Arr. 5. For Direct Connection.
Single fan. Includes housing, wheel, shaft, bearing on drive side of fan, flanged coupling and base.

Arr. 6. For Direct Connection.
Single fan. Includes housing, wheel, shaft, bearing in fan inlet, flanged coupling and base.

Arr. 7. For Direct Connection.
Single fan. Includes housing, wheel, shaft, two bearings, flexible coupling and base.

Arrangement 1. Fan is of the overhung wheel type with the two bearings mounted on one side and the driving pulley in between. Arrangement 1 is preferred where the

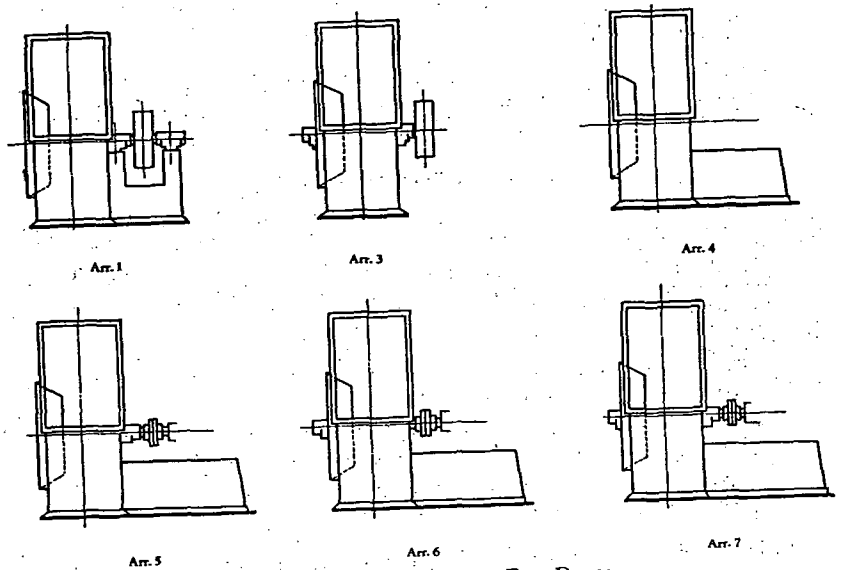

FIG. 8. ARRANGEMENT OF FAN DRIVE

fan exhausts from shafts making the inlet bearing inaccessible. It is also used for high temperatures and other conditions where it would be impossible to locate the bearing in the fan inlet.

Arrangement 3. Is the commonly used fan as it is furnished with a bearing on each side with wheel supported in the center. This fan is arranged for driving with belt which permits the use of high-speed efficient electric motors which can be purchased at a low initial cost. Arrangement 3 can be purchased at a lower initial cost than any other type shown.

Arrangement 4. Fan is used for practically all direct connected work. The fan motor is mounted directly on the motor shaft, the rotor being mounted on pedestal built integral with the fan housing, both motor bearings being easily accessible.

Arrangements 5, 6 and 7. Are used in larger fans where the fan motor is of such weight as to not permit it being suspended on an extended motor shaft.

STANDARD TEST CODE

All fans should be tested and guaranteed in accordance with The Standard Test Code for Disc and Propeller Fans, Centrifugal Fans and Blowers as adopted by the AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS and the *National Association of Fan Manufacturers.*

CHAPTER XXVII

MOTIVE POWER AND CONTROLS FOR FANS

Different Kinds of Motor Drives, Data on Steam, Power, Noise Prevention, Systems of Hand and Automatic Control, Remote Control.

TO make a proper selection of motors for heating, ventilating, drying, air conditioning, exhaust and collecting systems is an important function of an architect's and engineer's work in producing a plant that is efficient and economical. Points to be discussed briefly are fan characteristics, motor selection, methods of drive and general requirements of control as well as other power sources and sound deadening methods.

FAN MOTIVE POWER

Motive power for fans should be determined in accordance with the Standard Code of the AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS, TRANSACTIONS, Vol. 29, 1923; p. 442.

Fans divide themselves into two general classes; the disc or propeller type, and the centrifugal type.

Disc and Propeller Fans

The disc or propeller type of fan is available for conditions of low air resistance, with very short ducts, or no ducts at all. The low speed of the blades near the hubs, compared with the relatively high peripheral speed renders this entire class of fans of low efficiency when overcoming heavy resistance. The air driven by the more effective blade areas near the rim can pass back through the less effective blade areas at the hub more easily than it can overcome the duct-resistance. The power required for such fans increases with the cube of the speed as the speed is increased, and the static efficiency curve falls rapidly at any given speed when the resistance to air flow is increased.

Disc and propeller fans lend themselves to direct-connected motive power, especially as the speeds may be high enough for economical electric motor speeds.

In specifying direct connected electric motors for these fans it should always be remembered that the motor will be subject to the dust and possible high temperature of the material handled by the fan.

Enclosed and specially cooled electric motors are available for this service, and in many types the fan is suspended on the motor shaft.

Centrifugal Fans

The centrifugal, housed type of fan is available for conditions of high air resistance, with heaters, ducts, etc., and is used for systems requiring from one-fourth to two inches or more of water pressure to overcome the air friction.

Material for this section prepared especially for THE GUIDE by S. R. Lewis.