

FIG. 2

FIG. 3

FIG. 4

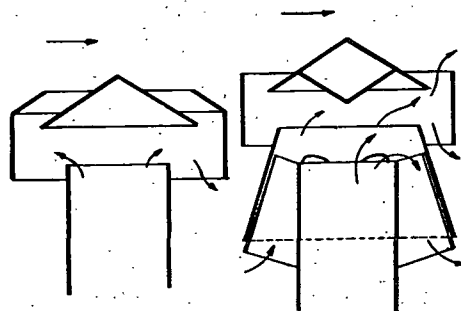


FIG. 5

FIG. 6

FIVE COMMON TYPES OF STATIONARY VENTILATORS

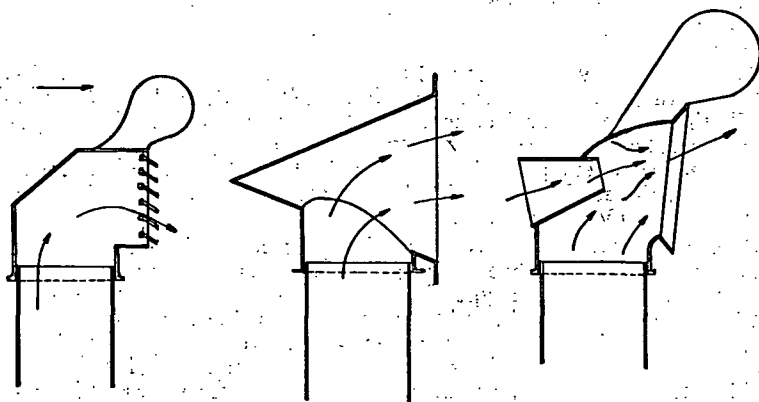


FIG. 7

FIG. 8

FIG. 9

THREE TYPICAL OSCILLATING VENTILATORS

in all sides of the building. With wind, the inductive force at the top of ventilating shafts is more powerful than that on the leeward side of the building, so that air is drawn in through leeward openings by a combination of the forces of wind and temperature difference. On the windward side, the direct forcing pressure of the wind is of course added to the temperature difference effect. Thus forces are available for causing in-flow at practically every window of such a building. Adequacy of stack size must, of course, be provided.

PRINCIPLES OF AIR FLOW CONTROL

The air flow through a ventilation opening depends on the two factors already discussed, namely, (1) the natural forces available, (2) the openings available, and the resistance to flow offered by these openings. The design problem includes, of course, a determination of the *desired air*

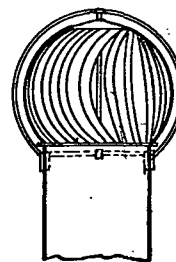
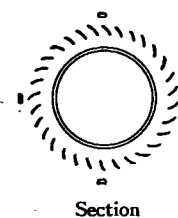


FIG. 10.



Section

ROTATING VENTILATORS

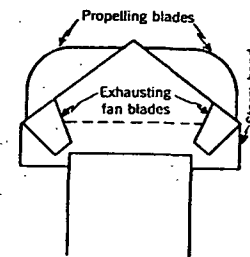


FIG. 11.

quantity and distribution in order that the openings may be properly placed.

The purpose of ventilation is to carry off either excess heat or air impurities, and the desired air quantities depend upon the amount of heat or of impurities present. The amount of heat can be determined, in the case of forge shops for example, from the amount of fuel burned, which in turn is based upon the production capacity for which the building is being designed. In the case of foundries, the heat given off by the metal in cooling from the molten state can be used. In some instances, not all of the heat may be dissipated to the air, but a fair estimate of the amount to be removed by the air can usually be made.

The next step is to select the temperature difference to be maintained. Knowing the amount of heat to be removed and having selected a desirable temperature difference, the amount of air to be passed through the building per minute to maintain this temperature difference can be determined by means of the following equation:

$$H = \frac{c \ 60 \ Q \ (t - t_o)}{V} \quad (3)$$

where

$c = 0.24$ = specific heat of air.

V = specific volume of the air, cubic feet per pound, about 13.5. (See Chapter 1.)