

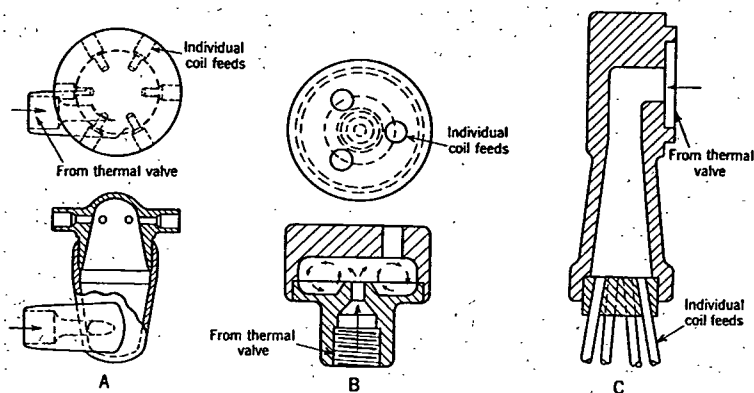


FIG. 5. TYPES OF REFRIGERANT FEED DISTRIBUTING HEADS

handles the same refrigerating load. A distributing means is imposed between valve and coil liquid inlets to divide the refrigerant equally among the feeds. Such a distributor must be effective for distributing both liquid and vapor, because the entering refrigerant is a mixture of the two. Fig. 5 shows three typical types of distributors. In distributor *A* the liquid and gas mixture from the thermal valve is led tangentially into a chamber. The coil feed connections extend outward radially at the top of this chamber. In distributor *B* the refrigerant is discharged at a high velocity through a central jet against the end plate, forming a uniform mixture of gas and liquid within the distributor, from which individual

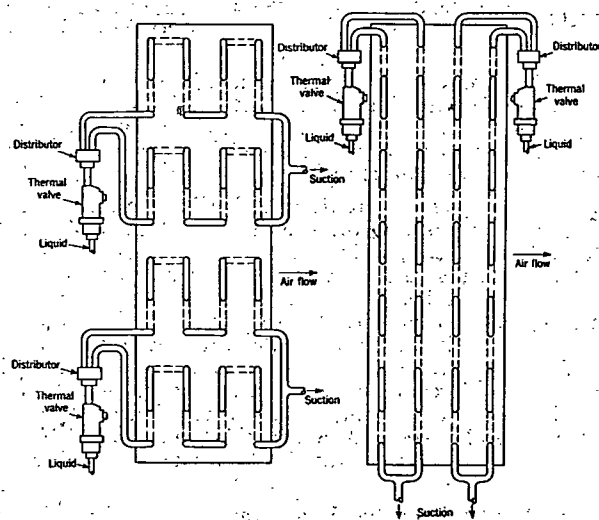


FIG. 6. ARRANGEMENT FOR FACE CONTROL

FIG. 7. ARRANGEMENT FOR DEPTH CONTROL

connections are led as shown. In type *C* the refrigerant enters at high velocity from the thermal valve and is discharged against the end plug in which the individual liquid feeds are closely arranged. These distributors can be used in either vertical or horizontal position. Although there are other forms of distributors those mentioned are typical examples. The individual liquid connections from the distributor to the coil inlet are commonly made of small diameter tubing and are all of the same length and diameter in order to impose the same friction between the distributor and the coil. Since the thermal valves act in response to the superheat at the coil outlet, this superheat should be produced with the least possible sacrifice of active evaporating surface. Sometimes a single thermal valve is used per coil. In other cases multiple valves are used, with the coil divided across the air flow or parallel to the air flow as shown in Fig. 6.

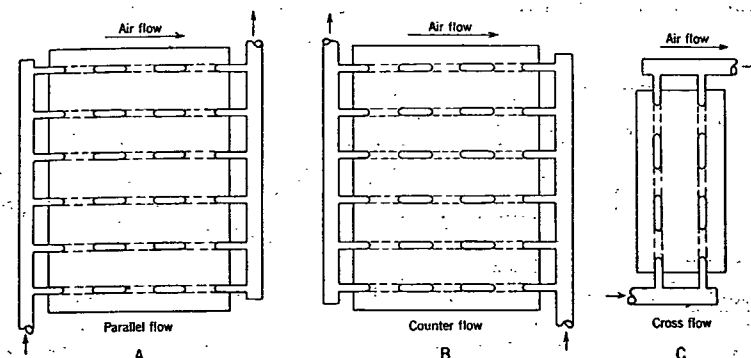


FIG. 8. FLOW OF MEDIA IN TUBES IN RELATION TO AIR FLOW

The arrangement of Fig. 7 should be avoided since it offers the disadvantage of unequal load on the two parallel circuits.

### Flow Arrangement

The relative direction of flow of the air outside the tubes and the medium within them influence the performance of the surface. There are three types of relative flow in common use. Fig. 8A shows parallel-flow in which the air and the medium in the tubes proceed through the coil in the same direction. Fig. 8B shows counter-flow in which the medium in the tubes proceeds in a direction opposite to the flow of air. Fig. 8C shows cross-flow in which the air and the medium in the tubes pass at right angles to each other. The counter-flow arrangement is almost universally used in brine or water coils to take advantage of the highest possible mean temperature difference for given entering water and air temperatures. It is also commonly used in coils fed with volatile refrigerant to take advantage of the higher air temperature for superheating the leaving gas. In deep coils, however, it is sometimes advantageous to use parallel flow from second row to last row and then to complete the circuit by passing through the first row to take advantage of the higher air temperature for superheating. Complete evaporation and superheating of the refrigerant are essential to proper operation of the thermal expansion valve. Cross-flow is common in steam heating