

10. Calculate total static pressure for entire system.
11. Select fan, motor and drive from manufacturers' tables. (See Chapter 32).

DESIGN OF DUCTS

The customary practice for the design of ducts for ventilating work should be followed in the design of ducts for fan-furnace systems. The duct sizes may be calculated either on the velocity basis or on the pressure loss basis using the same velocities, temperature ranges and methods used in planning any other system of forced air circulation for heating and ventilation. The type and construction of the building will, of course, determine largely the duct system that can be used most advantageously. (See Chapter 31).

The ratio of the amount of outside air to the amount of recirculated air varies with different types of buildings and with the purpose for which they are to be used, and this ratio is governed by State laws, local codes or the practice of the engineer. (See Chapter 26).

ARRANGEMENT OF HEATERS

Fan-furnace heaters are readily arranged for any combination of one or more heaters in battery. The enclosure casing usually provides a warm air plenum space and a tempered air space for connection to the duct system. (See Figs. 1 to 8, inclusive).

Any variation of the following arrangements may be used:

1. Battery of any number of units with one plenum chamber.
2. Separate batteries of heaters with separate fans and plenum chambers.
3. Heaters in battery with separate division casings and louvres at rear for cut off of air supply to each heater.
4. Tempered air in addition to warm air chamber.
 - a. By recirculating small portion of heated air back to fan inlet;
 - b. By connecting warm air chamber to tempered air chamber with control damper; or
 - c. By mixing cold air below heaters to warm air from plenum chamber.
5. Cleaning air to or from fan by filters or air washers.
6. Humidifying air by water pans, sprays, etc.
7. Connecting to refrigeration apparatus air washers, etc. for cooling.
8. Automatic control of temperature by
 - a. Controlling quantity of heated air entering room;
 - b. Controlling temperature by mixing dampers; or
 - c. Controlling temperature by regulation of fuel.

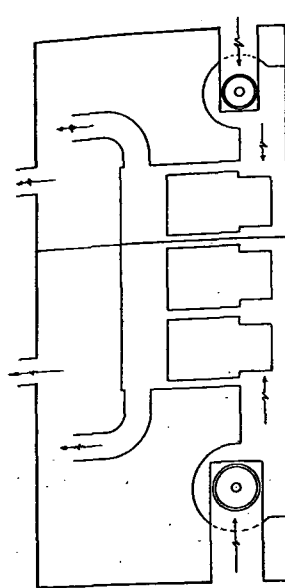


FIG. 2. TWO BATTERIES OF HEATERS AND FANS FOR INDEPENDENT SERVICE USING OUTSIDE AIR AND EXHAUST TO ATMOSPHERE

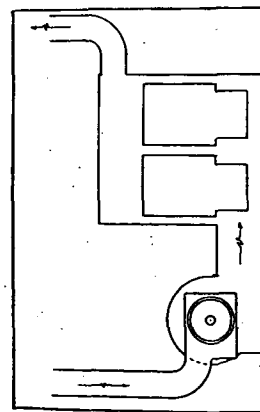


FIG. 1. HEATER ARRANGED FOR COMPLETE RECIRCULATION OF AIR WITH TEMPERATURE CONTROL DIRECT ON HEATER

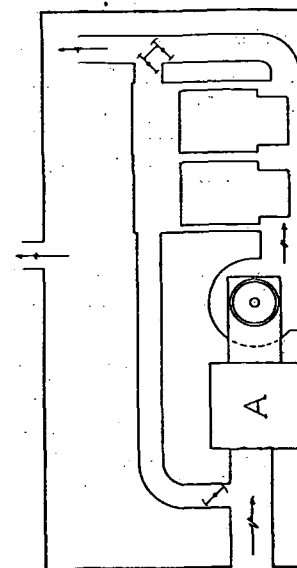


FIG. 4. HEATER ARRANGED FOR USE OF AIR WASHER OR FILTER (A) WITH HEATED AIR TO MIX WITH OUTSIDE AIR FOR TEMPERING, SHOWING MIXING DAMPER FROM WARM AIR AND TEMPERED AIR AND EXHAUST TO ATMOSPHERE

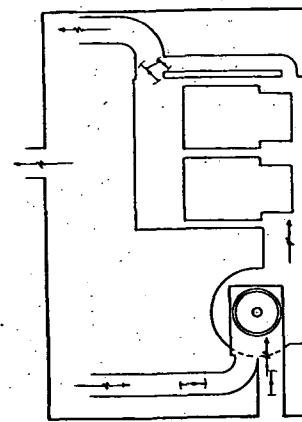


FIG. 3. HEATER ARRANGED FOR PARTIAL RECIRCULATION, ALSO SHOWING MIXING DAMPER FROM WARM AIR AND TEMPERED AIR CHAMBERS, AND PARTIAL EXHAUST TO ATMOSPHERE