

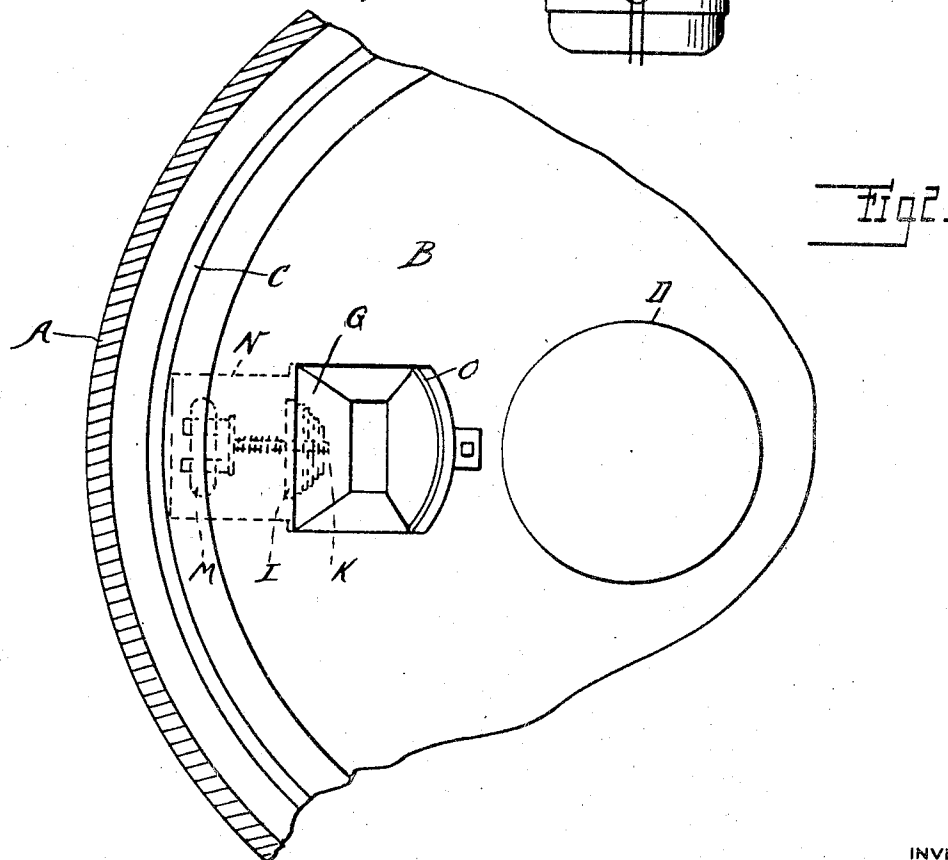
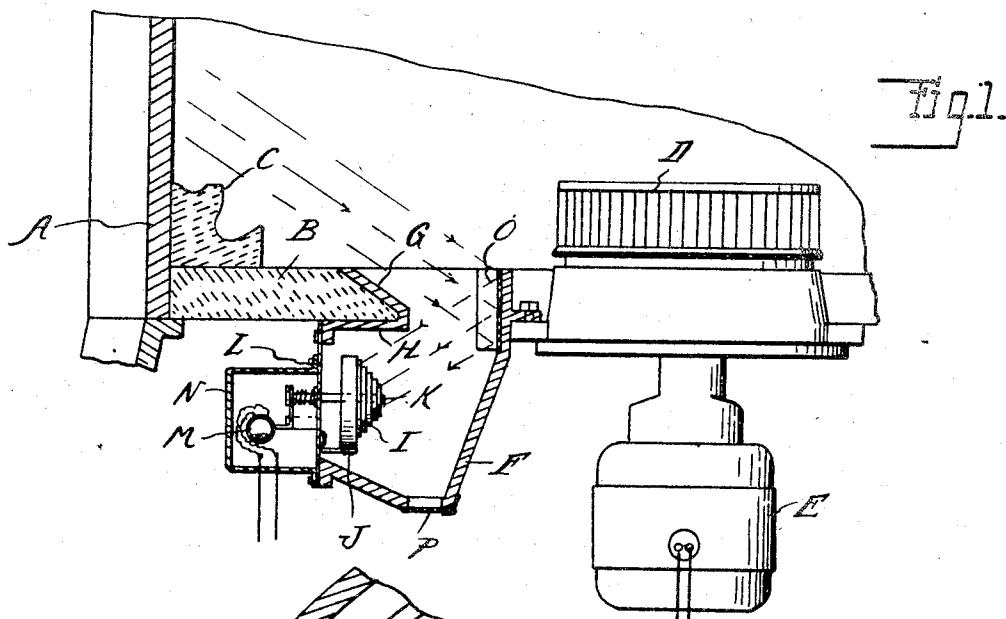
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BURNER CONTROL MECHANISM

