The present invention relates to fans for cooling dynamo electric fans, and to a method of making such fans.

Radial ventilation is in general use for cooling induction motors. In this type of ventilation, the air is drawn into the machine by blowers on one end or both ends of the rotor, through openings in the end-brackets, and forced around the coil heads and out through vents near the outer periphery of the stator frame or end brackets. On account of the overhang of the coil heads and the resulting tendency of the ventilating air to spill back the use of some sort of circular deflector or baffle in the end bracket has been found to increase materially the effectiveness of the fan. The deflector is usually placed so as to extend from the face of the bracket inward to reasonably close clearance with the fan, so that the output air of the fan is forced around the coil heads rather than allowed to spill back into the fan intake current. In some cases the fans have been shrouded to stiffen the blades and prevent spillage of air from the sides of the blades.

The present invention relates to this type of ventilation, but replaces the deflector, hereinafter attached to the end bracket, by a circular member which is made a part of the fan and revolves with it, being axially long enough to extend well past the end of the coil heads and thus cause the ventilating air to go where it is most effective.

This design of combined fan and deflector offers a number of advantages. Chief among these is the case with which such a fan can be manufactured. It is possible to make one-piece fans of this type from a strip of suitable material, by simple punching and bending operations. A die which punches and bends one blade at a time may be used, and as many blades incorporated in the fan as are desired. Different diameters can be produced by regulating the length of strip. Different widths of deflector are provided by varying the width of the stock.

This same principle can be used for making fans differing in details from the drawings, such as tilted-shroud or non-radial-blade types. The fundamental principle is the blanking out of a fan in the form of a strip and forming this strip into the circular fan. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawings:

Fig. 1 is a vertical section of a fragment of the rotor of the dynamo-electric machine showing the completed fan attached thereto;
Fig. 2 is a plan of a blank from which a fan is to be formed after the punching operation;
Fig. 3 is a perspective view of the fragment of such blank after the bending operation; and Fig. 4 is a side elevation of a completed fan.

The shaft 1 of a dynamo-electric machine has keyed or otherwise fastened to it a rotor 2 to which is attached a fan generally indicated at 3. Said fan comprises a shroud or deflector portion 4 and a plurality of blades 5 having extending therefrom lugs 6 adapted to be welded or otherwise secured to the end plate 7 of the rotor 2. In the manufacture of such fans a plain metal strip is punched to the shape shown in Fig. 2, and then is fed into a bending machine in which the blades 5 are bent to the position shown in Fig. 3 and the projections 6 are bent at right angles to the blades 5. These fans may be made in large quantities by a continuous machine, the blank strip being fed into the punch press from a roller or spool and thence directly into a bending machine. The formed strip may then be fed into a shear and cut into suitable lengths. Each length is then formed into a circle and the ends are secured together as by spot welding as indicating at 8 in Fig. 4.

The fans may, of course, be manufactured by a non-continuous process, in which case the strip would be cut to suitable lengths be-
fore the punching and bending operations.

Each blade is provided with an aperture 9 adapted to receive balancing weights (not shown) for compensating for variations in thickness and resultant variations in weight of the various blades.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A fan for dynamo-electric machines comprising a plurality of blades terminating in portions extending at right angles to the axis of such machine adapted to be secured by such portions to the rotor of a dynamo-electric machine, and a cylindrical deflector integral with and extending axially beyond the opposite ends of said blades.

2. A fan for dynamo-electric machines comprising a cylindrical member, a plurality of laterally extending blades substantially radially bent from said member, each of said blades terminating in a laterally extending lug adapted to be secured to the rotor of a dynamo electric machine.

3. A fan for dynamo-electric machines comprising a cylindrical member and a plurality of laterally extending blades radially bent from said member, each of said blades terminating in a laterally extending lug adapted to be secured to the rotor of a dynamo electric machine, and each of said blades being formed with an aperture substantially centrally located therein, and adapted to receive a balancing weight.

Signed by me this 30th day of August, 1927.

S. BLACKWELL TAYLOR.