exteriorly disposed crank arms whereby swinging movement of said control damper caused by updraft through said pipe section produces swinging movement of the stack damper, the connection between said control damper and the shaft frictionally connected therewith permitting forcible relative rotation therebetween to vary the angular relation between said crank arm and said control damper to vary the relationship between said two dampers when in extreme open or extreme closed positions, and stop means limiting the swinging movement of said dampers to substantially 90°.

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