source of refrigeration will provide year-round air conditioning. This type of system is particularly adaptable to a *split* system in which a portion of the residence may be conditioned in the winter and summer while the garage, servants' quarters and less freqently used rooms may be provided with radiator or convector heating directly from the boiler in the winter.

A gas-fired winter conditioning unit is illustrated in Fig. 19 which is equipped with apparatus to filter, heat, humidify and circulate the air in a residence. If a cooling coil is added to the arrangement this unit may also become a year-round conditioner.

A diagram of a direct fired fuel oil conditioning unit is given in Fig. 20. A circulating fan forces the filtered air over a heat exchanger through which the combustion gases from the oil burner are being directed. A

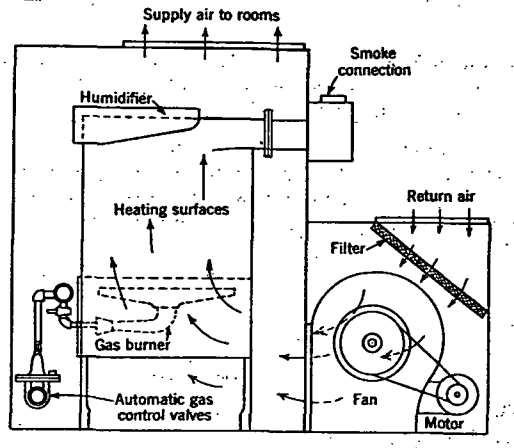

FIG. 19. GAS-FIRED FURNACE CONDITIONING UNIT

cooling section may be placed in the air inlet, with cold water, or refrigerant being circulated through the cooling element. For thermostatic control a room thermostat may be provided to start the oil burner when the temperature falls, and as soon as the temperature in the heat exchanger rises a control mechanism starts the motor operating the circulating fan. As soon as the temperature in the house rises to normal the room thermostat stops the oil burner and the fan.

BASIS OF RATING

In the past, the unit air conditioning industry has been handicapped by the lack of any standard method of rating. A proposed code giving a Standard Method of Rating and Testing Air Conditioning Equipment[5] has recently been prepared.

[5]Loc. Cit. Note 1.

On the basis of this new code, air conditioners are to be classified primarily as *free delivery type* and *pressure type*, where delivery will be measured in cfm standard air at specified fan speed. Pressure type units will specify the delivery against various total fan static pressures. Cooling capacity will be expressed in total Btu per hour and this total will be subdivided into sensible heat cooling effect and dehumidification or latent heat effect. Cooling capacities will be given on entering air temperatures of 85 F, 50 per cent relative humidity with 40 F refrigerant temperature for comfort conditions and 45 F, 85 per cent relative humidity with 30 F refrigerant temperature for commercial applications.

The duty for heating surfaces will be specified in Btu per hour for 70 F entering air temperature based on 2 lb gage steam pressure or 180 F

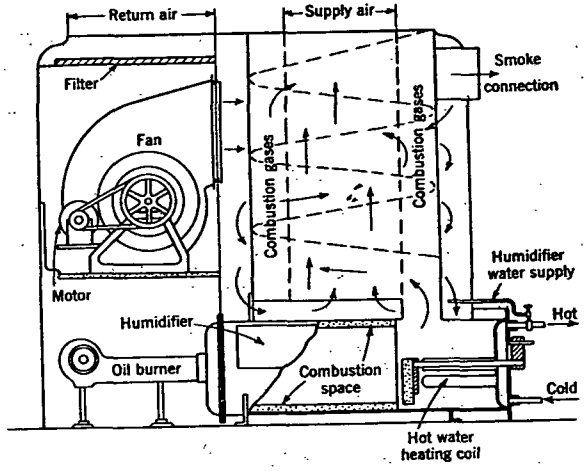

FIG. 20. OIL-FIRED CONDITIONING UNIT

entering water temperature with 20 F drop. Humidification will be specified in pounds of water evaporated per hour at 70 F and 30 per cent relative humidity entering air conditions. The *Catalog Data Section* gives ratings of current models offered by leading manufacturers.

METHODS OF CALCULATING CAPACITIES

The methods of calculating heating and cooling loads for conditioning units are similar to those described under Chapters 7 and 8. Certain manufacturers have adopted simplified and approximate methods which through experience they have found applicable to unitary equipment. Such methods involve certain averaging approximations which are suitable for estimating purposes but many of which require rechecking on a more accurate basis before actual installations are made.

The greatest error in calculating cooling loads is apt to be introduced in the failure to appreciate the magnitude of the latent heat loads and the