Dec. 22, 1931. C. E. PETERSON 1,837,581

AUTOMATIC HEAT TRAP

Filed Sept. 15, 1930

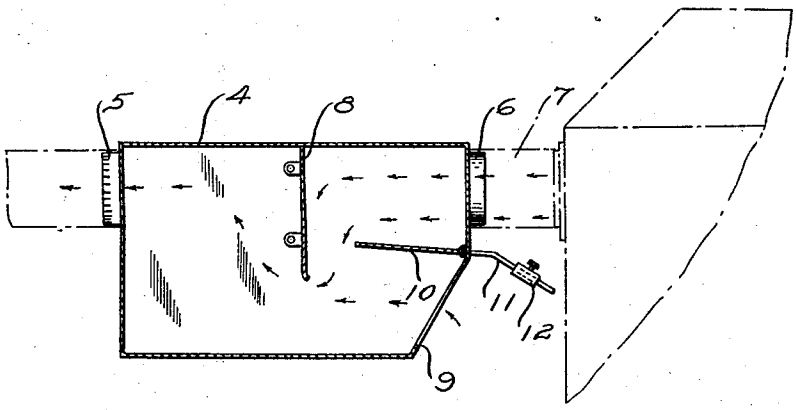


Fig. 1.

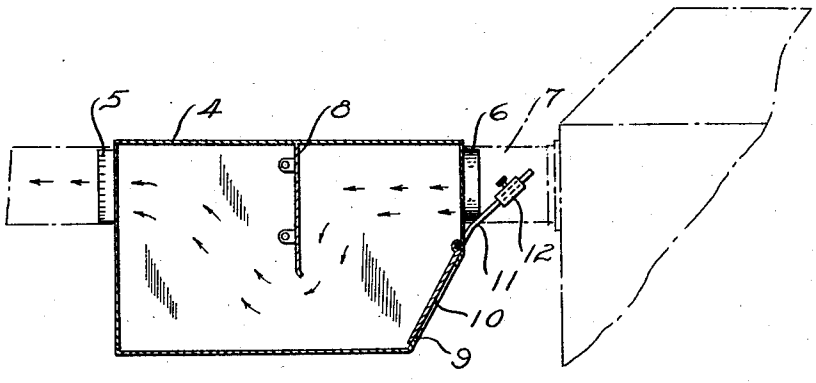


Fig. 2.

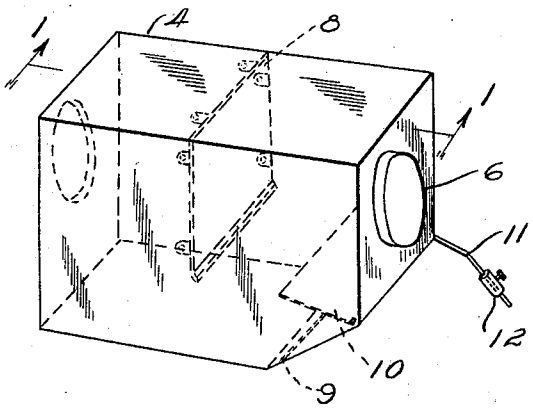


Fig. 3.

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UNITED STATES PATENT OFFICE

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AUTOMATIC HEAT TRAP

Application filed September 15, 1930. Serial No. 481,344.

My invention relates to an automatic heat trap and particularly to an automatic heat trap for heating systems using an oil burner for the generation of heat. It has been found that when an oil burner is used there is a considerable variation of pressure in the flue gases going to the stack. This is caused by reason of the fact that an oil burner generates heat very rapidly and causes a large volume of gases to be created in the smoke flue in a very much shorter period of time than is true of other types of heating apparatus. Likewise the period when no exhaust gases are being given off is very much shorter with oil than with other types of fuel. In addition to these conditions, it has been found that there is a considerable tendency for the oil to explode in the combustion chamber, particularly if the atomizer is somewhat soiled or if the oil is not sprayed on to the atomizer in the proper manner.

