duces a more secure feeling in the customer's mind when putting in gas-fired house-heating equipment, if he knows that he can burn coal at any time he may desire. For steam or vapor installations, it is desirable to have the water line in both boilers at the same level.

Chapter 29

FUEL CONSUMPTION

Heat Loss, Calorific Values, Heating Efficiencies, Non-Heating Periods, Heat Capacity of Buildings, Miscellaneous Factors, Degree-Day Method, Rough Approximations, Relative Heating Costs

TO predict the amount of fuel likely to be consumed in heating a building during a normal heating season, it is necessary to know the total heat requirements of the building and the utilization factor of the fuel. The accuracy of the estimate will depend on the ability to select these values and on the care taken in making allowances for other variable factors.

Fuel requirements[1] are given by the following general equation:

$$F = \frac{H \times (t - t_a) \times N}{(t - t_o) \times C \times E} \qquad (1)$$

where

F = quantity of fuel required for a heating season.
N = number of hours of heating season corresponding to average temperature, t_a.
t = inside temperature, degrees Fahrenheit.
t_a = average outside temperature, degrees Fahrenheit.
t_o = outside design temperature, degrees Fahrenheit.
H = calculated heat loss of building based on outside temperature of t_o, Btu per hour.
C = calorific value of one unit of fuel, the unit being the same as that on which F is based.
E = efficiency of utilization of fuel, per cent.

HEAT LOSS

The hourly heat loss (H) is equal to the sum of the transmission losses (H_t) and the infiltration losses (H_i) of the rooms or spaces to be heated, and the total equivalent heating surface required is equal to $\frac{H}{240 \text{ sq ft}}$.

In estimating the fuel consumption of a building of more than one room divided by walls or partitions, it is not correct to use the calculated heat loss of the building without making the proper allowance for the fact that the heating load at any time does not involve the sum of the infiltration losses of all of the heated spaces of the building but only part of the infiltration losses. This is explained in Chapter 6.

It is sufficiently accurate in most cases to consider only half of the total infiltration losses of a building having interior walls and partitions, and the value of H in Equation 1 would, under these conditions, be equal to

[1]For further information on this subject see Estimating Fuel Consumption, by Paul D. Close, (*Heating, Piping and Air Conditioning*, May, 1931).