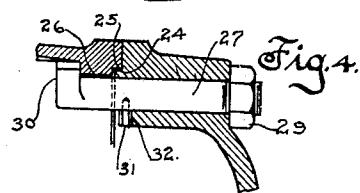
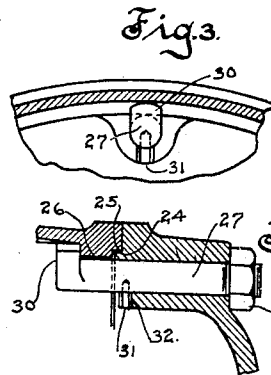
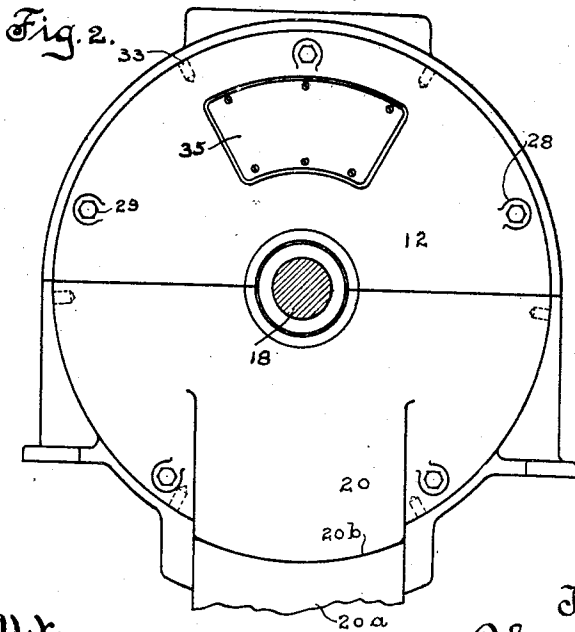
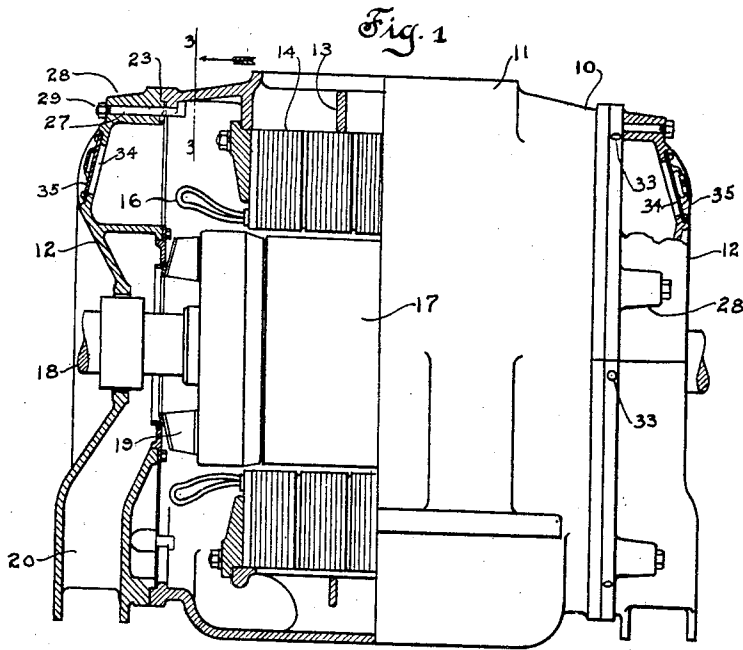


C. E. SEARCH.
DYNAMO ELECTRIC MACHINE.
APPLICATION FILED MAR. 27, 1909.

972,929.

Patented Oct. 18, 1910.



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DYNAMO-ELECTRIC MACHINE.

972,929.

Specification of Letters Patent.

Patented Oct. 18, 1910.

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To all whom it may concern:

Be it known that I, CHARLES E. SEARCH, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is a full, clear, and exact specification.

This invention relates to dynamo-electric machines, and particularly to those machines such as turbo-generators which are inclosed in housings or casings provided for the purpose of deadening the noise incident to high speeds of rotation and also to secure adequate ventilation.

It is desirable at times to inspect, repair, or clean certain parts of such machines, particularly those parts which project into the annular chambers or spaces between the end covers of the housing and the stationary and rotary members, but as the machines are usually constructed, access can be obtained to those parts only by removing the end covers. The removal of these end covers is a difficult matter, however, on account of the proximity of the bearing pedestals and because certain parts, such as collector rings, oil slingers, etc., are mounted on the shaft adjacent to the end covers and between the latter and the bearing pedestals.

One of the objects of my invention is to so construct the housings and particularly the end covers and the portions of the yoke which are adjacent to or are engaged by the end covers, so that access can be readily had to parts on the interior of the housing without necessitating the removal of the end covers.

A still further object is to provide means whereby the end covers can be readily turned through any angle without any danger or possibility of axial displacement of the end covers while the latter are being turned or after they have been turned from the normal positions.

In carrying out my invention, I so construct the housing that the end covers have annular bearings on the ends of the yoke, and provide clamping devices, preferably in the form of special clamping bolts, which hold the end covers and yoke together either in relatively fixed positions or loosely so that the end covers can be turned through any angles, but which do not interfere with the turning of the end covers, although they

eliminate any danger of accidental axial displacement thereof. I also provide in each end cover a manhole, which, together with the unlimited angular adjustability of the end covers, affords access to any part which would be exposed if the end covers were removed.

