

No stoker will handle every class of fuel satisfactorily so that in selecting a stoker the engineer should take into consideration the type best suited for the fuel and operating conditions. Relative to efficiency of combustion, other conditions being similar there will be no appreciable difference with the different types of stokers provided that the proper type is used for the fuel to be burned and the operating conditions are fulfilled.

The duct for forced draft work should be as short and straight as possible and designed so that the maximum velocity pressure under load conditions should not exceed 10 per cent of the static pressure. The air velocity should generally not exceed 2500 cu. ft. per minute. Air ducts are made of heavy steel but concrete ducts are commonly used. Duct sizes are determined in accordance with the general laws of frictional resistance.

CHAPTER XXVI

VENTILATORS AND NATURAL VENTILATION

OF the two methods of ventilating available, namely by mechanical means, and by the so-called natural forces, the later is often favored, because it is not dependent upon fans, blowers and motive power apparatus, any of which may get out of order; it requires no supervision, and it costs nothing for power to operate. It is dependent upon the operation of natural laws and is not subject to the requirements of control possible with mechanical ventilation.

Natural ventilation utilizes two separate agencies, (1) the buoyancy of the air caused by temperature difference between inside and outside of the building, and (2) the energy of the wind. The former is the same action that produces draft in a chimney. The two forces are entirely distinct and separate, and may either co-operate or oppose each other, depending upon the design of the ventilator.

A ventilator is an opening in the roof, properly protected against rain, snow and down draft; and surrounded by a hood or cowl intended to utilize the force of even the slightest breeze from any direction whatsoever, in such a manner as to assist and increase air movement within an enclosure. Occasionally a damper is required to prevent over-ventilation in cold, stormy weather. In any event, openings near the floor of the building which is to be ventilated are necessary to allow the ventilators to act.

Ventilators may be classified in general as stationary and rotary, and each of these may be divided into siphoning and non-siphoning, the rotary ventilator being one which always presents the same face to the wind, and the siphoning ventilator being one which is so constructed as to use the force of the wind to siphon the air out of the ventilator, usually allowing some of the external air to pass through the head.

Engineers, architects and contractors who must make a selection should be guided by the following four general points, (1) quality of material, (2) design, (3) construction and (4) capacity (conditions should be stated otherwise a fair comparison of this item is impossible).

What is generally desired more specifically is, the greatest amount of reliable ventilation for a given cost of equipment. The following facts affect ventilation and ventilator capacity:

1. Temperature difference between inside and outside of building.
2. Height of ventilator above air inlet openings.
3. Wind velocity.
4. Design, shape and proportions of ventilator.

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