3. He can keep the dew-point constant varying the dry and wet bulb.
4. Any combination of the above three.

In any case the improvement will depend solely upon the number of the effective temperature lines crossed.

CONCLUSIONS

Comfort as determined by both sense and physiological reactions depends solely upon effective temperature. At 32 deg. the effective temperature line coincides with the dry bulb temperature line, hence in this particular case dry bulb temperature is the only factor in determining comfort.

In the comfort zone comfort depends equally on wet and dry bulb temperatures.

At about 132 deg. the effective temperature coincides with the wet bulb temperature and for this case the wet bulb temperature is the only factor.

Below 32 the effect of humidity is reversed. The lower the humidity the greater the feeling of warmth.

VENTILATORS

THE term ventilator may apply to anything from an opening through the roof of a building to a pipe with a very complicated covering over the end. As a general rule, it means a pipe leading from the roof of a building covered with some sort of a weather proofing cap. The caps, as used in practice, present a wide variation in design from that of a plain cap to prevent the direct entrance of rain and snow to very intricate designs intended to increase the capacity of a ventilator by a more efficient utilization of the wind energy.

While ventilators may be divided into certain classes or groups and the average efficiency of one class will be higher or lower than the average efficiency of another class, this does not in any way determine the capacity of individual ventilators, as ventilators of the same class and, which from a casual observation appear to be the same, will have entirely different characteristics, due to the fact that some of the fundamentals have been overlooked or changed in one or the other. It is the purpose of this discussion to show some of the basic principles upon which ventilators operate and to show some of the points in practical ventilators which increase or decrease their efficiencies.

Ventilators may be classified in general as, stationary and rotary, and each of these may be divided into siphoning and non-siphoning. The rotary ventilators 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.

PRINCIPLE OF OPERATION

The flow of air in a ventilator pipe is caused by two distinct forces either or both of which may effect the ventilator at a given time. First, the temperature difference between the air in the ventilator pipe and the outside air, and second, the velocity of the wind around the ventilator head. The flow of air caused by either one of these forces will, for a given force, depend upon the design of the ventilator.

A draft is caused by the difference in temperature, the same as in an ordinary chimney. It depends upon the height of the ventilator and the temperature difference. Since a ventilator pipe generally extends only through the roof, the height is not as apparent as it is in an ordinary chimney. The effective height should be taken as that from the ventilator outlet to the lowest point in the room or building ventilated from which the air has free access to the ventilator, *i. e.*, if a ventilator pipe opens into

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Material for this section was prepared especially for THE GUIDE 1923 by F. B. Rowley, Minneapolis, Minn.