lation as a greater loss in efficiency often results from poor adjustment rather than from poor design. A burner should have sufficient capacity to develop full rating of the boiler and it is preferable that it have some excess; it should also be adjustable over a range from 50 to 100 per cent rating, see Fig. 2. The flame adjustment is best determined by a flue gas analysis but a good check can be made by noting the color of the flame. A white flame indicates excess air or insufficient oil, a red smoky flame insufficient air or excess oil, and an orange flame just tipped with red indicates an efficient and clean combustion. The boiler room should be well ventilated so that the burner can obtain an adequate supply of fresh air at all times.

Burner and tank installation and all electrical work should be installed in accordance with local ordinances. If no local rules are in force the rules recommended by the *National Board of Fire Underwriters* should be followed.

TANK INSTALLATIONS

Tank installation should always be made in accordance with local regulation but usually inside exposed tanks are permitted where the maximum capacity does not exceed 275 gal. This amount may be fed to the burner by gravity if desired and proper precautions are taken to prevent an abnormal flow of oil. These tanks should be installed on non-combustible supports and located at least 10 ft. from the boiler. A very desirable installation is with an outside buried tank, of at least 1100 gal. capacity, preferably located below the level of the burner. Where this is impractical some means must be used to prevent syphoning of the oil from the tank in case of a break in the fuel supply line. There are several devices of this nature approved by the Underwriters' Laboratory. The use of a large tank eliminates the necessity of watching the fuel supply and will often permit fuel to be purchased at a price enough lower to pay for the difference in installation cost. All tanks should be provided with a direct reading gage which gives a constant check on the amount of fuel on hand. Tanks should be located so that the fill line is near the drive or curb so as to facilitate delivery from the tank truck.

CHIMNEY DESIGN

Although slightly less draft is required for oil heating equipment than is required for coal fires and a smaller chimney area would be satisfactory it is recommended that the chimney be designed to meet the boiler manufacturer's requirements as specified for coal burning. It is preferable to have the oil burner flue isolated from other flues as this may be helpful in preventing any mechanical sound from being transmitted to the rooms of the house. A well designed chimney that will insure uniform draft conditions is just as important to an oil burner as it is to a coal fired heating plant. For further data on Chimneys, see Chapter VI.

COMPARATIVE COSTS

Comparative cost figures for various fuels depend entirely upon the heat content of each fuel and the efficiency with which each is utilized.

With oil it is reasonable to assume an increase in efficiency of 10 to 15 per cent over coal. Charts shown in Fig. 3 and 4 gives comparative

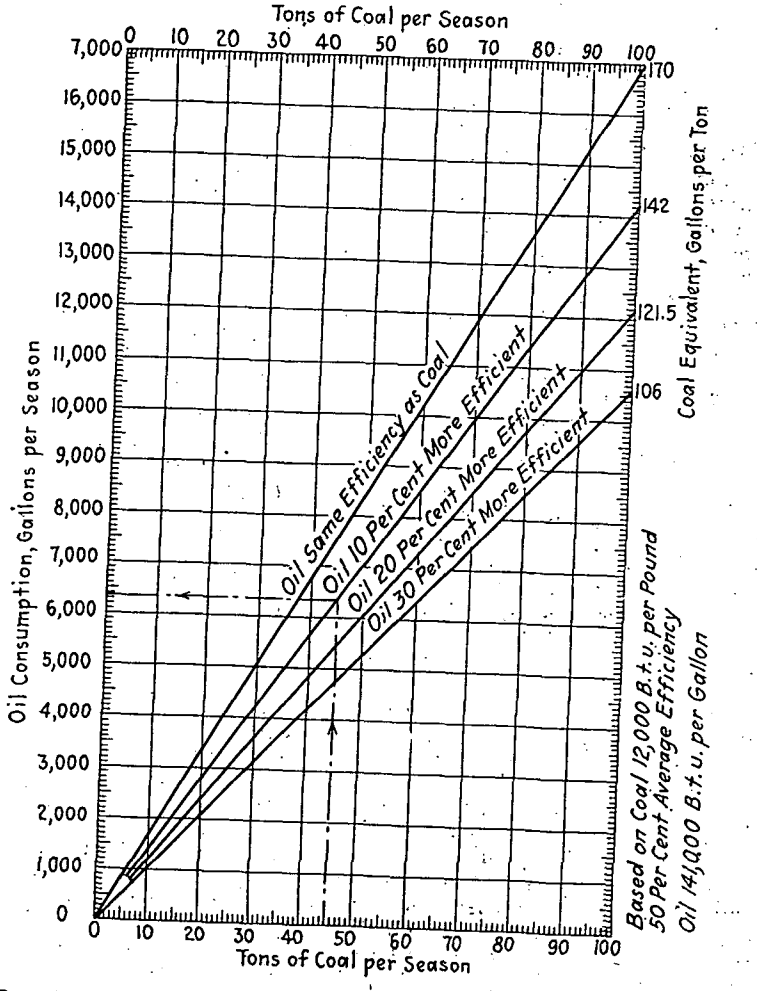

FIG. 3. OIL CONSUMPTION PER SEASON AS COMPARED WITH CONSUMPTION, FOR HEATING

consumption of oil against seasonal coal or gas requirements. These figures are based on an oil containing 141,000 B.t.u. per gallon. By referring to Fig. 2, these figures can be corrected for other grades of oil.