

In Fig. 20 is shown a conditioning unit which may be operated in conjunction with a hot water or steam boiler. Heat generated in the boiler is supplied to an exchanger which raises the air temperature as it is circulated through the unit. The connection of a cooling coil to a source of refrigeration will provide year-round air conditioning. This type of system is particularly adaptable to a *split* system in which a

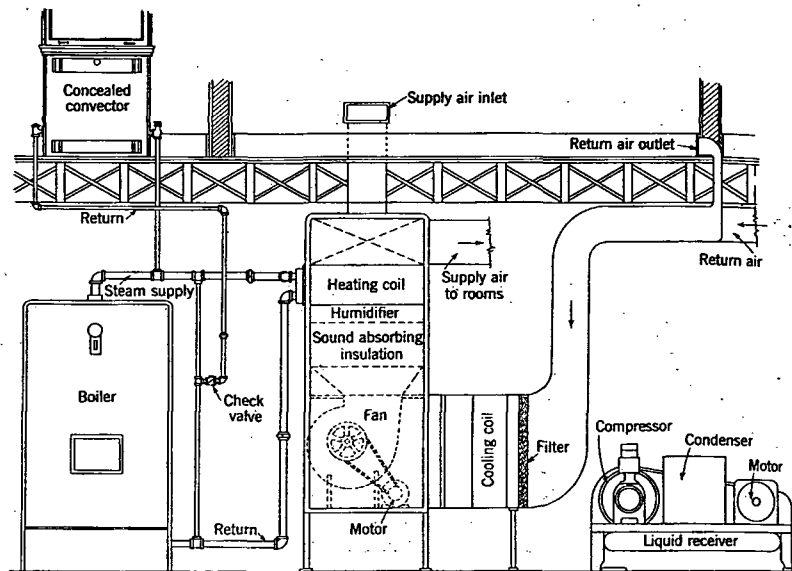


FIG. 20. RESIDENTIAL CONDITIONING UNIT WITH STEAM BOILER

portion of the residence may be conditioned in the winter and summer while the garage, servants' quarters and less frequently used rooms may be provided with radiator or convector heating directly from the boiler in the winter.

Gas-fired winter conditioning units are available 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 oil-fired conditioning unit is given in Fig. 21. A circulating fan forces the filtered air over a heat exchanger through which the combustion gases from the oil burner are being directed. A cooling section may be placed in the air inlet, with cold water, or refrigerant being circulated through the cooling element.

COSTS

Due to the rapid development of the air conditioning industry and the great progress that is being made each year, it is impossible to give any

cost figures that will be of value. There are, however, certain factors that influence the cost of unit air conditioning installations.

1. Since the cost of the total job involves material cost plus installation labor and since through the use of unitary equipment, material costs can be kept to a minimum, every effort should be made to simplify installation.
2. Self-contained units in the small sizes now available, probably represent the lowest cost individual installations. They have, however, their limitations.
3. The floor type all-year-round air conditioning units for the occupied space with a remotely controlled compressor, heating sources being either the existing heat system or steam connections to the unit, probably afford the lowest cost all-year-round service for most individual rooms.
4. For multiple rooms or offices, the remotely located unit with connecting ducts probably represents the most economical installation. The larger self-contained air conditioners are particularly adaptable to stores, residences and small commercial installations.

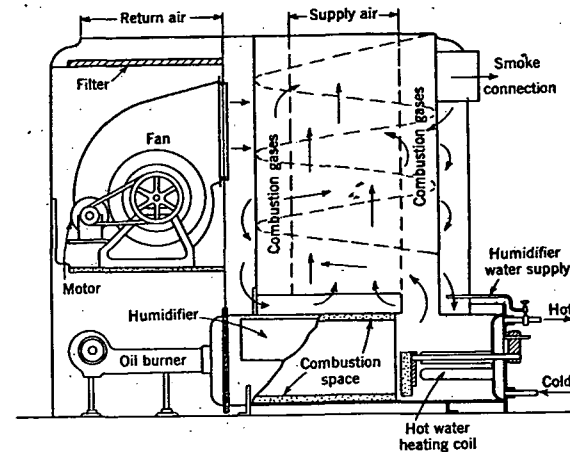


FIG. 21. OIL-FIRED CONDITIONING UNIT

Costs of operation vary widely depending entirely upon the cost of power and water. Water costs in the larger installations are being materially reduced through the use of cooling towers and special types of condensers. The normal expense of operating the cooling system is considerably in excess of that of winter heating both as to the first cost and as to operation. It is difficult to make any comparison of operating costs of cooling vs. heating equipment because the relative operating expense depends upon many factors including climatic conditions; i.e., in the South the cost of operating cooling equipment greatly exceeds the operating cost of heating equipment, whereas in colder climates where cooling equipment is used about two months per year, the heating costs are probably higher than those for cooling. The more rapid growth of air conditioning, at present, has been along commercial lines where it has represented an actual profitable investment resulting in increased business returns and where the first cost and operating cost per occupant is considerably less than in the residential type of application where comfort cooling is still considered a luxury by the ordinary home owner.