Sept. 13, 1932. A. H. KLAHN 1,876,962

AUTOMATIC OPENING AND CLOSING FURNACE DOOR FOR AUTOMATIC OIL BURNERS

Filed April 6, 1929

Fig. 1.

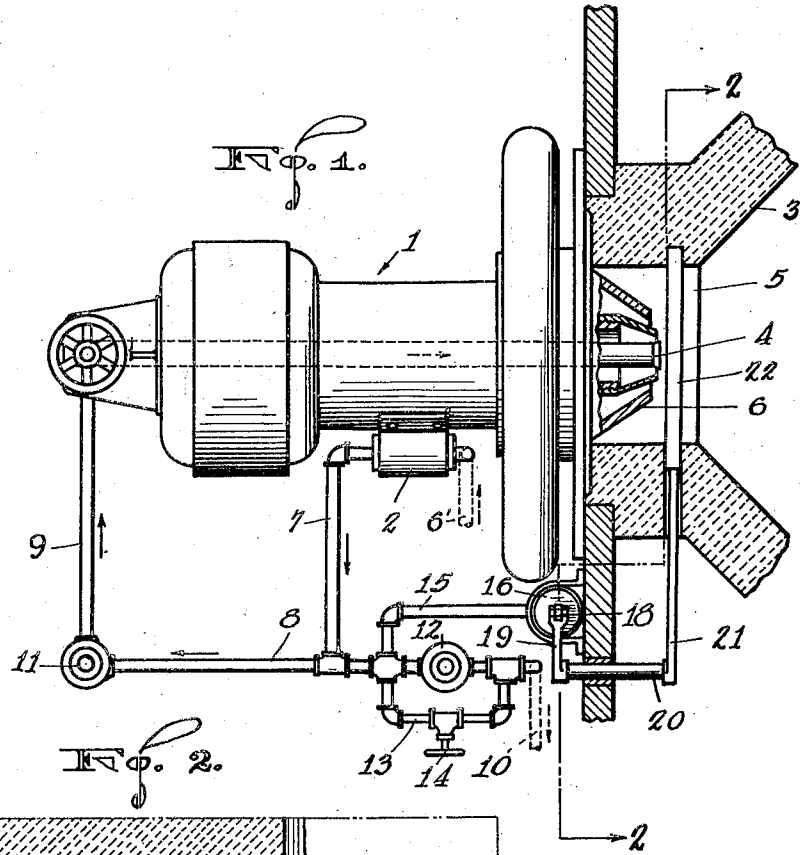


Fig. 2.

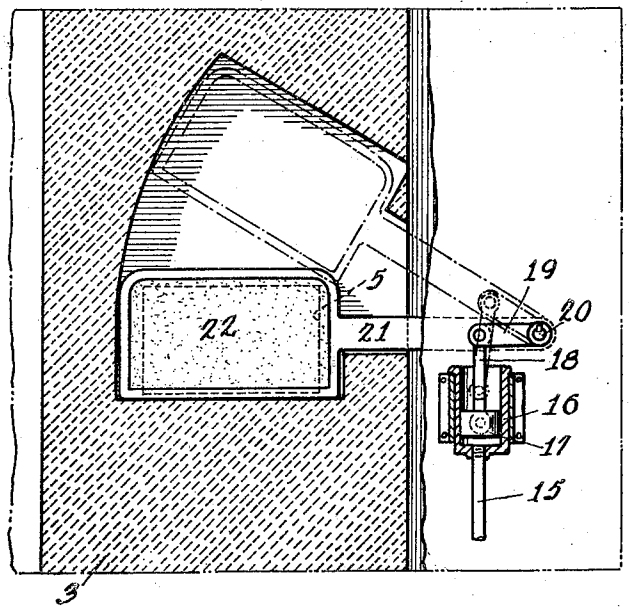
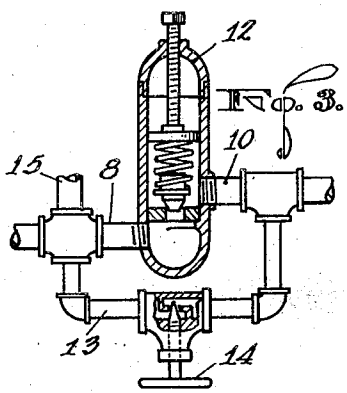


Fig. 3.



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AUTOMATIC OPENING AND CLOSING FURNACE DOOR FOR AUTOMATIC OIL BURNERS

Application filed April 6, 1929. Serial No. 353,137.

My invention relates to improvements in automatic opening and closing furnace doors for automatic oil burners, and it consists in the combinations, constructions and arrangements hereinafter described and claimed.

In the standard type of automatic oil burner, the oil atomizer projects a slight distance into the furnace. So long as the burner functions, practically all of the oil is burned. Each time the burner is stopped, a few drops of oil flow to the rim of the oil atomizer. The heat within the furnace is at a very high temperature, and is sufficient to carbonize the oil on the atomizer. In time, a ring of carbon is built up upon the rim of the atomizer, and it is necessary to remove this carbon before the device will function efficiently.

The principal object of my invention is to automatically move a heat-resisting shield between the furnace and the burner so as to prevent the intense heat within the furnace from carbonizing the oil on the burner. This shield is automatically moved away from the furnace door opening when the burner starts functioning. In this way the heat-resisting shield needs no attention from an operator, but will automatically function with the oil burner.

In the present drawing I have shown the shield as being controlled by the oil pressure. It is obvious that it could be controlled by other means, and I therefore do not wish to be confined to the particular type of showing.

Other objects and advantages will appear as the specification proceeds, and the novel features will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawing, in which

Figure 1 is a schematic view of an oil burner and furnace showing my device operatively applied;

Figure 2 is a section along the line 2—2 of Figure 1; and

Figure 3 is a detail section through a part of the device.