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BURNER CONTROL MECHANISM

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The invention relates to burner control mechanisms such as are used in connection with oil or gas burners and has particular reference to the means for stopping the burner in case of failure to ignite or upon failure of combustion after ignition has taken place. Where electric or gas ignition is used it is customary to maintain the ignition circuit for a sufficient length of time, to insure ignition but it is desirable to cut off the current as soon as the fuel is lighted. These objects have been accomplished by using radiant energy from the flame for operating a thermostat that controls the running and ignition circuits. It is, however, necessary that the thermostat should be so placed as to receive the radiant energy and this with many constructions of furnace is difficult to accomplish. For instance, in the round boiler type of furnace it is usual to construct a hearth at the grate level of the boiler and to place the oil spraying nozzle centrally above this hearth. In this case the most feasible location for the control device which must be directly in the path of the radiant energy, is in the firedoor of the boiler. Such a position is not desirable as the firedoor is opened from time to time and the loose cable connections to the device are subject to damage. A position for the device within the combustion chamber near the hearth level is much to be desired but has been impossible to attain due to the intense heat which would destroy the usual control device, and also the interference which such a device would introduce to the operation of the burner.

It is the purpose of the present invention to avoid the above described difficulties by a construction in which the control device is effectively shielded from the heat of combustion, does not project into the combustion chamber where it might interfere with the operation of the burner, and in addition may be attached directly to the burner unit thus greatly simplifying the installation and wiring. At the same time the heat sensitive mechanism of the device is fully exposed to radiant energy from the flame. With these

objects in view the invention consists in the construction as hereinafter set forth.

In the drawings:

Figure 1 is a vertical central section through a portion of an oil burning furnace showing my improved construction of thermostat in relation thereto;

Figure 2 is a plan view.

As shown, A is the inner wall of the boiler, B a refractory hearth at the base of the boiler provided with the annular grooved ring C against which the liquid fuel spray is directed from a revoluble sprayer nozzle D arranged centrally of the hearth and operated by an electric motor E beneath the hearth, these parts being of any suitable construction.

Located in the hearth at a point intermediate the nozzle D and the ring C is a recess in which is placed a housing F extending downward and laterally outward beneath the hearth. The outer wall of this housing in the portion G thereof passing through the hearth is bevelled so as to leave an unobstructed path for the heat rays from the flame and at the same time to form a shield for covering the portion H of the housing extending radially outward beneath the hearth. In this shielded portion of the housing I arrange a thermostat I which as shown is in the form of a spirally bent bar of composite metal, its outer end being anchored at J and its inner end attached to a revoluble shaft K. These parts are mounted on a plate L which is detachably secured to cover an opening at the radially outward end of the housing F, the said shaft K passing through the plate and having on its outer end a circuit closing switch. This is preferably a mercury switch comprising a glass tube M having electrodes extending thereinto and a sufficient quantity of mercury to electrically connect these electrodes when the tube is tilted in one direction. The switch may be protected by a housing N enclosing the same and outside of the plate L.

With the construction as thus far described the thermostat I is out of the direct path of radiant energy and therefore would not be effected by the turning on or off of the flame.

I have, however, arranged a reflecting mirror O on the inner wall of the recess in the hearth and in such position and at such angle as to direct the radiant energy from the flame upon the thermostat I. Preferably this mirror is concave as illustrated in Figure 2 so that the heat rays are concentrated upon the thermostat. Thus in operation whenever the fuel is ignited the flame extending upward from the ring C will radiate heat which falling upon the mirror O will be directed towards and concentrated upon the thermostat I so as to bring about an almost instantaneous response. This will cause the tilting of the tube N effecting either the closing or the opening of an electric circuit which controls the operation of the burner and cuts off the current supply thereto under abnormal conditions.

The lower portion of the housing F is preferably hopper shaped and is provided with an opening at its lower end normally closed by a plate P. This constitutes a receptacle for collecting any dirt which may fall into the opening in the hearth and which from time to time may be removed by detaching the plate P.

What I claim as my invention is:

1. The combination with an intermittently operated fuel burner and a control circuit therefor, of a hearth beneath said burner having a small aperture therethrough, a thermostatically operated mechanism for controlling said circuit located beneath said hearth at one side of said aperture, and a reflector located to receive through said aperture radiant heat from the flame and to redirect the same upon said thermostatic element.

2. The combination with an intermittently operated fuel burner and a control circuit therefor, of a hearth beneath the burner having a small aperture therethrough, a thermostatically actuated mechanism for controlling said circuit located beneath said hearth at one side of said aperture, a reflector for receiving through said aperture radiant heat from the flame and redirecting the same upon said thermostat, and a housing for enclosing said thermostatically operated mechanism.

In testimony whereof I affix my signature.
MILTON A. POWERS.

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