

1. A general thermostat in a representative room, controlling the electric supply to the burner motor.
2. An additional thermostat in the boiler or furnace which will take control should No. 1 thermostat fail to prevent improper or unsafe temperature being maintained inside the heater.
3. An additional thermostat at the gas pilot which, unless kept warm by the pilot flame, will bring about the opening of the main switch to the burner motor, thus insuring that no fuel shall be injected unless a flame is in being surely to ignite it.

There are many other combinations for giving assured protection with oil burners other than thermostatic devices, such as pressure and weight-actuated mechanisms, but it is doubtful whether they are as reliable as the thermostatically controlled schemes.

Where electric ignition for the intermittent oil spray is used, it is safer to provide for a continuously operating spark, and to have a thermostat in the heater which will cut out the main switch if the temperature ever gets lower than the critical point which indicates failure to ignite the spray.

#### Gas Burner Control

The same high intensity as with oil fuel makes it necessary to depend on thermostats to prevent waste, and the intermittent operation and necessity for a pilot flame makes it wise to install for gas the same combination of three thermostats as for oil burners, one on the general service, one in the heater and one on the pilot flame.

#### DOUBLE THERMOSTATIC CONTROL

Nearly all buildings equipped with a large number of thermostats and using compressed air for power, are occupied only part of each 24 hours, and can without any prejudice be kept at a lower temperature during unoccupied periods, as over night or over a holiday. The conventional thermostats as ordinarily applied militate against this arbitrary reduction, and each instrument would have to be adjusted each time for the lower degree, and then each would have to be restored following the unoccupied period. Equipment is available which provides two temperature adjustments to each instrument, such that if the general air pressure leading from the central compressor to the thermostat is suddenly changed, the service is switched automatically from one control to the other, and if the pressure again shall be suddenly changed, the service will be switched back. Thus at 6 o'clock P. M., say, the engineer of an office building releases the air pressure for an instant and all of the thermostats are switched from the 68 deg. control to the 45 deg. control. Either control, of course, is set for any temperature desired. At say 7 o'clock the following morning, a repetition of the drop in air pressure will restore to service the 68 deg. temperature.

In a school building the compressed air supply mains may be grouped so that parts of the building used for night school only remain on the 68 deg. service, while others can be thrown over to the alternate service and kept much cooler until again required for occupancy.

A familiar scheme similar to the foregoing, with a cooler temperature automatically maintained during the night and increased early in the morning is in use, with the switch operated by a clock, for residence work.

#### Central Station Heating

Central plants should always be governed by thermostats as a measure of economy, and many public service companies require the installation of automatic heat control for this reason. Where economy is of greater consideration than comfort, it often suffices to install one unit type thermostat in a representative room, this controlling a main valve at the entrance to the building.

Where steam at appreciable pressure is furnished from a central station, a combination of pressure reducing valve and cut-off valve, controlled by a thermostat in a representative room, gives excellent results, as it automatically varies the steam pressure in the radiating surface within a considerable range, giving excellent regulation as well as economy.

#### Automobile Engine Control

The importance of thermostatic regulation of the cylinder temperature of internal combustion engines has long been recognized, but until comparatively recent developments in the production of thermostats, has been ignored in practice.

Now the majority of automobiles are provided with thermostats in the cooling medium controlling the volume of air passing the radiator by means of shutters. Several widely advertised and highly developed makes have thermostatic control of valves in the circulating medium.

#### AUTOMATIC HEAT CONTROL IN INDUSTRY

Automatic control of heat in manufacturing processes is believed to be still in its infancy. The promotion and development of automatic heat control was hard pioneering for many years. The reward for this pioneering seems to be in process of realization in the fabulous uses of thermostats in industry.

Without automatic heat control in innumerable manufacturing processes, what now are sure and perfect reactions would be only occasional successes, and the cost of production would be much higher.

In beet sugar making there are at least eleven processes where exact thermostatic control is imperative. In tanning leather there are at least fourteen such stages.

Without exact temperature and humidity control, no fine printing is possible, and no good weaving or dyeing is assured.