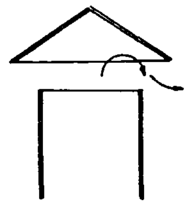


FIG. 2

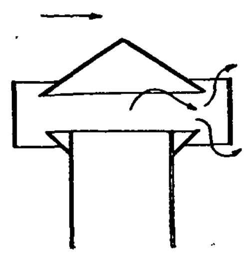


FIG. 3

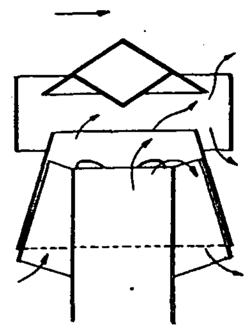


FIG. 4

TYPES OF STATIONARY VENTILATORS

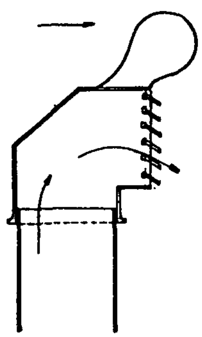


FIG. 5

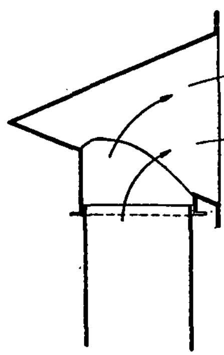


FIG. 6

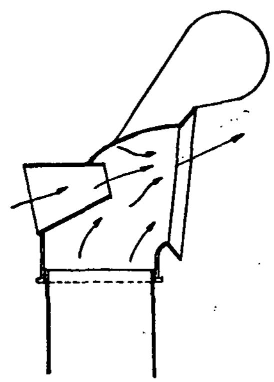


FIG. 7

OSCILLATING VENTILATORS

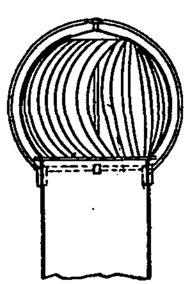
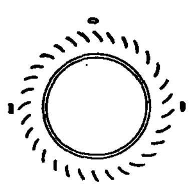


FIG. 8



Section

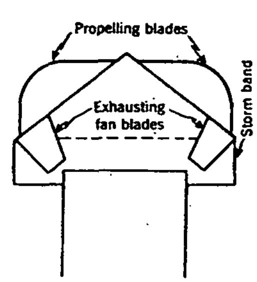


FIG. 9

ROTATING VENTILATORS

tional flow capacity will be produced. The capacity of a ventilator at a constant wind velocity and temperature difference, depends upon four things: (1) its location on the roof, (2) the resistance it and the duct work offers to air flow, (3) the height of draft, and (4) the efficiency of the ventilator in utilizing the kinetic energy of the wind for inducing flow by centrifugal or ejector action.

For maximum flow induction, a ventilator should be located on that part of the roof which receives the full wind without interference. (See Fig. 1.) This does not mean that any ventilators are to be installed within the suction region created by the wind jumping over the building, or in a light court, or on a low building between two high buildings. Ventilators are highly effective in such low-pressure areas, but their ejector action, caused by wind velocity, is of little value in these locations, and hence their size should be increased proportionally.

The base of the ventilator should always be provided with a taper-cone inlet in order to produce the effect of a bell-mouth nozzle (flow coefficient 0.97) rather than that of a square-entrance orifice (flow coefficient 0.60). If a grille is provided at the base of a ventilator it should be oversized as compared with the ventilator size.

Air inlet openings located at lower levels in the building should be at least equal to, and preferably larger than the combined throat areas of all roof ventilators. The air discharged by a roof ventilator depends on wind velocity and temperature difference, but due to the four capacity factors already mentioned, no simple formula can be devised for expressing ventilator capacity.

Several types of roof ventilators are shown in Figs. 2 to 9. These may be classified as *stationary*, Figs. 2 to 4, *pivoted* or *oscillating*, Figs. 5 to 7, or *rotating*, Figs. 8 and 9. When selecting roof ventilators, some attention should be paid to ruggedness of construction, storm-proofing features, dampers and damper operating mechanisms, possibilities of noise from dampers or other moving parts, and possible maintenance costs.

Natural ventilation units may be used to supplement power-driven supply fans, and under favorable weather conditions it may be possible to shut down the power-driven units. Where low operating costs are very important, such a combination has great advantages.

Controls

Gravity ventilators may have dampers controlled by (1) hand, (2) thermostatic, and (3) wind velocity, in combination with a fan. The thermostat station may be located anywhere in the building, or it may be located within the ventilator itself. The purpose of wind velocity control is to obtain a definite volume of exhaust regardless of the natural forces, the fan motor being energized when the natural exhaust capacity falls below a certain minimum, and again shut off when the wind velocity rises to the point where this minimum volume can be supplied by natural forces.

Stacks

Stacks or vertical flues are really chimneys and utilize both the inductive effect of the wind and the force of temperature difference (the so-called