

The preceding table may be used to find the proportionate amount of radiation necessary to heat a room to any desired inside temperature, other than 70 deg., when the outside minimum temperature is other than zero, and with a radiator temperature other than standard. Find the difference between the outside temperature and the room temperature in the first column; divide the proportionate heat loss opposite this amount, in the second column, by the proportionate transmission opposite the difference in temperature between the radiator and the room, as given in the fourth column, and the result will be the proportionate amount of radiation required.

Example.—What is the proportionate amount of radiation required to heat a room to 90 deg., with a temperature of 20 deg. below zero outside, and a steam temperature of 240 deg.

Solution.—The difference in temperature between 20 deg. below outside, and 90 deg. inside, is 110 deg. Opposite 110, the proportionate heat loss or 1.57 is found in the second column. The difference in temperature between the radiator and the room (steam 240 deg., room 90 deg.) is 150 deg. Opposite this, the proportionate transmission 1.09 is found in the fourth column. Divide 1.57 by 1.09 and the quotient, 1.44 is the proportionate amount of radiation required.

THE BOILER

In order to select a boiler to supply sufficient steam for a given amount of radiation there must necessarily be some basis for establishing the steam-producing capacity. To establish such a basis the Society has adopted the Report of the Committee On Code for Testing Low Pressure Heating Boilers (Revision of 1919), which gives a basis for calculating the rating on different firing periods. As will be seen in the Code which is reproduced in full in this volume (page 27) the rating of the boiler in B. t. u. per hour is the product of the number of pounds of dry fuel consumed and the total B. t. u. available at the boiler outlet per pounds of dry fuel, under the test conditions outlined, divided by the duration of firing period in hours.

For house heating installations a firing period of approximately 10 hr. is selected as it permits the fire to be tended only in the morning and evening.

To select the boiler, the total heat emitted by the radiators as calculated above plus that emitted by the piping and connections should be taken as a basis and a boiler selected 50 to 100 per cent. larger than the maker's rating. This factor of safety must be allowed to take care of the decrease in capacity of the boiler under poor draft conditions, soot coated surfaces and inefficient firing, poor quality coal and other conditions which often prevail in the use of such equipment. The ratings given by the manufacturer are under test conditions.

CHIMNEYS

Recommendations for the construction of chimneys and flues have been made in the form of a model ordinance by the *National Board of Fire Underwriters* and approved by the Council of the Society with the exception of the chimney sizes recommended. The ordinance which is reproduced (page 35) shows the sizes that have been recommended by the furnace and boiler manufacturers associations and have been found to give satisfactory service, approval being withheld by the Society only on the ground that they were not as yet considered a recognized standard. The Research Laboratory of the Society is conducting experiments to establish some of the fundamental factors in chimney operation, and the data secured will be published at a later date.