explained in Chapter 37, the latent heat of the moisture removed is changed to sensible heat, so that coils must be used as after-coolers to obtain the right dry-bulb temperatures. Factory produced units are also available for use with solid adsorbents such as silica gel.

Another recent development as a manufactured item is the small refrigeration-type dehumidifying unit for the control of moisture in residential basements.

Remote Room Units

For individual rooms, with cooling load requirements of $\frac{1}{2}$ to $1\frac{1}{2}$ tons, remote units are available in attractive casings for installation within the room. A suspended type is shown in Fig. 3 and a floor type, such as is usually installed in place of an existing radiator, is shown in Fig. 5. Furnished with chilled water from a central plant, these units offer a satisfactory method of conditioning existing offices, hotel, and apartment rooms. These units may be obtained with filters and outside air connections, but for most satisfactory application are used as supplements to central systems that supply properly conditioned and filtered air to the areas served.

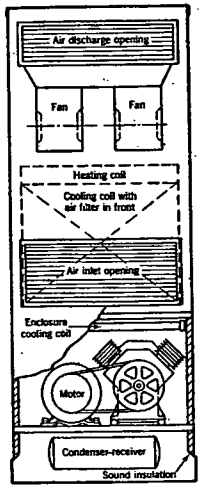

FIG. 6. SELF-CONTAINED WATER-COOLED AIR CONDITIONER

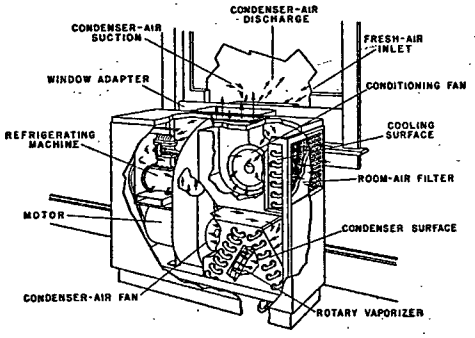

FIG. 7. SELF-CONTAINED AIR-COOLED UNIT AIR CONDITIONER

Induction type units, using primary conditioned air under pressure to induce local circulation, are described in Chapter 29.

Self-Contained Units

A typical large self-contained unit is shown in Fig. 6. It is essentially a remote vertical-type conditioner mounted on top of a sound-insulated enclosure containing the condensing unit. Air distribution is obtained by means of grilles mounted in the discharge plenum, when the unit is located in the conditioned area. Duct distribution of conditioned air can be obtained by removing the plenum, connecting directly to the blower discharge, and safing the top of the unit.

The heat generated by the compression of refrigerant gases and that given off by the electric motor are removed from the compressor compartment in four ways: by the use of a water coil in the compressor compartment; by utilizing the cold suction gases; by drawing part of the return air through the compressor compartment, and finally by circulating room air through the compressor compartment by means of a fan attached to the motor shaft.

Most self-contained conditioners are constructed with enough sound-isolation material for installation directly in the conditioned spaces of the higher-sound-level commercial-type of applications. Special sound treatment means are to be supplied as part of the installation when applying these conditioners to spaces having low sound-level requirements. Conditioners may be installed outside the conditioned area and the connecting supply and return-air ducts can be acoustically treated as required for the specific installation.

Self-Contained Room Cooling Units

Small self-contained units can be obtained with water-cooled condensers, but they are generally air cooled.

The air-cooled types are small in capacity, ranging from $\frac{1}{3}$ to $1\frac{1}{2}$ hp. Their principal application is for conditioning such spaces as hotel rooms, offices and residential living quarters. A duct connection between the unit and an outside window or ventilated air shaft is required to permit disposal of the heat extracted from the conditioned area. The unit may stand in front of the window or be mounted on the window sill. Various styles and types of windows encountered tend to increase the difficulty of making the window connections. The evaporation of condensate on the condenser coils, as a means of disposing of moisture, will tend to increase the condensing capacity and reduce the operating head pressure. Connections to an electrical outlet may be made through a conventional cord and plug or a permanent electrical connection, depending on local code rulings pertaining to the installation of small motors. The exterior finish of the unit in metal, wood or fabric is decorated to harmonize with office or bedroom furnishings. Some room air conditioners are being made for installation in special building openings provided in the walls as part of the initial construction.

A unit of the air-cooled condenser type for floor mounting is shown in Fig. 7. Of the two fans shown, the lower one acts as condenser air fan, and in some units this fan is arranged with slingers for discharging condensate on the condenser coil, while the upper fan discharges air into the conditioned area. A feature of most room air conditioners is that the condensate from the cooling coil is sprayed over the condenser surface and vaporized, thus eliminating the need for drain connections. A simple dampering arrangement is generally provided for exhausting some air from the room, in addition to introducing outside air and recirculating required amounts of air. It is possible to remove the equipment for winter storage or utilize the ventilating features for winter operation.

Controls for Room Cooling Units

Control devices provided for self-contained cooling units generally will include all necessary means for automatic operation. Provision is also made for adding auxiliary external controls, when desired. Remote