This invention relates to an oven temperature control system adapted to control the oven temperature over a wide range.

Domestic gas heating ovens are now being made with heavily insulated walls in order to conserve the heat. It is necessary even when the walls are insulated to have a large burner in order to quickly heat the oven up to the desired temperature. Where a large burner is used, however, it is difficult to regulate it so as to maintain a low temperature. In order to overcome this difficulty, the present invention has been had to the use of smaller burners. These smaller burners, while satisfactory in maintaining a relatively low temperature, say, 275° F., do not enable the oven to be heated up to a relatively higher temperature, say, 550° F., as quickly as desired. It is also customary to use the same burner in the domestic gas range ovens for a broiler burner, but when the smaller burner is used, it does not have sufficient broiler area to satisfactorily serve its purpose.

The present invention overcomes these difficulties and gives control of an oven from a low temperature, say, 275° F., to a high temperature, say, 550° F. It also enables the oven to be brought up quickly to the higher temperature and provides sufficient broiler capacity.

In the accompanying drawing, which illustrates the present preferred embodiment of my invention,

Figure 1 is a perspective view of an oven provided with the temperature control system, parts of the oven being broken away; and

Figure 2 is a sectional view of a pressure operated diaphragm valve of the snap action type used in the system.

Referring more particularly to the accompanying drawing, there is shown an oven 2 having heat insulated walls 3. Inside of the oven there is arranged a main burner 4 and an auxiliary burner 5, the main burner being supplied with gas through an orifice and mixer 6 and the auxiliary burner 5 being supplied with gas through an orifice and mixer 8. In the form shown in the drawing, the two burners 4 and 5 are formed in a single hollow casting 9 into which a plug 10 is inserted as indicated to separate the two burners 4 and 5 from each other.

The two burners, although formed in a single casting, might, if desired, be formed as separate units, the plug 10 in the embodiment shown serving the same purpose as entirely separate burners. The burner 4 has an arm 11 and an arm 12, each provided with ports 13. The burner 5 has an arm 14 and an arm 15 likewise provided with ports 13. The ports in the arms 12 and 15 of the two burners are close enough together so that one burner may be lighted from the other. However, in order to insure lighting of the burners, a pilot light having arms 16 and 17 is provided. The arms 16 and 17 of the pilot light are connected by a T 18, to which is connected a tube 19 leading to a fitting 21 which is connected to the main gas supply pipe 20. The flow of gas through the tube 19 may be controlled by a valve 22.

A gradual action thermostat 25 is located outside of the oven, the valve in the thermostat being controlled by a thermocouple 26 extending into the oven. The inlet to the thermostat is connected by a pipe 27 to the main gas supply pipe 20. The outlet of the thermostat is connected by a pipe 28 to the mixer 8 which supplies the burner 5. A pressure operated diaphragm valve 30 of the snap action type is connected by a pipe 31 and T 32 to the pipe 28 at a point intermediate the thermostat 25 and the mixer 8. The valve 30 controls the flow of gas through the pipe 20 and, therefore, controls the admission of gas to the mixer 6 which supplies burner 4.

The construction of the valve 30 is illustrated in Figure 2. It comprises an upper casting 33 and a lower casting 34 secured by bolts 35 which also secure in place a diaphragm 36 which forms an upper chamber 37 and a lower chamber 38. A stiffening plate 39 is connected to the diaphragm by a rivet 40 and a washer 41. Mounted below the diaphragm and in a position to be contacted by the rivet 40 is a plunger pin 42 which is slidable in an opening 43. The lower end of the plunger pin 43 contacts with the stem 44 of a valve disc 45. The valve disc is normally pressed against its seat 46 by a spring 47, the spring and disc being centered by a tube 48 secured in an opening 49 in the valve casing. The upper chamber 37 is provided with a screw threaded opening 50 for connection with the pipe 31. The lower chamber 38 is provided with an air opening 51 which, if desired, can be piped to a flue as a safety precaution against the escape of gas should the diaphragm 36 leak gas from the upper to the lower chamber. A screw 52 extends into the upper chamber 37 in a position to contact with the rivet 40. The screw is provided for the purpose of manually depressing the diaphragm 36 in case the gas pressure is insufficient to operate it automatically as hereinafter described.
The operation of the device is as follows: Assuming that the oven is cold and that the pilot light is burned, the gas is admitted to the pipe 27 through pipe 28 to thermostat 25 and then through pipe 28 to the mixer 5 which supplies the burner 4. When the temperature of the oven is below that for which the thermostat 25 has been set, the valve in the thermostat 25 is opened and a quantity of gas is admitted to the pipe through than can be discharged from the orifice and mixer 5. Accordingly, a back pressure is built up in the pipe 28 and this back pressure is transmitted through the T 32 and pipe 31 to the upper chamber 37 of the diaphragm valve. The back pressure, acting upon the top of the diaphragm 36, depresses the plunger 42 and the valve disc 45, thereby opening the valve and allowing gas to pass therethrough to the orifice and mixer 5 which supplies the burner 4. The burner 4 is lighted by the pilot light so that both the burners are available for quickly heating the oven up to the temperature for which the thermostat has been set. The thermostat 25 is closed by the gradual action type and gradually decreases the valve opening as the temperature rises thereby cutting down the amount of gas flowing through the thermostat. As the amount of gas is cut down, the back pressure in the chamber 37 becomes less and the valve disc 45 is raised against its seat by the action of the spring 47. This entirely cuts off the supply of gas to the burner 4, but the temperature of the oven is maintained by the burner 5. If, however, the temperature in the oven drops, the valve in the thermostat 25 is opened by the thermocouple, the back pressure on the top of the diaphragm 36 increases, and the disc 45 is lowered so as to allow gas to be fed again to the burner 4.

