

of attached equivalent radiation, based on a heat emission of 240 B.t.u. per square foot.

Anthracite coal weighs approximately 52.5 lb. per cubic foot; bituminous, 45 lb. per cubic foot; and coke, 28 lb. per cubic foot.

HEATING COSTS WITH COAL

In most cases, heating costs with coal are lower than the costs with gas, oil or electricity, even though the efficiency of combustion usually is less than that with gas and oil. At prices of today the cost of coal ranges from about 40 cents to \$1.20 per 1,000,000 B.t.u., giving proper consideration to efficiencies. For comparisons with the cost of other heat sources, see Chapters 11, 12 and 13.

CHAPTER 11

HEATING BY GAS

Original and Conversion Installations; Gas Fired Boilers and Furnaces; Space Heaters; Combustion and Heat Values; Installation Data; Costs to Operate.

THE desirability of gas for heating purposes is quite generally recognized, but the use of this fuel has been limited in many cases because of its higher cost. Hence, one of the problems peculiar to the use of gas for heating purposes is that of fuel utilization. Gas is a fuel with a high thermal value and is easy to handle and control. This ease of control makes possible extreme economy, and gas-burning appliances should, therefore, be designed and selected to take full advantage of this potential economy.

Determination on the part of gas companies that building heating is a desirable load to have on their lines has led to an increasing number of such corporations granting materially reduced rates for gas used for heating purposes. The communities in which reduced rates for heating purposes have been granted are of a widely diversified character as to size, climate, geographical situation and industries. In natural gas territories, the rates, while showing a tendency to increase, are still such that gas is a cheap fuel for any purpose. An increasing demand for efficient gas-burning appliances always follows an increase in gas cost.

The corporations from which gas is purchased usually display a continued interest in the up-keep and efficient operation of the fuel-burning appliance. A large proportion of the gas-burning heating appliances are installed and distributed through gas companies. The gas company then stands ready to see that the purchaser of the appliance enjoys uninterrupted and efficient service from it. A notable development of comparatively recent date is the offering of gas-burning boilers designed for large-scale heating.

CALORIFIC VALUE AND EFFICIENCY

When gas is burned a large amount of water vapor is produced as one of the products of combustion. This ordinarily escapes up the chimney, carrying away with it a certain amount of heat. However, when the heat value of gas is determined in an ordinary calorimeter, this water vapor is condensed and the latent heat of vaporization that is given up during the condensation is reported as a portion of the heat value of the gas. The heat value so determined is termed the "Higher Heat Value" and this is what is ordinarily meant when the heat value of gas is specified. The heat that is reclaimed by the condensation of the water vapor