The majority of the burners operate on the intermittent system but there are several that operate on a system known as the high-low where the burner is always burning but the flame intensity is varied to meet the temperature variation as indicated by the thermostat. There is considerable discussion among designing engineers as to the relative merits of the two systems but as the high-low may have the edge during the coldest weather the intermittent burner will be more economical during the milder weather so that over the entire heating season the total amount of fuel used will be very nearly the same.

BURNER INSTALLATIONS

Most burners are installed in boilers designed for coal and the results in most cases are entirely satisfactory. Where a boiler is being purchased for use with oil heating equipment care should be taken to select a boiler that has long flue passes that do not short circuit the gases from the combustion chamber to the flue. There are several boilers that have been designed especially for oil burning that are very efficient and economical. All boilers should be provided with automatic feed water regulator as the boiler is often neglected on account of the automatic features eliminating the necessity of a daily inspection.

With many of the cast iron water tube sectional boilers it has been found possible to increase their rating to some extent by using oil heating equipment. This increase amounts to from 10 to 25 per cent, but boiler equipment should not be selected on this basis without the knowledge and approval of the boiler manufacturer. This increase in rating is usually not possible with round boilers. Where round boilers are used with oil heating equipment it is best to select a boiler that is relatively small in diameter with extra heating surface in the form of intermediate sections.

For warm air installations a furnace of welded construction should be selected as it is more suitable for the conditions imposed by oil heating and will require less attention. Cast iron sectional furnaces will give satisfactory results if care is taken to insure tight joints and a careful inspection made each year.

For hot water supply an indirect heater is quite satisfactory with steam or vapor and with suitable controls on the hot water tank can be used the year round at a very reasonable cost. Small size burners are made that are suitable for installing under small hot water heaters and operating automatically from a control on the hot water tank. A coil in the combustion chamber is not generally satisfactory.

Installations should always be made by trained men as every burner has peculiarities that should be given consideration when the installation is made. It is also important that the burner be correctly adjusted for each installation 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. 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, a red smoky flame insufficient

air and a 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 a good 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

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

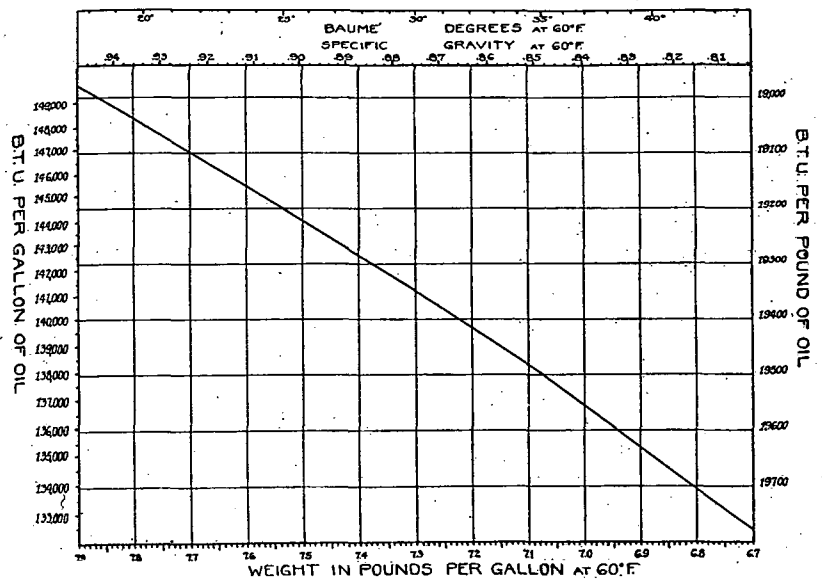

FIG. 3. B.T.U. VALUE OF FUEL OILS

of oil. These tanks should be installed on noncombustible supports and located at least 10 ft. from the boiler. The best 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. Tanks should be located so that the fill line is near the drive or curb so as to facilitate delivery from the tank truck.