

FIG. 14.9. PRIMARY-AIR SYSTEM WITH PLENUM DISTRIBUTION; ROOM HEATER-COOLER COILS AND FANS.

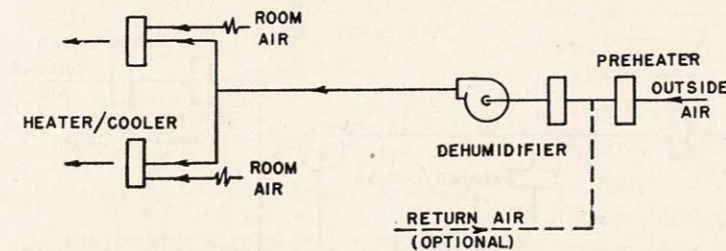


FIG. 14.10. CARRIER CONDUIT WEATHERMASTER SYSTEM USING INDUCTION UNITS IN ROOMS.

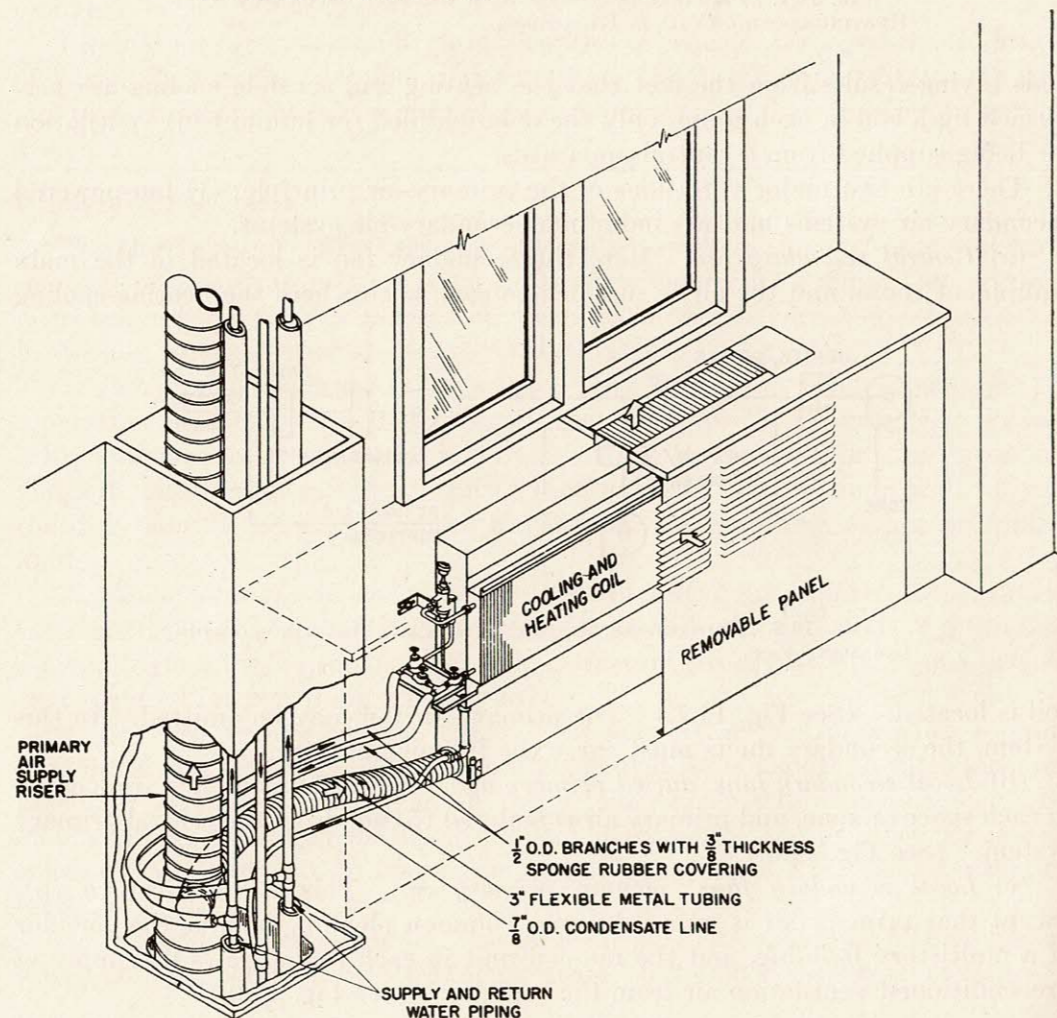


FIG. 14.11. AIR AND WATER PIPING DETAIL—CARRIER CONDUIT WEATHERMASTER SYSTEM.

(d) *Induction secondary air, ducted primary air.* Of the numerous variations on the primary-air principle, the one that has attained the most important commercial position is the Carrier Conduit Weathermaster system for multistory buildings. (See Fig. 14.10.) In this system, ventilation air is cleaned and pre-conditioned to the desired apparatus dew point, then pumped at relatively high velocity (3,000 to 4,000 fpm) through pressure-tight steel conduit to each room, usually through vertical risers located at the outer building pilasters (Fig. 14.11). Since only about one-fifth as much air is required as for a conventional system, conduits are small, varying from 3 to 8 in. in diameter, and considerably higher pressure drops than those suitable for conventional systems may be tolerated without increasing total fan horsepower. In the Weathermaster induction unit, located in the room, the primary air issuing from nozzles at high velocity entrains secondary (room) air over the coil. (See Figures 14.11 and 14.12.) The induction ratio is high, about three or four volumes of room air to each volume of primary air. Fans may be shut down for heating by gravity circulation at night. The water piping is a two-pipe reversed-return system. (See Chapter 8.) The general layout with control for a typical system is shown in Fig. 14.13.

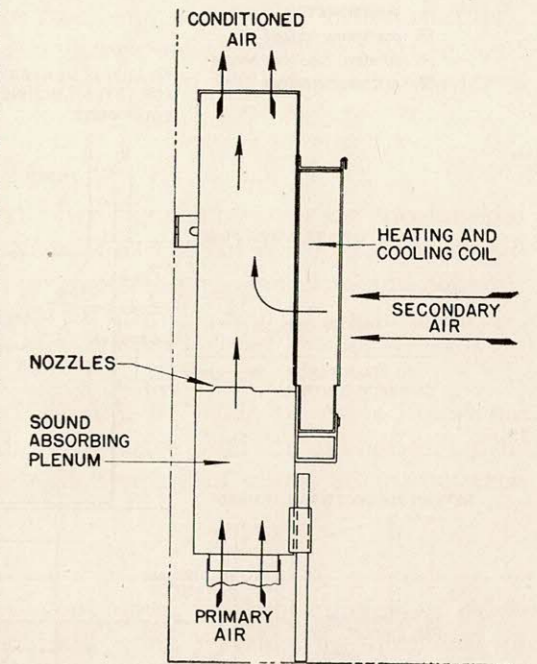


FIG. 14.12. CARRIER CONDUIT WEATHERMASTER UNIT.

FUNCTIONAL ELEMENTS

Depending upon the functions to be performed, a central system includes one or more of the following *functional elements*:

- Fan and drive.
- Hot-water or steam coils for preheating, reheating, or tempering.
- Chilled-water or direct-expansion coils for precooling, aftercooling, or dehumidifying.
- Dehydration equipment.
- Spray equipment for humidifying, dehumidifying, or air washing.
- Air-cleaning equipment—filters or precipitators.
- Actuating and responding controls.

These elements are *connected by*

- (a) Casings, normally of sheet metal, with or without insulation.
- (b) Piping—water, air, steam, drain, refrigerant.
- (c) Electric wiring.