Oct. 28, 1941. G. C. BERGTHOLDT. JR 2,260,737

SAFETY PILOT

Filed March 22, 1940

Fig. 1.

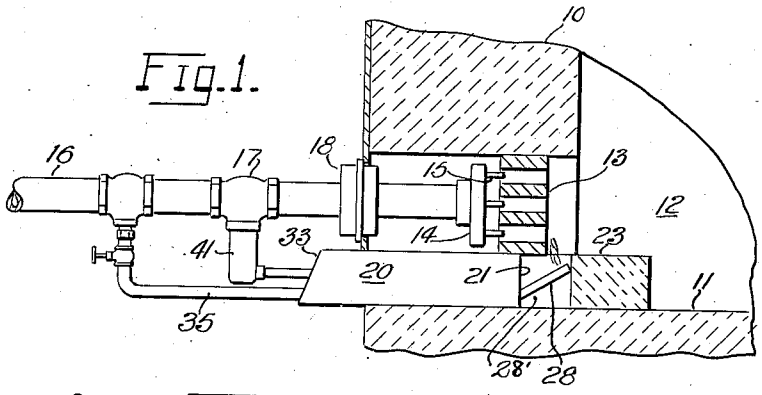


Fig. 2.

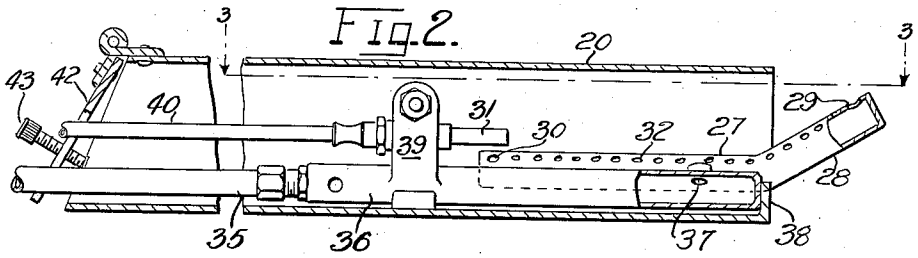


Fig. 3

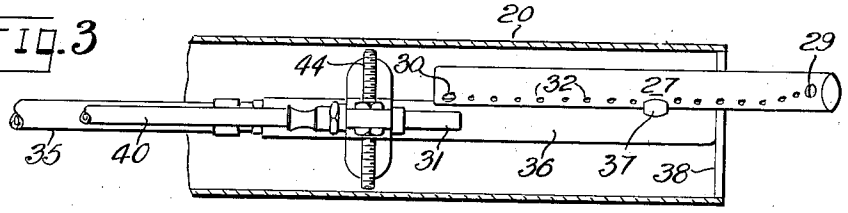


Fig. 4.

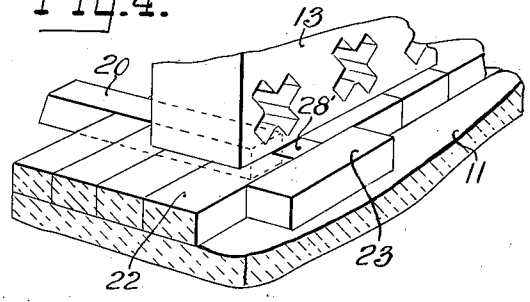
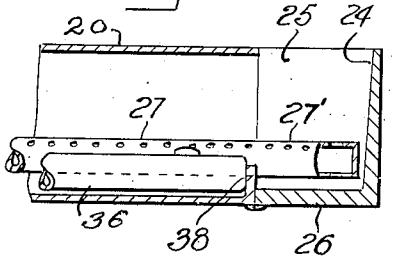


Fig. 5.



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SAFETY PILOT

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Application March 22, 1940, Serial No. 325,327

2 Claims. (Cl. 158—117.1)

The present invention has for its object to provide a safety pilot assembly that shall be particularly well adapted for use with burners such as are commonly employed for firing into the combustion chamber of a steam boiler furnace, the customary location of such burners being in a side wall of the chamber near the bottom thereof.

Due to the location of the burner it has heretofore been a difficult matter to provide a safety pilot that could be readily installed and at the same time be properly protected against damage by the heat of the furnace. The present invention solves the difficulty in a simple and practical manner as will hereinafter more fully appear.

In the accompanying drawing wherein the preferred form of the apparatus is shown—

Fig. 1 illustrates the manner of applying the present invention to a burner positioned as aforesaid;

Fig. 2 shows the parts of the present invention partly in side elevation and partly in vertical section;

Fig. 3 is a plan view on line 3—3 of Fig. 2;

Fig. 4 is a more or less schematic view of some of the parts of Fig. 1, and

Fig. 5 shows a modified detail of the invention.

Reference numeral 10 indicates a portion of a side wall and 11 a portion of the floor of a combustion chamber 12 of a steam boiler furnace. 13 indicates a multi-apertured burner block through which fuel gas and combustion supporting air are introduced into the combustion chamber. At the intake side of the block 13 is a gas manifold 14 from which extend gas nozzles 15 individual to the ports in the burner block and to which gas is supplied by a supply pipe 16 provided with a gas shutoff valve 17. At the outer face of the wall 10 is a closure 18 adapted to be adjusted to suit the demands for combustion supporting air of the burner. The parts thus far described constitute as it were the environment where the present invention has special utility.

