means of attached or built-in fans, delivering the conditioned air through a system of ducts which include outside air connections if desired.

Some types of units, mostly those suitable for suspension, employ a propeller fan such as in Fig. 6. These are located in the conditioned area, are without ducts and seldom do more than cool and dehumidify, due to the design of the propellor fan for moving air against low resistance. Generally these units are provided with a lint screen instead of filters to limit resistance to air flow.

Individual floor mounted type remote units are available for use in offices or hotel rooms. Similar in appearance but somewhat smaller in size than the self-contained room unit, this form of equipment may be grouped:

1. Mechanical, year 'round type containing blowers, filters, humidifiers and coils, with outside air connection. Manual or automatic controls provided with each unit.
2. Mechanical, semi-year 'round type with no outside air connection, containing blowers (filters optional), and coils. Usually used where there is an existing radiation or ventilating system. Controls provided with each unit.
3. Non-mechanical type containing coils, using air ejected under pressure from a remote source for inducing circulation over coils (see Chapter 21). Manual or automatic control of air temperature only is provided. Both summer and winter air conditioning functions may be performed by the one unit.

One coil for cooling and heating may be provided or a single coil used, through which hot water in winter and cold water in summer is circulated. All three types of systems require remote sources of refrigeration, with the first group obtaining outside air from the window, the second group having no outside air unless used in connection with a central plant or ventilating system and in the case of the third group, all air delivered under pressure is outside air.

Various combinations or alterations of these room units are available. Different filtering, humidifying and air delivery methods are employed to achieve the desired conditions. A typical remote floor type room unit air conditioner is shown in Fig. 7.

Application

In the application of unit air conditioners it is important to consider several factors:

1. Location of equipment.
2. Air distribution.
3. Multiple units versus central station system.
4. Multiple remote unit system versus a self-contained unit system.
5. Methods of control.
6. Methods of conserving water.
7. Code limitations.

In choosing locations for air conditioning units, consideration must be given to the characteristics and use of the conditioned space; type of system contemplated; duct locations; sources of power, water, refrigeration, heating and drainage; and accessibility of equipment and system for maintenance.

Where units are placed within the conditioned area, particular attention must be given to air distribution, sources of outside air and con-

venience to service sources and facilities previously noted. Skill and ingenuity are required to produce a neat appearing, inconspicuous job without sacrificing quality from an engineering point of view. Furring in of duct work, and building in and refinishing to match existing furniture and fixtures are ways this may be accomplished. Where location of equipment outside of conditioned space is possible, use may be made of storage rooms, halls, basements or any space less valuable than that to be

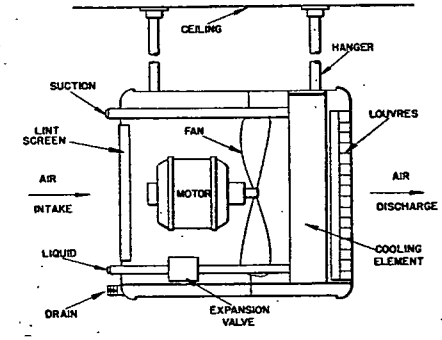


FIG. 6. SUSPENDED PROPELLER FAN TYPE UNIT AIR CONDITIONER

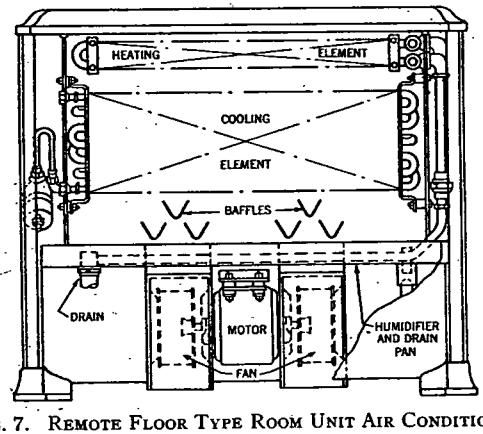


FIG. 7. REMOTE FLOOR TYPE ROOM UNIT AIR CONDITIONER

conditioned. Less emphasis need be placed on the appearance of equipment.

However, choices of equipment location are frequently influenced by such economic factors as long runs of insulated ducts in order to locate units near refrigeration sources, versus short duct runs but long extensions of service facilities. Care must be taken that equipment will not be damaged by climatic conditions.

Air distribution from units located within the conditioned area is by means of grilles, either fixed or adjustable and mounted in air distribution