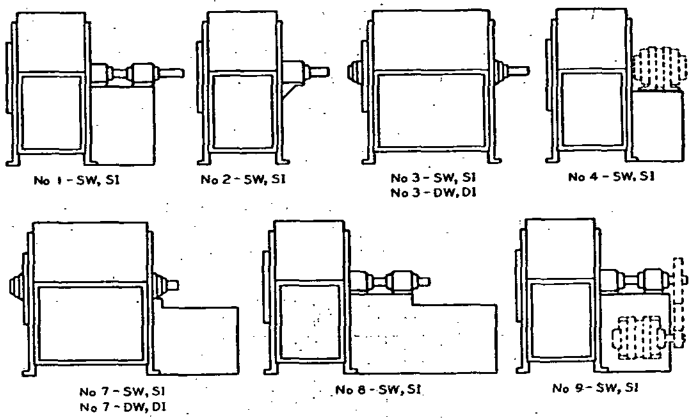

FIG. 6. ARRANGEMENT OF FAN DRIVES

Arr. 1, SW, SI. For belt drive or direct connection. Wheel overhung. Two bearings on base.

Arr. 2, SW, SI. For belt drive or direct connection. Wheel overhung. Bearings in bracket supported by fan housing.

Arr. 3, SW, SI. For belt drive or direct connection. One bearing on each side and supported by fan housing. Not recommended in sizes 27 in. diameter wheel and smaller.

Arr. 3, DW, DI. For belt drive or direct connection. One bearing on each side and supported by fan housing.

Arr. 4, SW, SI. For direct drive. Wheel overhung on prime mover shaft. No bearings on fan. Base or equivalent for prime mover.

Arr. 7, SW, SI. For belt drive or direct connection. Arrangement No. 3 plus base for prime mover. Not recommended in sizes 27 in. diameter and smaller.

Arr. 7, DW, DI. For belt drive or direct connection. Arrangement No. 3 plus base for prime mover.

Arr. 8, SW, SI. For belt drive or direct connection. Arrangement No. 1 plus base for prime mover

Arr. 9, SW, SI. For belt drive. Arrangement No. 1 designed for mounting prime mover on side of base.

upon a system characteristic curve, the relation between the two is at once apparent. The only point common to the two curves is the point at the intersection of the system characteristic curve and the fan characteristic curve, and it is at this point that the combination will operate. In Fig. 5, system characteristic curves A, B and C cross the fan characteristic curve at points X, Y and Z. The fan whose curve is shown, when applied to systems having characteristic curves A, B and C, will deliver 10,000, 13,000 or 16,400 cfm, respectively.

The curves in Fig. 5 also illustrate the effect of errors which may be made in calculating the resistance of a ventilating system. For instance, if a given system requires 13,000 cfm, and the resistance to flow of the system has been computed as 1.25 in. static pressure, such a system would be represented by system characteristic curve B in Fig. 5. If a 100 percent error had been made and the resistance were 2.5 in. instead of 1.25 in., then the system characteristic would be as shown in curve A, and would cross the fan curve at 10,000 cfm. Such an error would cause the flow of air to be decreased from a design volume of 13,000 cfm to 10,000 cfm. If the resistance to flow had been over-estimated and the resistance

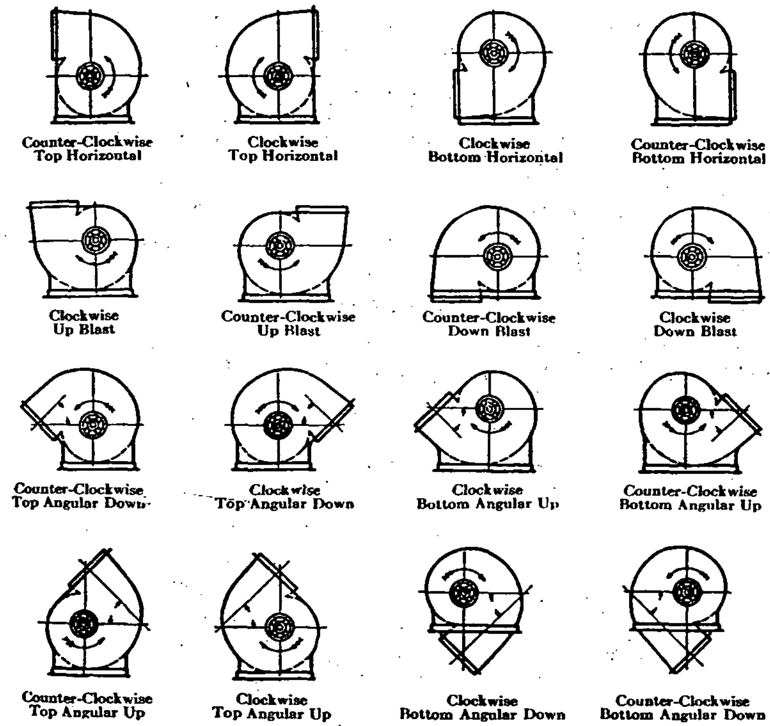

FIG. 7. DESIGNATION OF DIRECTION OF ROTATION AND DISCHARGE

Note: Direction of Rotation is determined from the drive side for either single or double width or single or double inlet fans. (The driving side of a single inlet fan is considered to be the side opposite the inlet regardless of the actual location of the drive.) For fan inverted for ceiling suspension, direction of rotation and discharge is determined when fan is resting on floor.

actually were 0.625 in., the system characteristic curve would be as shown in curve C, and the fan would deliver 16,400 cfm to the system instead of the design volume of 13,000 cfm.

In this example, extreme errors have been selected to emphasize the effect the square function of the system characteristic has in maintaining the fan performance within comparatively narrow limits. In the first example, a system estimated at half what it should have been resulted in a drop of 23 percent in volume; and in the second example, a system estimated at twice what it should have been resulted in an increase of 26 percent in volume.

In some instances fans may be applied to variable flow systems. In such cases, the limiting systems may be plotted and the effect on fan performance examined. For instance, a system might have a characteristic curve between A, shown in Fig. 5, as one limit, and B as the other limit. The fan performance will then fall between points X and Y on the fan curve at a point determined by the system characteristics at that particular