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A. MAEHLER ET AL
DRYING AND ENAMELING OVEN

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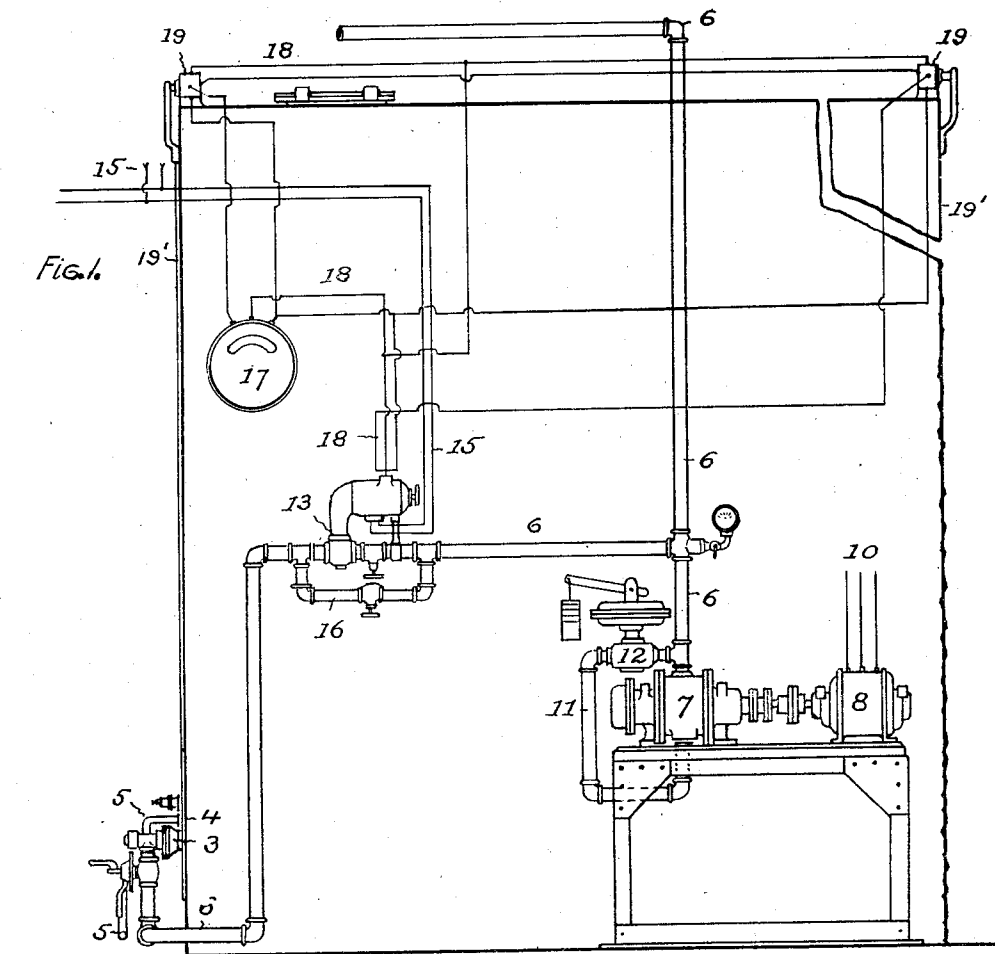


Fig. 3.

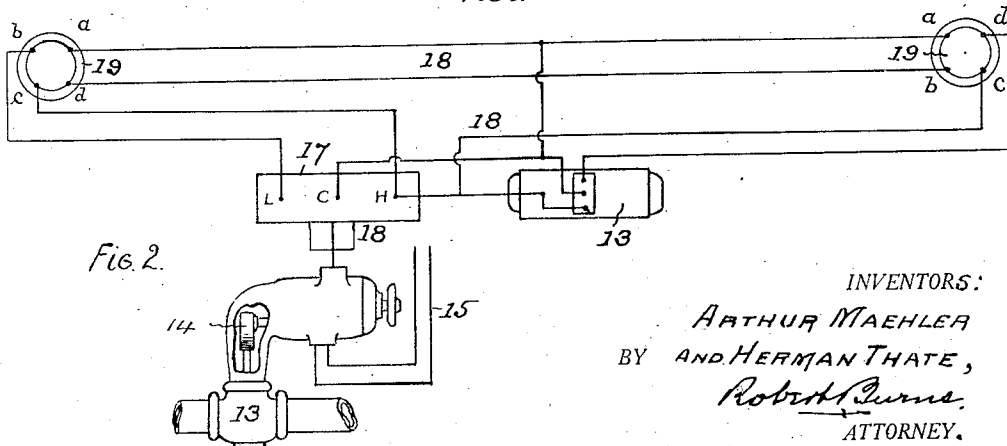


Fig. 2.

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DRYING AND ENAMELING OVEN.

Application filed August 5, 1926. Serial No. 127,278.

This invention relates to that class of drying and enameling ovens in which the ventilation of the oven is of the exhaust type and in which the temperature in the chamber of the oven is regulated by an automatically operating electric means of the thermostatic type acting to govern the supply of the fuel to the oven burners. In such class of ovens as heretofore controlled, with the opening of the oven doors the thermostatically operated controlling means acted to supply an additional supply of fuel to the oven burners to compensate for the loss of heat in the oven chamber due to an open condition of the oven doors, consequently in such older oven constructions the supply of fuel had to be shut-off by hand, when a saving of fuel and avoidance of accident was desired. With a view to remedy such defect in the operation of the oven, the present improvement has for its object:

To provide means combined with the automatic thermostatically operated electric controlling means of a drying and enameling oven of the class above described, whereby the operation of said controlling means is in turn governed by the open and the closed condition of the doors of such oven structure, all as will hereinafter more fully appear.