20 indicates an elongated casing which is adapted to be positioned in the wall 10 to form a passage which opens into the combustion chamber 12 from below the burner block. The inner end 21 of the casing preferably terminates short of the discharge side of the burner block as clearly shown in Fig. 1. As best shown in Fig. 4, bricks 22 at either side of the casing will ordinarily be utilized to block up the space at either side of the casing. Disposed on the floor 11 in advance of the end 21 of the casing is a brick 23 which serves to shield the interior of the casing from radiant heat in the combustion chamber. However, instead of utilizing a brick 23 for this purpose it is within the spirit of the invention to make use of an upright heat resisting wall 24 (see Fig. 5) appropriately secured to the adjacent end of the casing as by side walls 25 and a bottom wall 26 welded to the adjacent end of the casing.

27 indicates a pilot burner tube, a portion 28 of which is in the space 28' between the inner end 21 of the casing and the adjacent face of the brick 23, the major portion of the tube being within the casing. The pilot flame port or orifice of the tube is indicated at 29 and it will be noted that this port faces upwardly whereby to project the pilot flame upwardly in front of the burner block. At the inner end of the tube is a secondary flame orifice 30 the flame from which is adapted to play on a heat responsive device 31. Between the two orifices is a row of ignition holes 32. The portion 28 of the tube may be angled upwardly as shown in Figs. 1 and 2 in which event its upper end will be somewhat below the plane of the top wall of the casing to permit the tube to be readily pulled out of the casing through the outer end 33 of the latter; or, as shown in Fig. 5, the projecting end of the tube (indicated at 27') may be coaxial with the other portion of the tube.

Extending into the casing 20 is a gas supply pipe 35 which delivers to a mixing tube 36 which in turn delivers to the pilot burner tube by way of a side connection 37 at a point which is closer to the pilot flame port 29 than to the secondary flame port 30 whereby reduction in gas pressure will cause the secondary flame to become ineffective to heat the heat responsive device 31 before the pilot flame goes out. An abutment 38 at the end of the casing cooperates with the adjacent closed end of the tube 36 to limit the distance that the pilot burner tube may be projected from the adjacent end of the casing.

The heat responsive device 31 is supported by a standard 39 on the mixing tube above and at one side of the secondary flame port whereby unless the gas pressure is sufficient the flame will not be projected far enough to properly heat said device. The effect produced upon the device 31 by the heat of the secondary flame is transmitted by a connection 40 to a control apparatus operatively associated with the gas valve 17, it being understood that unless the device is properly heated the gas valve will remain closed.

In order to prevent the parts within the casing from becoming overheated a damper 42 is pro-

vided at the outer end of the casing for controlling the admission of cooling air to the casing, the position of the damper being adjusted by a screw **43** carried by the same.

From the foregoing description it will be readily understood that the casing **20** is first installed in the wall after which the unit comprising the pilot burner tube **27**, the mixing tube **36** and the heat responsive device **31** is inserted into the casing through its outer end **33**. A transversely extending screw rod **44** carried by the pedestal **39** may be employed to maintain the said unit in centered position.

This application is a continuation in part of applicant's copending application, Serial No. 235,075, filed October 14, 1938, and subsequently abandoned in favor of this case.

What I claim is:

1. In a safety control apparatus for a burner positioned in an upright wall to fire into a combustion chamber formed in part by said wall, the combination of a horizontal axis casing insertable in said wall below said burner, a gas burning pilot for igniting the burner and positioned to fire upwardly from below the top wall of the casing, a tube for supplying gas to the pilot and extending from the latter to a point within the casing and at its inner end having a gas jet orifice, a mixing tube within the casing and delivering to said tube between said orifice and said pilot, a heat responsive device supported by said mixing tube and arranged to be heated by the jet of gas issuing from said orifice, means including said device for shutting off the supply of gas to said burner in case the gas issuing from said orifice is ineffective to heat said device to a predetermined temperature, and said tubes and pilot and heat responsive device being withdrawable from said casing as a unit through the outer end thereof.

2. In apparatus of the class described, the combination of a horizontal axis casing which at one end is closed except for an opening in the top wall of the casing, a heat responsive device within the casing remote from said opening, a gas conducting tube having a relatively large size gas discharge port at one end and a relatively small gas discharge port at its other end, said tube being arranged longitudinally within the casing with its large size port facing said opening and with its small size port facing said device whereby gas issuing from the small size port may heat said device and whereby gas issuing from the large size port may produce a flame outside of the casing for igniting a burner, a mixing tube within the casing and delivering to said tube between the ends of the latter, said heat responsive device being supported by the mixing tube, and both of said tubes and the heat responsive device being withdrawable from the casing as a unit through that end of the casing opposite the closed end thereof.

GEORGE C. BERGTHOLDT, JR.