a room which is isolated from the rest of the building, that room alone should be considered. If the air from that room has free access to others below, the total height should be considered. The temperature in the ventilator pipe may be taken as the average temperature from the ventilator outlet to the floor of the room ventilated.

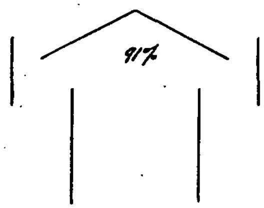

FIG. 62

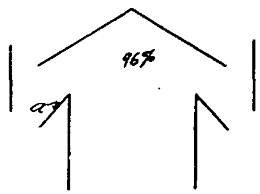

FIG. 63

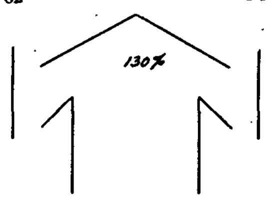

FIG. 64

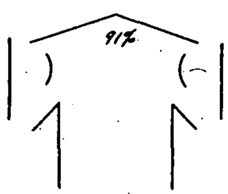

FIG. 65

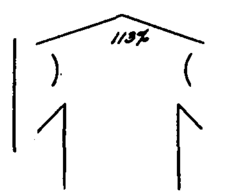

FIG. 66

EFFICIENCIES OF VARIOUS STYLES OF VENTILATORS

The theoretical velocity of the gases due to temperature difference may be obtained from the following well-known formula:

$$V = \sqrt{2gh} = \sqrt{2gH\left(\frac{T^1}{T^0} - 1\right)}$$

in which V = Velocity in feet per second
g = Gravity 32.2
H = Effective height of ventilator
T^1 = Temperature absolute of air in ventilator
T^0 = Temperature absolute of air outside

This gives the theoretical velocity which will be reduced in the practical case by the resistance in the pipe and the ventilator head. It is impossible to state an exact ratio between the velocity obtainable and the theoretical as every case will be different, but a reasonable assumption

would be 50 per cent providing there is free admission of fresh air into the room or space ventilated.

The draft in a ventilator head, due to the velocity of the wind, is primarily caused by the low pressure area or partial vacuum on the leeward side of the ventilator head. A draft in certain designs may also be caused by the siphoning action of the wind passing through the ventilator head, but any air which is allowed to enter the head to create a siphoning action must get out and in so doing will diminish the effective area of the head for exhausting air, and it is also very likely to reduce the effectiveness of the low pressure area.

Naturally the ventilator which makes the best use of the available forces for creating a draft and which at the same time provides the freest

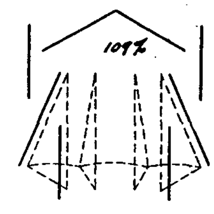

FIG. 67

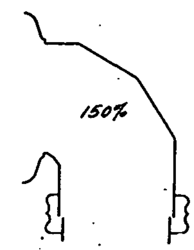

FIG. 68

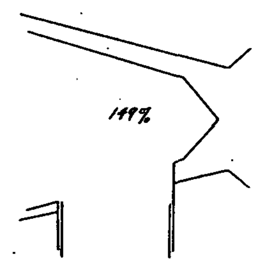

FIG. 69

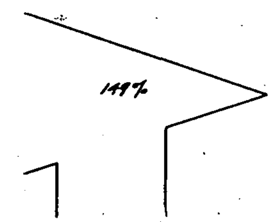

FIG. 70

EFFICIENCIES OF DIFFERENT TYPES OF VENTILATORS

path for the flow of exhaust through the ventilators should be the best ventilator. It does not follow, however, that a ventilator of one class is better or poorer than one of any other class. It may be good or poor not because it belongs to a certain class, but depending upon whether the proper basic principles have been observed in its design. There is not sufficient data available to cover all of the different kinds of ventilators manufactured; yet certain fundamental laws are well established which apply to all ventilators.

Figs. 62 to 66 inclusive, were taken from a preliminary report of tests made at the Bureau of Standards in 1918 on 16-in. ventilators and published in the AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS