

The electric thermostat makes or breaks one or more electric circuits. In other words it amounts to an automatically operated switch which opens and closes circuits in response to the change in temperature. The controlled devices may be constructed to be positive or gradual acting.

There are many models of all of these thermostats which may be generally grouped as follows:

1. *Room Thermostats.* All thermostats which are designed to be used in a room to control the temperature within that area.
2. *Duct Thermostats.* These instruments are constructed so that the thermostatic element is in the air duct or chamber and the remainder of the instrument is on the outside of the duct. This type of thermostat is generally used to control the temperature of the air in various parts of ventilating and air conditioning systems.

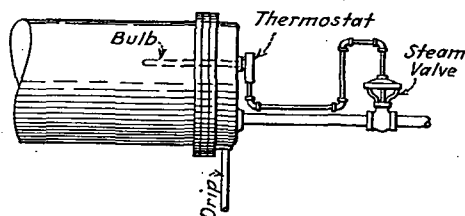


FIG. 4. SELF-CONTAINED THERMOSTAT IN HOT WATER STORAGE TANK

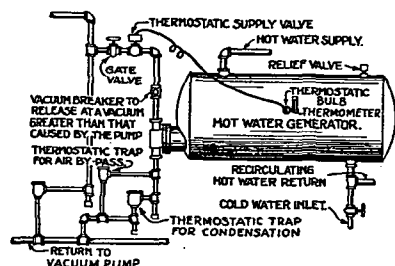


FIG. 5. SELF-CONTAINED THERMOSTAT ON HOT WATER TANK WITH VACUUM RETURN

3. *Two-Temperature Thermostats.* These instruments are used when it is desired to control at two distinct temperatures at different periods by means of a single thermostat. For example, a temperature of approximately 70 F may be desired during the day, while some lower temperature is satisfactory during the night. Shifting from the high to the low temperature may be accomplished at some remote point by means of a clock or a manual switch.

4. *Clock Thermostats.* These instruments are arranged with clock mechanisms to maintain predetermined temperatures at predetermined hours, such as a low night temperature which may be automatically increased at a certain hour to the proper day temperature.

5. *Weather Compensating Thermostats.* These instruments control the temperature of a building with respect to the outdoor temperature. Two thermostatic elements, one of which is placed outdoors and the other attached to a radiator, are arranged so as to operate the supply of heat in conjunction with each other. The temperature of the radiator is thus decreased as the weather temperature rises. This system may control the temperature of hot water, the pressure on a steam boiler, the volume of steam sup-

plied from outside the building, the amount of gas or oil fuel consumed, or the operating rate of a coal stoker.

TEMPERATURE CONTROL SYSTEMS

The foregoing discussion has concerned the sensitive element of the thermostat and its work. The following pertains to the types of control used for (1) direct radiators, (2) unit heaters, (3) unit ventilators, and (4) central fan systems.

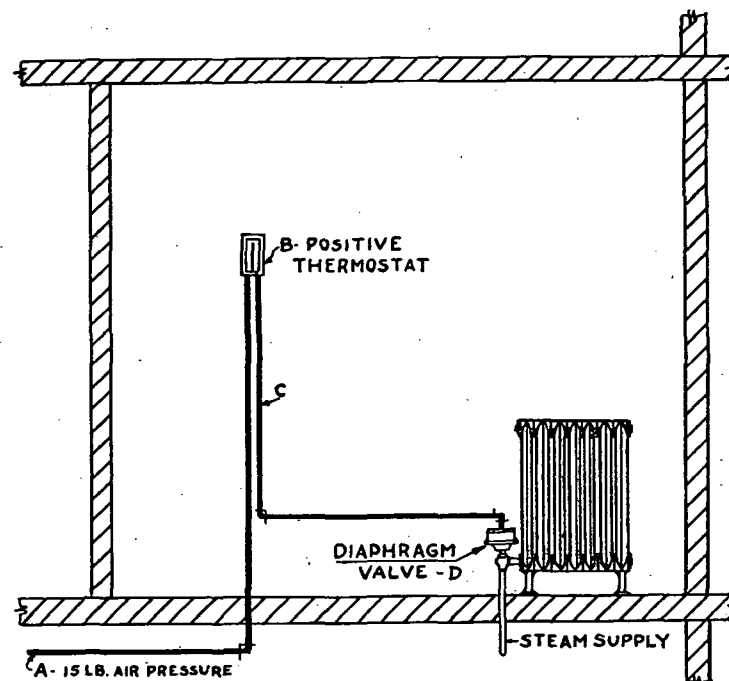


FIG. 6. CONTROL OF DIRECT RADIATOR WITH POSITIVE THERMOSTAT

Control of Radiators or Convectors

The control of rooms heated by radiators or convectors may be accomplished in several different ways. The problem is to control the heating units located at one or more points in or adjacent to the room. The circulation of air is not rapid, and the rate of temperature change usually is slow. The types of controls commonly used are: *first*, the direct-acting radiator valves with the thermostatic element at the valve, or at some adjacent point in the room and connected to the valve by means of a capillary tube; and *second*, the indirect-acting thermostat controlling either air or electrically operated valves. Fig. 6 shows a radiator controlled by an indirect-acting thermostat.

A discussion of control of steam heating systems is given in Chapter 31.