These various difficulties in the successful operation of an oil burning apparatus has made it necessary to have a flue running to the stack which is large enough to take care of the largest amount of exhaust gases present at any time in the combustion chamber, with the result that when the oil burner is idling or after the oil burner has ceased to run, the heat in the combustion chamber is rapidly drawn away by the action of the stack and the flue.

Attempts have been made to decrease the heat loss in oil burning apparatuses but I have found that the most satisfactory method lies in the automatic regulation of the amount of draft permitted in the combustion chamber. As will be seen, this necessitates an arrangement which will compensate for the surplus of exhaust gases under the various operating conditions as above pointed out.

It is, therefore, an object of my invention to provide an automatic heat trap for use in heating systems employing an oil burner which is inexpensive to manufacture, efficient in operation and easy to install.

These, and various other objects, features of arrangement, construction and operation, are plainly shown and described and will be best understood by reference to the accompanying drawings wherein I have shown a preferred embodiment of my invention, in which

Fig. 1 is a fragmentary view in side elevation showing my automatic heat trap in cross section with the check draft open, the dotted line figures being that of a heating plant and a smoke flue;

Fig. 2 is likewise a fragmentary view in side elevation showing my automatic heat trap in cross section, but with the check draft closed;

Fig. 3 is a view in perspective of my automatic heat trap not installed.

Referring more in detail to the drawings, 4 designates an outer shell or box provided with a collar 5 and a collar 6 for attaching to the smoke flue 7 of a heating plant. The box 4 is preferably made of sheet metal of some kind and has rigidly attached thereto and inside thereof a baffle member 8, which is preferably of heavy sheet metal or of cast iron. This baffle member is so constructed as to project downwardly into the interior of the box 4 so that the exhaust gases coming from the flue 7 into the box 4 are deflected as shown by the arrows in Figs. 1 and 2.

In the lower side of the box 4 an opening 9 is provided to allow the entrance of air into the box 4. Pivotally connected to the box 4 and adapted for closing the opening 9, is a member 10, having a projecting arm 11 carrying an adjustable weight 12.

The operation of my invention is as follows:

When my automatic heat trap has been installed in the smoke flue of a heating plant, as shown in Fig. 1, and the oil burner is in normal operation, the member 10, due to the action of the arm 11 and the counter weight 12, is caused to assume the position shown in Fig. 1. This leaves the opening 9 in the box 4 unimpaired and air is drawn into the stack at that point. The exhaust gases and heat coming through the flue 7 into the box 4 are baffled by the baffle member 8, and a counter baffle of air is likewise set up by the flow of cold air coming into the box 4 through the

opening 9. This causes an entrapping of the heat back of the baffle 8 and prevents excessive heat loss through the chimney at this time.

If, however, the oil burner has just started up, or if any of the operating conditions have occurred which cause an excess in volume or pressure of the exhaust gases in the flue 7, the increase of the pressure inside the box 4 and back of the baffle 8 is sufficient to offset the force of the arm 11 and the counter weight 12 and cause the damper 10 to assume the position shown in Fig. 2, closing off the opening 9 and allowing a clear draft from the stack through the box 4 and flue 7 to the combustion chamber of the heating plant.

The weight 12 is made adjustable on the arm 11 in order that the amount of opening of the member 10 may be controlled to compensate for the various requirements of various types and sizes of oil burners.

It will thus be seen that I have provided an automatic heat trap which is inexpensive to manufacture, efficient in operation, and easy to install.

While I have illustrated and described one embodiment of my invention, it is apparent that various changes may be made without departing from the spirit of my invention and I do not wish to be limited to the precise details of construction as herein set forth but desire to avail myself of all the changes within the scope of the appended claim.

Having thus described my invention, what I claim is new and desire to secure by Letters Patent of the United States, is:

An automatic heat trap comprising a box portion having inlet and outlet openings, a baffle disposed in said box between said inlet and outlet openings, an opening adjacent said inlet opening and disposed below said baffle, means for closing said opening comprising a member pivotally mounted, an arm secured to said member, a weight on said arm and movable relative thereto whereby said means for closing said opening is normally held in open position, and is automatically closed when there is an excess pressure of the gases in the stack.

In witness whereof, I hereunto subscribe my name this 14 day of July, 1930.

CLARENCE E. PETERSON.