

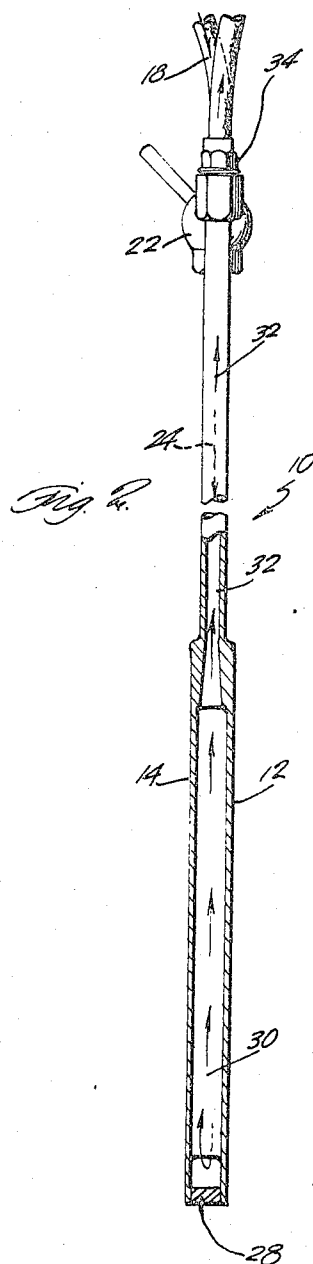
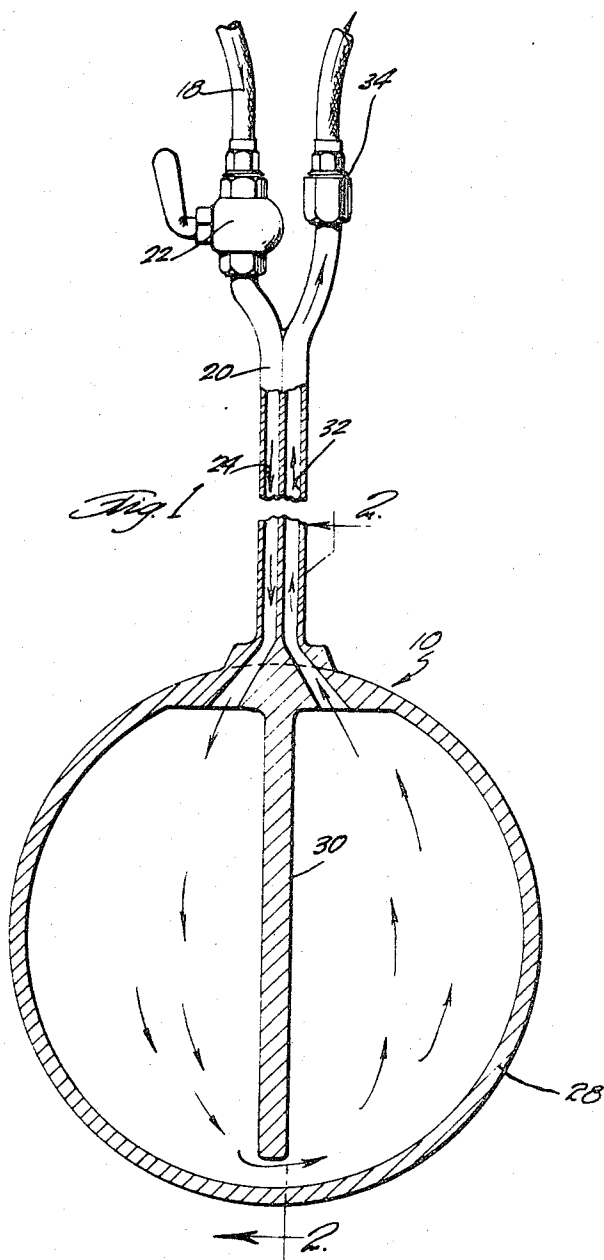
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WATER-COOLED INSPECTION MIRROR

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WATER-COOLED INSPECTION MIRROR

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1 Claim

ABSTRACT OF THE DISCLOSURE

A water-cooled inspection mirror having a water-cooled double surface comprised of metal or other material for use in checking combustion conditions in a combustion device, and including a peripheral envelope around the space formed between the pair of reflecting surfaces, a flexible feed line for water to be fed into the area between the pair of reflecting surfaces for cooling the mirror, and means to eliminate water from the area between the reflecting surfaces for eliminating such heated water.

The present invention relates to a water-cooled inspection mirror for insertion into fire boxes and furnaces while such fire boxes and furnaces have the process of combustion taking place therein, and more particularly the invention relates to a water-cooled double surface mirror comprised of metal or other material for use in checking the combustion conditions or other conditions that may exist incident to combustion in a furnace fire box, and also for assisting the maintenance workman when adjusting the burner nozzle, air shutter or other burner feed apparatus so that accurate control and observation of the combustion is obtained.