In carrying out my invention, I make use of a standard automatic oil burner indicated generally at 1, and an oil pump 2. The burner is placed in front of a furnace 3 so that the oil atomizer 4 projects into the furnace door opening 5. A nozzle protector 6 also extends part way into the opening 5. The elements thus far described form no part of my invention except insofar as they cooperate with the elements to be described.

An oil supply pipe 6' connects with the pump 2, and a pipe 7 leads from the pump to a pipe 8. Here the oil branches off, part of it going to the burner 1 by means of a pipe 9, while the rest is returned to the tank (not shown) by means of a pipe 10. A valve 11 is placed between the pipes 8 and 9 and is set so as to require the oil within the pipe 8 to attain a certain pressure before it can pass into the pipe 9, for example, a pressure of fifteen pounds. A valve 12 (see Figures 1 and 3) is placed between the pipe 8 and the pipe 10 and is adjusted so that oil will have to reach a pressure of say twenty-five pounds before it will flow through the pipe 10 and back to the storage tank.

My invention comprises a by-pass pipe 13 that carries a portion of the oil from the pipe 8 to the pipe 10 without having this oil pass through the valve 12. A regulating valve 14 (see Figures 1 and 2) is disposed in the by-pass 13 and controls the amount of oil flowing through the by-pass.

A pipe 15 leads from the pipe 8 to a cylinder 16 (see Figure 2). A piston 17 is mounted in the cylinder and is connected by a link 18 to an arm 19. The arm in turn is carried by a shaft 20 and carries a second arm 21 that supports a heat-resisting door 22 made of asbestos or other suitable material. The door is swingable from a position covering the opening 5 into a position above the opening, as shown by the dotted lines in Figure 2.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood.

As soon as the burner starts functioning, oil is forced into the pipes 7, 8, 13 and 15. The valve 11 controls the amount of oil passing from the pipe 8 into the pipe 9. The valve 14 controls the amount of oil by-passing the valve 12. The amount of oil is exceedingly

small so as to not overwork the pump 2 in merely forcing oil through the by-pass. The valve 12 causes the oil within the pipe 8 to reach a pressure of twenty-five pounds, for example, before it will open and permit the oil to flow into the pipe 10. This pressure of oil builds up in the pipe 15 and in the cylinder 16, thus causing the door to swing open. So long as the pump functions, the oil within the cylinder will keep the door 22 open.

When the burner is automatically cut off and the oil pump stopped, the oil within the pipes 7, 8 and 15 will drain through the by-pass 13. This will permit the piston 17 to lower and to move the door 22 into closed position. The door prevents the heat from the furnace from striking the oil atomizer 4, and this prevents the carbonizing of the oil on the atomizer. The door 22 will be instantly swung into open position as soon as the burner again starts to function, and this opening and closing of the door automatically takes place each time the pump 2 starts and stops functioning.

Although I have shown and described one embodiment of my invention, it is to be understood that the same is susceptible of various changes, and I reserve the right to employ such changes as may come within the scope of the invention as claimed.

I claim:

1. The combination with an oil burner and a source of fluid pressure therefor, of a protective shield movable into a position in front of the burner, and means controlled by the fluid pressure for moving the shield away from the burner when the burner starts operating, and in front of the burner when it stops for preventing carbonization of oil on the discharge nozzle of the burner.

2. The combination with an oil burner having an oil force feed pump, of a protective shield disposed in front of the burner when the burner is inactive for preventing carbonization of oil on the discharge nozzle of the burner, and means actuated by a portion of the oil delivered by said pump for moving said shield away from the front of the burner.

3. The combination with an oil burner, of means for delivering oil to said burner, a shield disposed in front of the burner when the latter is inactive for preventing carbonization of oil on the discharge nozzle of the burner, and oil-actuated means for moving said shield away from the front of said burner, said last-named means functioning when said oil-delivering means is actuated.

4. The combination with an oil burner, of means for delivering oil to said burner, a return pipe for carrying away the unused oil, a shield disposed in front of said burner when said oil delivery means is inactive, and oil-actuated means operatively connected to said shield for moving it away from said burner when said oil delivery means is actuated, the oil from said oil-actuated means draining into said return pipe when said oil delivery means becomes inactive, whereby said shield is returned to a position in front of the burner for preventing carbonization of oil on the discharge nozzle of the burner.

5. The combination with an oil burner, a fuel pump, a return pipe, and a valve disposed in said return pipe, of a shield swingable from a position in front of the burner to one away from the burner, a cylinder having a piston actuated by the oil delivered by said pump, connections between the piston and the shield for moving the shield away from the burner when oil is delivered to the cylinder, and a by-pass connecting the cylinder directly with the return pipe for draining oil from the cylinder and allowing the shield to return for preventing carbonization of oil on the discharge nozzle of the burner.

6. The combination with an oil burner, a fuel pump, a return pipe, and a valve disposed in said return pipe, of a shield swingable from a position in front of the burner to one away from the burner, a cylinder having a piston actuated by the oil delivered by said pump, connections between the piston and the shield for moving the shield away from the burner when oil is delivered to the cylinder, a by-pass connecting the cylinder directly with the return pipe for draining oil from the cylinder, and allowing the shield to return for preventing carbonization of oil on the discharge nozzle of the burner.

7. The combination with an oil burner and a source of fluid pressure therefor, of a protective shield movable into a position in front of the burner, and means entirely and automatically controlled by the fluid pressure for moving the shield away from the burner when the burner starts operating, and in front of the burner when it stops for preventing carbonization of oil on the discharge nozzle of the burner.

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