Having disposed of the accessory central fan conditioning apparatus, the balance of this chapter will concern only the unit air conditioner as defined in Chapter 41.

ADVANTAGES AND USES OF UNIT AIR CONDITIONERS

Unit air conditioners are suitable for commercial and comfort applications because they permit installation without seriously disturbing the building occupants, and they allow rearrangement or a change in capacity to suit changed requirements occasioned by new tenants. Tenants may even furnish their own installations and remove the apparatus from the premises at the expiration of their leases. In some types of buildings, the installation costs are lower for unit conditioners than those for central fan systems, and costs are further lowered in that there is no need for space in which to house a conditioning plant. The choice between unit and

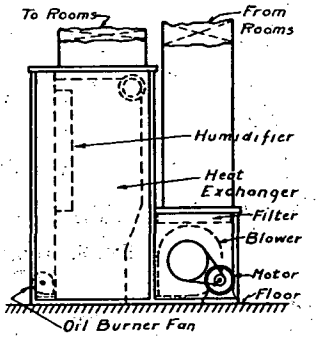

Fig. 5. Oil Fired Unit

central systems will, in many instances, require a close study of installation conditions at the site, and a preparation of comparative cost estimates, in addition to a consideration of the more intangible factors.

Industrial Uses

The origin of the unit conditioner, like that of air conditioning itself, was in the industrial field for maintaining desired atmospheric conditions in rooms or sections of manufacturing plants where structural limitations or service requirements made a central system uneconomic. Industrial applications continue to offer an important market for unit conditioners in bakeries, candy factories, drug-manufacturing plants, laboratories, produce-storage rooms, printing plants, and similar places.

Commercial Uses

The most active field for unit conditioners at the present time is in commercial establishments, such as barber and beauty shops, funeral parlors, retail and specialty stores, and small restaurants, where increased patronage or larger purchases per customer offer economic justification of first cost and operating expense.

The air-handling units installed overhead in Pullman cars, diners and coaches, in the middle or at the ends of the cars which discharge the air horizontally at the ceiling level, are essentially unit conditioners. However, because of special construction to meet space limitations and other requirements, they are unsuitable for general use and are not further discussed.

Personal Uses

The major recent development in the air conditioning industry has been in new and improved types of unit conditioners suitable for apartments, homes, hotel rooms, and offices. These uses demand apparatus that is compact, of unobtrusive appearance and in harmony with the room finish and furnishings, quiet in operation, automatic, and reliable.

As with all new major appliances for the home, problems of relatively high first cost, of comparatively rapid obsolescence and of operating expense demand the continuous close attention of manufacturers and of others interested in developing the potential market. Unit conditioners are still distinctly in the pioneering stage where such problems must be met and solved if development—especially of residential units—is to proceed as fast as it should. Public understanding of residential air conditioning still requires cultivation in order to dispel fears of possible excessive operating costs and of possible high obsolescence due from frequent model changes. Progress in this direction is being helped by the increasing efforts of manufacturing companies which are now spending large sums to insure sound promotion of unit conditioners. Likewise, the *National Better-Housing Program* inaugurated in 1934 is likely to prove of real value to the air conditioning industry and to accelerate greatly the rate of public acceptance and installation of unit conditioners.

FUNCTIONS OF UNIT CONDITIONERS

Unit air conditioners may be classified as the all-year unit, the summer unit, and the winter unit. The *all-year unit* performs all of the functions of an air conditioning system; namely, cooling, dehumidification, heating, humidification, air circulation, air cleaning—with or without a supply of fresh air—and a simultaneous control of all functions. The *summer unit* must provide cooling, dehumidification, air circulation, and air cleaning; the *winter unit* must provide heating, humidification, air circulation, and air cleaning. Either of these seasonal-use units may or may not provide a fresh air supply and a simultaneous control of the functions.

In some instances, winter-type units equipped with filters for air cleaning and with fresh air connections may be operated in summer for ventilation, but the system cannot then properly be said to provide all year conditioning. It is important that the features and limitations of the specific apparatus be carefully explained to a prospective user, so that disappointments and complaints concerning operating results may be avoided.

The functions listed are performed by the unit conditioners offered by different manufacturers in various ways, some of which appear in the following outline. See the next few pages for more detailed explanations of cooling and heating theories and methods.