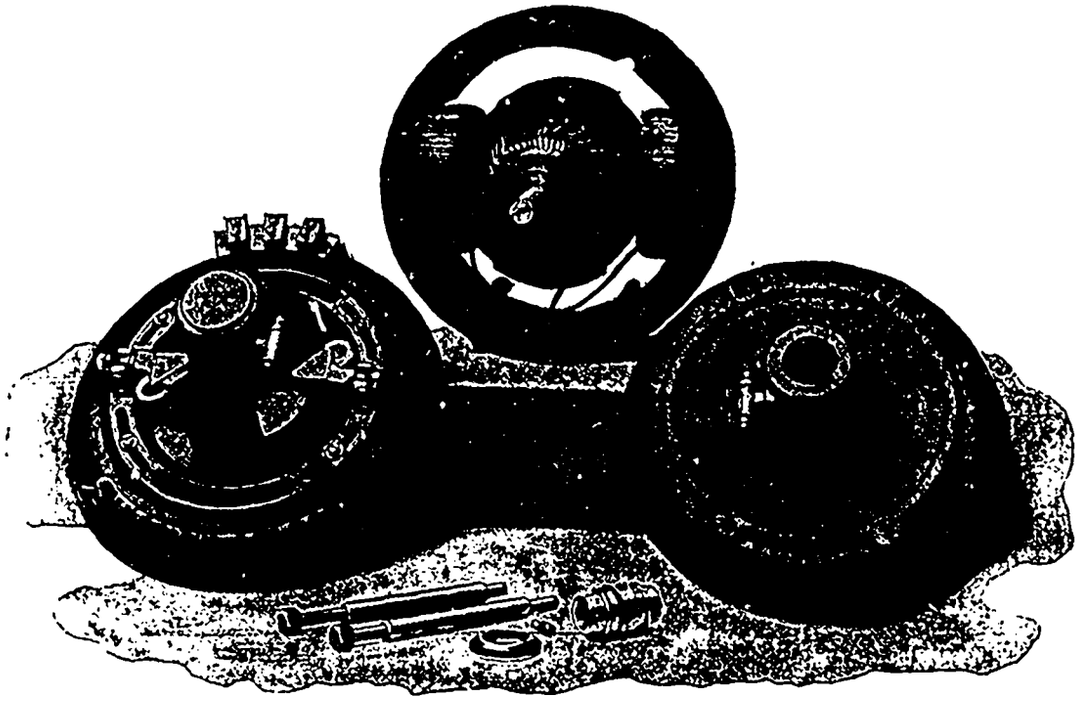
that if the so-called insulating joints properly performed their function, fires from this cause would be extremely rare.

If on the other hand low potential systems are so arranged that there is no chance for high potential currents to rupture to ground, there remains the danger of some person receiving a fatal shock while handling the apparatus. In view of these facts, it would seem advisable to equip all low potential systems, which are exposed to the contingencies herein mentioned, with an automatic device that in time of need will operate effectively.

A NEW TYPE OF ELECTRIC PROPELLER VENTILATING FAN.

Since the B. F. Sturtevant Co., of Boston, Mass., has entered extensively upon the manufacture of electric motors and generating sets, it has been carefully studying the problem of the manufacture of a compact, efficient and convenient type of electric ventilating fan. Exhaustive tests were made with different types of fan wheels. The result is made clear by the accompanying engravings, showing views of one of its electric ventilating fans, which have just been put upon the market. The fan wheel has eight blades rigidly attached to a spider at the



centre, and held in place by a hoop at the periphery, at an angle of approximately 30 deg. The angle is increased in such a manner that as the centre is approached, the theoretical velocity of the air remains practically constant. In other words the delivery edge is helical, and the air is picked up on the inlet edge of the blades at low velocity. When well under the influence of the blades, it is accelerated to its maximum velocity with the least amount of slip. The result is an extremely efficient wheel. The motor likewise has been the result of very careful study in the attempt to provide a light machine, entirely enclosed, and at the same time to avoid the excessive temperature which is incident to the operation of most enclosed motors. The result is a machine capable of continuous operation for ten hours, with a maximum temperature rise of not exceeding 30 deg. F. A practical efficiency of over 80 per cent is obtained even with the small sized motors, and an excess load of 75 per cent. above the rated capacity may be carried without sparking, and without changing of brushes. This feature, combined with the small temperature rise, allows of carrying temporary overloads with impunity. The bearings are self-oiling and self-aligning, and are fitted with phosphor-bronze sleeves, which are removable from the outer ends of the boxes. The wheel is partially enclosed in a conoidal inlet ring, which decreases the frictional resistance to the entering air, and furnishes at the same time a rigid support for the motor, to which it is attached by the tripod hanger. These fans are built in sizes from 18 inches to 120 inches, with motors designed for either medium or maximum speed, and to run at any ordinary direct current voltage. A speed controller is always provided by means of which the fan can be efficiently operated at different speeds.

THE PRACTICAL MAN.

To find the proportions of a toothed wheel.—Pitch of teeth = circumference of pitch circle ÷ number of teeth; number of teeth = circumference of pitch circle ÷ pitch of teeth. circumference of pitch circle = pitch of teeth x number of teeth.

To find the diametral or Manchester pitch.—Divide the number of teeth in wheel by the diameter of pitch circle in inches.

To find the angular velocity of a wheel.—(1) Multiply the circumference of wheel by number of revolutions it makes per minute and divide by 60 = linear velocity in feet per second; divide linear velocity by radius of wheel = angular velocity. (2) Multiply number of revolutions per minute of wheel, 360°, and divide by 60 = angle described by wheel in one second; divide this angle by 57.296° = angular velocity.

To find revolutions per minute of a driving or following wheel or disc.—Revolutions of driver = revolutions of follower x diameter of follower ÷ diameter of driver; revolutions of follower = revolutions of driver x diameter of driver ÷ diameter of follower. Note.—The number of teeth may be taken instead of diameter of wheel.

To find the diameter of a driving wheel or following wheel