

damper operator No. 5 to open the intake damper from outside. The fan always stops and the damper always closes when the heater is cold.

For additional information on the control of unit heaters, refer to Chapter 35.

Unit Ventilators

The unit ventilator presents a different control problem than the unit heater. Generally this type of unit draws its supply of air from the outside, heats it, and introduces this air into the room under control. There are many types of unit ventilators on the market. Some have a mixing damper by which the temperature of the air entering the room may be

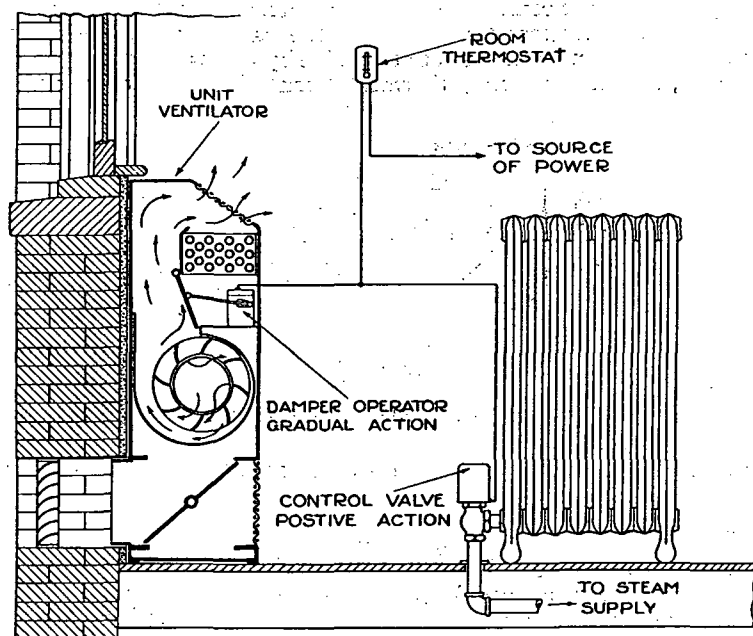


FIG. 8. CONTROL OF UNIT VENTILATOR AND RADIATOR

varied, others have valves for this purpose, and still others use a combination of the two. Regardless of the construction of the machine, the essential requirement is that the temperature of the air delivered to the room should change slowly and remain as near room temperature as possible. Frequently direct radiators are used in conjunction with the unit ventilators to supply additional heat in extremely cold weather or for quickly heating-up the room.

The four general types of control for unit ventilators are as follows:

1. A damper operator, the supply of power to which is controlled by a room thermostat, is attached to the mixing damper. When the thermostat calls for heat, the damper is moved to a position which forces more air through the heating unit and thus increases

the amount of heat supplied to the room. This action must be gradual so that the air temperature may be changed slowly to prevent the drafty condition caused by supplying first hot and then cold air.

2. In mild weather the heating unit frequently supplies sufficient heat to cause over-heating of the room, even though all of the air is by-passed around the heating unit. To avoid this fault a valve is placed on the heating unit to close the steam supply when the damper is by-passing all of the air. This valve is used in addition to the damper operator explained in the foregoing paragraph.

3. In some unit ventilators one or more heating units and no mixing damper are used. A gradual-acting valve on each heating unit controls the supply of steam to the unit to give the proper amount of heat required to maintain the desired room temperature. A thermostat to govern each valve may be installed in the room or one thermostat may be used for all valves.

4. Another type of unit ventilator is arranged so that all recirculated air passes through the heating unit and the outside air is introduced into the room for cooling purposes only. The outside air damper and the recirculated air damper are interlocked

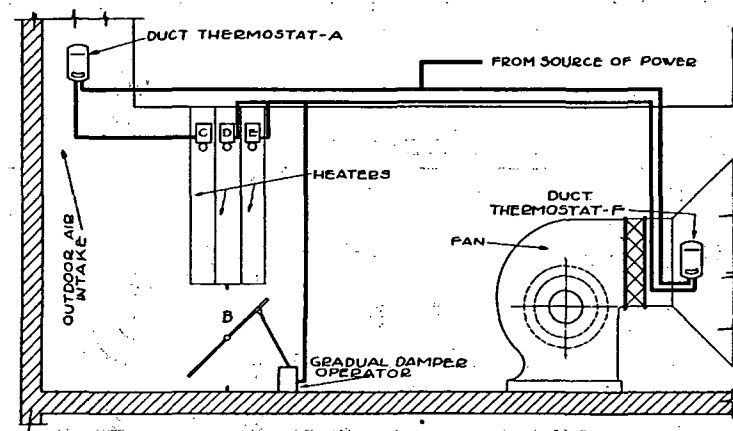


FIG. 9. CONTROL OF A SPLIT SYSTEM OF VENTILATION

so that one damper operator will control them. In addition a valve operator is placed on the heating unit. Both of the operators should be gradual to avoid drafty conditions. When the thermostat calls for heat, the damper operator slowly closes the outside air damper and opens the recirculating damper simultaneously; if this does not meet the demand, the valve on the heating unit opens until the room temperature reaches the desired point.

Fig. 8 shows a unit ventilator which may or may not be used in conjunction with a direct radiator. It is generally considered advisable to shut off the steam to the direct heating surface, if any, first, so that the control system will allow the unit ventilator to supply the full heating requirement where possible. For additional information on the control of unit ventilators, refer to Chapter 36.

Central Fan Systems

The numerous types of central fan systems present many control problems. In general they all have one point in common, namely that the temperature change may be very fast due to rapid circulation.

System for Ventilating Only (Split System). Fig. 9 shows an accepted