

CONTROL FEATURES

One feature of the piping installation that adds to the satisfactory service rendered by gas boilers is provision for adequate and rapid venting of the air from steam heating systems. If air leaks into the steam distribution system during the period that the gas is turned off, and then vents out slowly when the thermostat calls for heat, the result will be a further cooling of the premises between the time that the thermostat calls for heat and the time that steam reaches the radiators. A freely venting steam or vapor system gives maximum economy and minimum temperature variation. When gas boilers are attached to existing heating plants, it is good practice to check the effectiveness of the venting devices and if necessary, replace them with more effective ones that will prevent the return of air into the heating system, and also to check the tightness of the piping.

On account of the ease and effectiveness with which the fuel can be controlled, gas-burning appliances are particularly adaptable to full automatic control. Standard equipment on steam boilers generally includes provision for control through a thermostat, steam-pressure regulation, and safety devices by means of which the gas is cut off either by lowering of the water in the boiler below a safe level, or by extinguishing the pilot flame. Water boilers are adapted to operation under thermostatic room temperature control and are also provided with water temperature control, as well as the safety pilot feature. Warm air furnaces can be under the control of thermostats in the spaces being heated, as well as thermostats located in the heat ducts for the purpose of preventing unpleasantly hot air reaching the heated spaces. Variations in the pressure under which the gas is supplied to the appliance are controlled by means of a gas-pressure regulator. This is a standard part of practically all makes of gas-burning heating appliances.

CROSS-CONNECTING COAL AND GAS BOILERS

Frequently, when a customer already has a coal boiler in his home, it is expedient to leave the coal boiler in place, and to cross-connect the gas boiler with it. Where gas heating is new to the community, it produces 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 so that if desired the gas boiler may automatically take up the load if the fire in the coal boiler goes out.

CHIMNEYS

See Chapter 14 and the material relating to gas appliance chimneys contained therein.

CHAPTER 12

HEATING BY OIL

Fuel Oils; Types and Characteristics of Burners; Automatic Control; Installation Data; Costs to Operate; Domestic Heating; Industrial Heating.

THIS chapter is intended to provide the essential data on the use of oil as a fuel for heating and industrial services.

The advantages claimed for liquid fuel are:

1. Minimum space for storage.
2. Simplicity in location of storage adjacent to burners.
3. Reduction in labor and handling of fuel.
4. Elimination of ash removal.
5. Ease of control of furnace temperatures.
6. Elimination of expense of banked fires.

Each case, however, where the liquid fuel is contemplated, must of necessity, stand on its own merit. The operating cost both with oil and other fuels must be figured and the user will have to evaluate the extra convenience, after which a decision can be made as to what type of fuel should be used.

In the selection of burner equipment and in the determination of storage facilities, it is well to decide what grade of oil is to be used, its Baumé gravity, viscosity, flash point, and cold test, or temperature at which it will cease to be fluid.

The Commercial Standard Specifications of the U. S. Bureau of Standards classify fuel oils according to Table 1.

Oils, Nos. 1, 2 and 3, are used primarily for domestic purposes and do not require pre-heating. The other grades, with the exception of No. 4, are viscous at normal temperatures and require pre-heating for satisfactory operation. For commercial oil burning, oil No. 6 is used when available because of its higher heat content and lower price. Installations for the heavy oil and the labor to operate cost more than those for furnace oils but the lower price and higher heat contents frequently justify their use.

Fig. 1 gives the heat contents of various quality oils, per pound and per gallon.

FUEL OIL HEATING COSTS

The cost of producing heat by the combustion of oil depends upon the calorific value of the oil, the weight per gallon, the cost per gallon and the efficiency with which it is utilized. The efficiency of an oil burner system