It will be seen from the above description that in this system a plurality of burners is controlled by a single thermostat. Both burners are used in bringing the oven up to temperature, but when that temperature has been reached, one of the burners is shut off, thereby providing a flexible system adapted to regulate the temperature over wide ranges. The oven may be quickly brought up to temperature and yet a relatively low temperature may be maintained if desired.

I have illustrated and described the present preferred embodiment of my invention. It is to be understood, however, that the invention may be otherwise embodied within the scope of the following claims.

I claim:

1. In a temperature control system, a plurality of burners, a gradual action thermostat for regulating the supply of gas to one of said burners, and a pressure controlled valve responsive to the pressure of gas fed through said thermostat for controlling the gas supply to another of said burners.

2. In a temperature control system, a main burner, an auxiliary burner adjacent said main burner, a gradual action thermostat for direct regulation of gas to said auxiliary burner, and a pressure controlled valve responsive to the pressure of gas fed through said thermostat for admitting or entirely shutting off the gas supply to said main burner.

3. In a temperature control system, a main heating burner, a diaphragm operated snap action valve for controlling the gas thereto, an auxiliary burner designed to maintain various uniform temperatures after the main burner has functioned, and a thermostat for regulating the fuel supply to said auxiliary burner, said snap action valve being responsive to said thermostat.

4. A temperature control system comprising a main heating burner, a cut-off valve adapted to completely cut off or fully supply gas to said main burner, an auxiliary burner for maintaining various desired uniform temperatures after the main burner has functioned, a gradual action thermostat responsive to the temperature being controlled for the regulation of gas to said auxiliary burner and adapted to indirectly operate said main burner when needed.

5. In a gas fire, a dual burner having one section controlled by a snap action valve and another section controlled by a gradual action valve, and a thermostat responsive to oven temperatures for operating said valves.

6. In a gas range, a pair of heating burners arranged so that one may ignite the other, a gradual action thermostat responsive to oven temperatures for controlling the gas supply to said burners, one of said burners being automatically controlled so that the gas is turned off when the other burner is operating continuously when the oven is heated, the supply of gas to said other burner being regulated by said thermostat.

7. In a temperature control system, a plurality of burners, a gradual action thermostat for regulating the supply of gas to one of said burners, and a pressure controlled valve responsive to the pressure of gas fed to the aforementioned burner for controlling the gas supply to another of said burners.

8. In a gas range having an oven, a pair of burners for supplying heat to the oven, a snap-action valve for controlling one of said burners, a gradual action valve for controlling the other of said burners, and a thermostat responsive to oven temperatures for operating one of said valves and controlling the operation of the other.

9. In a gas range having an oven, a pair of burners for supplying heat to the oven, a pressure operated snap-action valve for controlling one of said burners, a gradual action valve for controlling the other of said burners, and a thermostat responsive to oven temperatures for operating the gradual action valve, the snap-action valve being actuated by the pressure of gas supplied to the other of said burners.

10. In a gas range, a two-section burner having the gas supply to one section thereof regulated by a snap-action valve and the gas supply to the other section controlled by a gradual-action valve, and a thermostat responsive to oven temperatures for operating the gradual-action valve, the snap-action valve being actuated by the pressure of gas supplied to the first-mentioned burner section.

11. In a temperature control system, a main burner and an auxiliary burner, means through which gas may be supplied to each of said burners, a thermostatically controlled valve for regulating the supply of gas to said auxiliary burner, and a valve for controlling the supply of gas to the main burner, said last-mentioned valve being controlled by the pressure of the gas supplied to the auxiliary burner.

12. In a temperature control system, a plurality of burners, a gradual-action thermostat for regulating the supply of gas to one of said burners, and a pressure controlled valve responsive to the pressure of gas supplied through...
said thermostat for controlling the gas supply to another of said burners, said valve being operatively interposed between the thermostat and the first-mentioned burner.

13. In a gas range, a main burner and an auxiliary burner in juxtaposition, a thermostat for regulating the supply of gas to the auxiliary burner, and a valve operatively interposed between said thermostat and said auxiliary burner for controlling the supply of gas to the main burner.

14. In a gas range, a main burner and an auxiliary burner in juxtaposition, a thermostat for regulating the supply of gas to the auxiliary burner, and a valve operatively interposed between said thermostat and said auxiliary burner for controlling the supply of gas to the main burner, said valve being controlled by the pressure of gas supplied to the auxiliary burner.

MAX SAMUEL UNGER.