In a preferred embodiment of the invention showing the best mode of operation presently known, the water cooled mirror comprises a pair of reflecting surfaces acting as a mirror surface and includes a peripheral envelope around the space formed between the pair of reflecting surfaces, and providing a flexible or rigid feed line, so that there may be manual movement of the water-cooled mirror, as water is fed into the area between the pair of reflecting surfaces for cooling the mirror, and as the heated water resulting from the mirror being inserted in a furnace fire box is heated, the water is run off to a waste or sewer line.

An object therefore of the invention is to provide a compartment between the reflective surfaces of a pair of mirrors, so that as water is passed therethrough, the heated water is run off to a waste line, and the mirror may be concurrently used for checking and viewing the process of combustion in such furnace.

A further object of the invention is to provide a pair or reflecting surfaces of either circular or rectangular configuration being separated by a body of flowing water therethrough, so that the water tends to cool any heating of the reflecting surfaces caused when inserted into a furnace, and the water introduced into the cavity is directed around the surface of the mirrors by a baffle across a diameter of the cavity so that effective cooling of the inner side of the mirror surfaces is achieved before the heated water is passed to a waste line.

A further object of the present invention is to provide a water-cooled mirror that can be kept over a flame quite indefinitely without tarnishing, and in which the mirrors are maintained cooled by a rapid flow of water over the inner surfaces of the mirror so that the surfaces do not oxidize or tarnish or otherwise become defective for achieving full observation of combustion conditions in a furnace.

A further object of the invention is to provide a water-cooled mirror that need not be introduced into the flame hurriedly, kept away from hot parts of the flame and removed quickly, as would be common in the prior art, but to obtain a more full observation of the combustion conditions by reason of the water cooling effect achieved on the inner surfaces of the mirror components.

The above and other objects and advantages of the invention will become apparent upon full consideration of the following detailed description and accompanying drawings in which:

FIGURE 1 is a broken away, cross-sectional view showing the feed and waste line connections together with the internal circulation path of the water-cooled inspection mirror of the present invention; and

FIGURE 2 is a cross-sectional view taken along lines 2—2 of FIGURE 1.

Referring now to the drawings, there is shown a water-cooled inspection mirror 10 having a pair of heat reflecting plates 12, 14 constructed of a metal, such as stainless steel plated and that may be either square or rectangular or circular, the circular embodiment being shown in FIGURES 1 and 2, and in which the outer surfaces of the plates 12, 14 are polished to a mirror surface for use in checking conditions in a furnace firebox as well as for providing assistance to maintenance men when inserted in a firebox for use in adjusting the burner nozzle, air shutter, and other components of the burner.

As is illustrated in the drawings, there is a water supply line 18 of flexible hose which is connected to a spigot of the water line in the laboratory, and is then connected to a flexible handle 20 which may include a water valve 22 for turning the water line off and on, respectively. The flexible handle 20 conveys the water through a line 24 to one side of the cavity between the reflecting plates 12, 14, which cavity is separated into two component parts by a baffle 30 so that the water is caused to circulate around the housing within the brass or metallic peripheral element 28 and between the mirror surfaces formed by plates 12, 14 and is then discharged through a passage 32 so that the water maintains the surface areas of the reflecting plates 12, 14 in a relatively cool condition although they are proximate to a burner and flame of the furnace.

The baffle 30 in the housing separates the flows of water, that is the inflow from the return flow, and thus facilitates the discharge circulation in order to maintain each of the mirrors sufficiently cool in order to reflect a clear and distinct image of conditions in the firebox.

Line 32 terminates in a hose connection 34 which in turn is connected to a waste or sewer line (not shown).

In the manner above described, the water-cooled mirror of the invention may be kept over and proximate to a flame for indefinite periods without tarnishing, and the mirrors may thus be continuously maintained within the flame area without being removed since the mirror surfaces do not become tarnished since the water provides substantially cooling effect thereto.

Additional embodiments of the invention in this specification will occur to others and therefore it is intended that the scope of the invention be limited only by the appended claim and not by the embodiment described hereinabove. Accordingly, reference should be made to the following claim in determining the full scope of the invention.

What is claimed is:

1. A water-cooled inspection mirror for insertion into a firebox comprising a pair of spaced parallel disposed polished metal reflecting plates of circular configuration forming a cavity, an annular metallic sealing element interconnecting the edges of said plates to seal off said

cavity, a handle secured to said sealing element, said element having passages interiorly of said cavity, an inlet flow line in said handle communicating with one of said passages to convey water for cooling the inner surface of the cavity when subjected to conditions of heat, an outlet line in said handle communicating with the other of said passages to exhaust heated water from said cavity, a baffle having one end fixed to said element between said passages disposed in said cavity to circulate water throughout the entire inner surface of the cavity, the other end of the baffle being spaced from said sealing element to provide communication means between portions of said cavity and with each said inlet line and outlet line, said water-cooled inspection mirror being constructed for continuous use within a firebox without tarnishing or other deleterious effects being imposed upon the mirror surfaces of said reflecting plates.

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