In the accompanying drawings:

Fig. 1, is a side elevation of an oven to which is applied the controlling and operating mechanisms and their electrical connections in the preferred form of this invention.

Fig. 2, is a detail elevation of the motor actuated shut-off valve of the fuel supply pipe of the oven burners.

Fig. 3, is a diagram of the electric circuit of the oven control system.

Like reference numerals indicate like parts in the different views.

This improvement, in its preferred form, is shown in the drawings applied to an oven structure of the indirectly heated class, preferably of the type of drying and enameling ovens shown and described in detail in a companion application for Letters Patent Serial No. 127,276, with the heating means of the oven chamber consisting in one or more heating units arranged adjacent to the side wall or walls of the oven chamber and with each of said units having a lower horizontal combustion trunk or chamber having its air inlet formed in the front wall of the oven structure, and with said trunk or chamber

containing the horizontally arranged orificed tubular gaseous fuel burner 3 and associated pilot light 4 of the oven structure. In such construction the supply of gaseous fuel to the pilot light 4 is from a constant source of supply independent of the supply of gaseous fuel to the burner 3 aforesaid of the heating unit, with said gaseous fuel supplied to the pilot light by a valved pipe 5 extending from the source of supply to said pilot light.

The gaseous fuel supply to the aforesaid burner 3 is preferably of the pressure feed type in which the gaseous fuel is forced into the supply pipe 6 of the burner by a gas pump 7, preferably of the rotary form and operated by an electric motor 8 of the commercial three phase type, the operation of which is controlled by a switch in the supply line 10, with said switch automatically controlled in the manner hereinafter described in detail.

The rotary fuel pump 7 above referred to will have the usual by-pass connection 11 between its inlet and outlet ends, with said connection including a safety valve 12 as shown, and for the purpose of preventing an over pressure of gaseous fuel in the supply pipe or main 6 as usual in the present and allied arts.

A shut-off valve 13 is arranged in the supply pipe 6 between the pump 7 and the heating burner 3, and is preferably of an old and well known type, in which the movable valve member or head tends to move to a closed position under the influence of a spring, while the open position of said movable valve member is effected by a revoluble cam or eccentric 14 which has operative engagement with the stem of said movable valve member. Rotary movement of the cam or eccentric 14, at a proper speed, is attained by a train of speed reducing gears arranged between the carrying shaft or the cam of eccentric 14 and the armature shaft of an electric motor associated with the containing shell of the shut-off valve 13, with said motor preferably of the three terminal control type and having the usual two line supply circuit 15. A motor actuated valve of the above described construction is now in extended use in the heating art under the title of the "Dickson-Honeywell motor valve".

The usual valved by-pass connection 16 is arranged in the gaseous fuel supply pipe 6, and spans the shut-off valve 13. Said

connection is intended to permit a limited and controllable flow of gaseous fuel to the burners 4, when the shut-off valve 13 is in its closed condition. The purpose is to keep
5 the burner 4 of a heating unit in a lighted condition at all times during the progress of the drying and enameling operation.

The three terminal control electric motor of the shut-off valve 13, above referred to,
10 is automatically controlled by a suitable thermostatically operated automatic electrical instrument 17 of any usual and suitable construction, preferably a generally used instrument in this and other arts and known
15 as the "Tyco's thermostat," made by the Taylor Instrument Co., of Rochester, New York.

The three terminal control posts of the motor of the shut-off valve 13 are connected
20 by a three wire line or circuit 18; with the like number of terminal posts of the thermostatic control instrument 17, and in the present improvement said three wire circuit 18 is extended as shown in Figs. 1 and 3 to
25 include, a current reversing switch 19 that is operatively controlled by the open and the closed condition of a door 19' of the oven structure, and so that with an oven door in an open condition, the terminals *a-c*, of a
30 switch 19 will be electrically connected by the movable member of the switch, and when such oven door is in its closed condition the terminals *b, a*, of the switch will be electrically connected by said movable member of
35 the switch. With the described arrangement, when the oven door or doors are closed, a normal flow of electric motive force in the

three wire circuit 18, will take place, in the usual controllable manner under the influence of the automatic mechanism of the thermostatic control instrument 17. When how-
40 ever any one door or doors of the oven structure is opened either accidentally or intentionally, the current reversing switch 19 operated by such oven door or doors, will re-
45 verse and change the direction of the currents in the three wire circuit 18, to again operate the motor of the shut-off valve 13, and operate the movable valve member of
50 said valve to its closed position, shutting off the passage of gaseous fuel to the oven burners 3, other than the limited supply to said burners which pass to the burners through the by-pass connection 16, aforesaid.

Having thus fully described our invention,
55 what we claim and desire to secure by Letters Patent, is:—

In an automatic temperature control system for drying and enameling ovens of the indirectly heated gaseous fuel type, and in
60 which a thermostatically controlled electric mechanism has controlling connection with a motor actuated valve in the fuel supply to the oven burners, the combination of an electric circuit embracing said instrument, a cir-
65 cuit reversing switch arranged in said circuit, and an operating connection between said switch and an oven door, adapted to operate said switch to one position in an opening of said door, and operate the switch
70 to the reverse position as said door is moved to a closed condition.

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