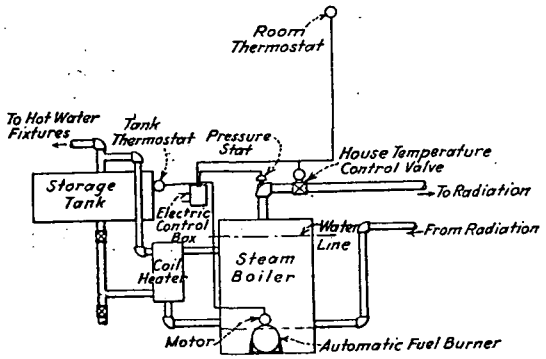


FIG. 11. TWO THERMOSTATS CONTROLLING AUTOMATIC ONE FUEL BURNER, ON DUAL SERVICE, HOUSE WARMING AND WATER HEATING

Note.—Usual safety controls to be used although not shown here.

produced, and which is pumped through insulated pipes to the various out-lying boxes.

Since the brine temperature is usually much lower than the desired temperature for many of these boxes, the automatic heat control of each unit is desirable and effects a considerable saving in operating cost.

Unit type thermostats are especially well adapted to this service and are available for control of such comparatively cool substances as drinking water, or storage compartments in ice boxes. The low temperature thermostats are placed in the water pipes or in the air chambers with balanced valves in the brine pipes, and automatic control, without attention and enduring for many years without adjustment, goes into effect forthwith.

The normal cost of producing refrigeration is approximately fifteen times, per degree difference in temperature, the cost of heating a given space. Products requiring refrigeration are often very sensitive to temperature fluctuations. It is, therefore, highly desirable to automatically control refrigeration sources both from the standpoint of economy in cost of producing refrigeration as well as in the safe guarding of the refrigerated products.

DOUBLE THERMOSTATIC CONTROL

A great majority of buildings are heated to normal temperatures from nine to 12 of the 24-hour per day for five days of the week. Many are so heated but six or seven hours Saturday and are not necessarily heated on Sunday, except to prevent freezing. This would indicate that a normal heating week would have 56 hours normal temperature out of 168 hours total or 33⅓ per cent. During the remainder of the time in many parts of the United States, it is necessary to have some heat to prevent freezing or excessive cooling.

It has been demonstrated clearly that it is more economical to carry a building at a temperature somewhat lower than the normal temperature

during the night and periods of non-occupancy than it is to allow the building to cool to a point that requires excessive pressure or heating effect to return it to normal temperature. It has been the practice to sub-divide heating mains so that heat may be furnished to parts of buildings which are occupied during periods when the building is not completely occupied. In this manner, the major portion of the building may be dropped to its economical *unoccupied* temperature.

Thermostatic equipment is now available to satisfy this demand in that each thermostat is provided with two separate temperature sensitive elements either one of which may be selected at will from the boiler room or office of the building. One sensitive element is set at a normal or operating temperature, say 70 deg., while the second temperature sensitive element is set at any lower temperature which it may be desired to maintain at times when the normal temperature is not required, say 50 deg. This apparatus is furnished where desired with individual switches on each thermostat so that the occupancy of any room may restore the temperature of that room to the normal from the low temperature. Thermostats can be so grouped on the air piping that any series of rooms throughout the building may be operated simultaneously from a remote source without the use of separate steam mains and return piping. This apparatus is, therefore, available on many jobs at practically no extra cost when credit is taken for the separate steam mains.

The double system of automatic temperature control assists in maintaining any building at a uniform low temperature throughout the non-occupied period, thereby eliminating the excessive cooling in parts of the building remote from the steam source which are the first to cool and the last to heat. During the past few seasons, economies have been demonstrated amounting to 40 per cent over normal hand operation by the use of the double control apparatus. The double control system is applicable to factories where certain portions of the building must be maintained at a uniform temperature continuously or where operated overtime or unusual periods. It is also applicable to club, school and office buildings.

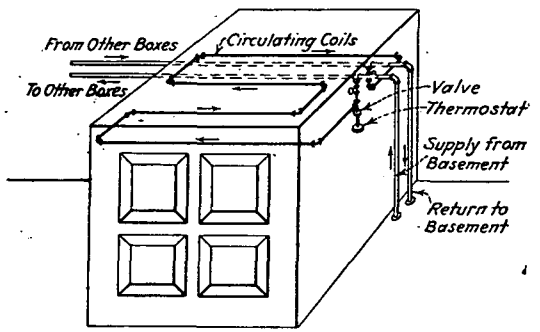


FIG. 12. UNIT THERMOSTAT

Note.—Unit Thermostat on brine refrigeration system automatically controlling flow of brine by temperature of air in box. This installation is also typical of rooms or driers heated by steam or hot water.