The basic principles which should be adhered to are as follows:

1. A reasonably large head, as it gives a larger low pressure area and a better exhaust.
2. A sufficiently large area for the air leaving the ventilator head preferably larger than the cross sectional area of pipe.
3. A storm band on stationary non-siphoning ventilators sufficiently wide and so placed as to prevent the entrance of external air into the ventilator head.
4. If the ventilator is a siphoning type additional outlet air space must be provided in the head in order not to restrict the air passage from the exhaust pipe.
5. Provide a smooth, easy passage of sufficient area for the exit of exhaust air avoiding sharp turns and obstructions.
6. A flaring outlet from a rotary ventilator will give a better exhaust than a straight outlet.

While good or poor ventilators may be constructed of either class, Curves 1 and 2, Fig. 81, shows what may be expected from a well-constructed ventilator in either stationary or rotary type. As a general thing, however, the stationary ventilator will deliver somewhat less than that shown in Curve 2. These curves were taken from a 10-in. ventilator and somewhat better results might be expected from larger ventilators. The curves are based only on draft created by the wind, temperature in the ventilator remaining the same as that outside. The additional draft created by the temperature will depend entirely upon the temperature difference and effective height of the ventilator.

LOCATION OF VENTILATOR IMPORTANT

In order that any ventilator may function properly, some attention must be given to its location on the building. In general the action of the ventilator will be effected by the adjacent buildings height of ventilator, etc., as an ordinary chimney. Thus a ventilator if placed near a high wall would not obtain the full effect of the wind and in case it is on the windward side of the wall, a back draft might even be created in the ventilator.

The access of fresh air to the ventilated room to take the place of the exhausted air must be given consideration in determining the capacity to be expected. If the ventilator leads from a closed room with no air inlets, the capacity will be reduced accordingly.

These are points which must be given careful consideration for each installation and in any case it must be remembered that the capacity of a ventilator of this type is not positive or constant but dependent upon the wind velocity and temperature difference.

AIR CONDITIONING

INTRODUCTION

IT seems that the logical exposition of this subject is the one which most clearly can show the attitude of those expert in it. Like all of the sciences, of which this is surely one, it is made up in its entirety of two parts: *the first*, which is the basis of course, is composed of the fundamental principles and laws, the mathematics, graphs and tables; *the second*, is the application of the science to industry, which constitute, its reason for existing. It has been demonstrated so many times that the science of air conditioning has many ramifications, each of which has its governing law possible of explanation and mathematically reducible to visible and (to the initiated) easily legible chart and table. The development of each of such underlying principles may be made the subject of an article such as this, and at its conclusion the reader will know—only that single phase. The subject should, however, as far as general interest is concerned, be developed from the second rather than the first of the divisions of the science; that is, from its economic side. Only in this way can a general survey be made and an understanding of the value to industry be obtained.

RANKS AS AN IMPORTANT INDUSTRIAL SCIENCE

It may be well to point out here, how essentially an industrial science air conditioning is; being recognized by, and having its great usefulness, through its effects—and not through the means whereby such effects are obtained. So the expert, knowing the principles and the apparatus, and having the background of industrial experience, solves each problem as it is presented, not as a new engineering development painstakingly to be worked out step by step, but surely and accurately—secure in the knowledge that such a treatment of air must, and unfailingly will, produce such an effect upon the material or process under consideration. In the face of such sureness of *effect*, what interest attaches to the means used, in comparison? For it is as true as in manufacturing, in the final analysis, that the finished product is the thing; the ultimate purchaser does not care what the raw materials, or what the process through which they travel. So in this case, not even the delivered *manufactured* air is the goal, but only the materials and the processes as they are changed, modified or varied, by the primary effects of the controlled climate or weather by which they are surrounded.

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