My invention may be further briefly summarized as consisting in certain novel details of construction and combinations and arrangements of parts which will be described in the specification and set forth in the appended claims.

Reference is had to the accompanying sheet of drawings, in which—

Figure 1 is a side elevation of the machine constructed in accordance with my invention, parts being broken away and in section to more clearly show the construction; the machine which I have here shown being a turbo-alternator with stationary armature and rotary field magnet; Fig. 2 is an end elevation of the same; Fig. 3 is an enlarged fragmentary sectional view taken substantially along the line 3—3 of Fig. 1 looking in the direction indicated by the arrow; and Fig. 4 is an enlarged sectional view showing one of the clamping bolts in side elevation.

Referring now to the figures of the drawing, 10 represents the housing which consists of a yoke or large main or middle portion 11, and two end covers 12 which are supported by, and are secured to, the ends of the yoke in a manner to be explained presently. The yoke 11 is provided with inwardly extending ribs 13 on which is supported the laminated stator core 14 provided with a winding having end portions or end turns 16 which project outwardly beyond the core into annular chambers or spaces between the end covers and the ends of the core.

At 17 is shown the rotor secured to the shaft 18 which extends outwardly through suitable annular openings in the end covers. This housing, as stated before, deadens the noise due to high rotation and at the same time permits a proper circulation of air through the machine. The circulation of air is maintained in this case by means of fans or blowers 19 on the ends of the rotor, the air being supplied to the housing through conduits 20 which, when the end covers are in normal position, extend from

the bottom of the housing upwardly to and around the shaft. The lower ends of the conduits 20 connect with air supplying pipes or conduits 20^a which extend upwardly through the floor of the building, and one of which is shown in Fig. 2.

The ends of the housing and of the end covers have adjacent flat faces which are in engagement with each other as shown at 23, and the yoke is provided at the ends with annular grooves or recessed portions 24 which are engaged by flanges or shoulders 25 on the end covers, and which form bearings for the end covers. These bearings, being annular and cylindrical, permit the end covers to be turned relative to the yoke. The yoke is also provided adjacent the end covers with internal flanges 26 which cooperate with the clamping devices which hold the yoke and end covers together either in relatively fixed positions, or loosely so that the end covers may be turned, depending upon the positions or the adjustment of the clamping devices. The clamping devices consist, in this case, of bolts 27 which pass through lugs or enlarged portions 28 provided at intervals in the end covers, and extend axially inward across the cylindrical surfaces of the flanges 26. The bolts are provided at their outer ends with clamping nuts 29, and at their inner ends with projections or clamping feet 30 which extend radially outward and engage the flat annular faces of the flanges 26 of the yoke. Any suitable means may be provided for preventing the turning of the bolts relative to the end covers, but I prefer to employ for this purpose pins 31 which are fixed in the bolts and project radially inward into slots 32 in the end covers. This construction, as will be readily seen, permits the end covers to be turned relative to the yoke for the reason that the latter has cylindrical bearing portions for the end covers, and for the reason that the bolts engage only the flat faces of the flanges 26 of the yoke, and therefore cannot interfere with the turning of the end covers no matter through what angle, or how far they are turned. The lower ends 20^b of the conduits 20 are curved on arcs of circles, the centers of which coincide with the centers of the shaft so that these ends of the conduits will not prevent angular movements of the end covers. The latter are adapted to be turned by means of levers or rods which may be inserted in radial openings 33 provided at intervals in the periphery of each of the covers. These openings are shown by dotted lines in Fig. 2. In order that access may be readily had to any of the parts which project from the ends of the stator or rotor, as the end covers are turned, each of the latter is provided with a man-hole 34 which is normally closed by a cover or lid 35 and is of a size such that

a workman can clean or adjust or repair the parts within the housing, such as the coils or fan blades, nearly as well as if the end covers were removed. The fact that the end covers can be turned through any angle is of considerable importance also for the testing of the machine.

I do not desire to be confined to the exact details shown and described, but aim in my claims to cover all modifications which do not involve a departure from the spirit and scope of my invention.

What I claim as new is:

1. In combination, in a dynamo-electric machine, an inclosing housing comprising a yoke or main portion and an end cover, said yoke having an annular portion which supports the end cover and on which the latter may be turned, and clamping devices which hold said end cover tightly against the yoke or loosely so that it may be turned relative to the yoke through any angle.

2. In combination with the movable and stationary members of a dynamo-electric machine, an inclosing housing comprising a yoke or main portion and an end cover, said yoke having an annular bearing portion for the end cover and on which the latter may be turned, and clamping bolts carried by one of said parts and engaging the other, said bolts holding the yoke and end cover tightly together or loosely so that the latter may be turned through any angle, depending on whether the bolts are tightened or loosened.

3. In combination in a dynamo-electric machine, an inclosing housing comprising a yoke or main portion and end covers having bearings in the yoke which permit the end covers to be turned, said yoke having internal flanges adjacent the end covers, and clamping bolts extending through the end covers and having portions engaging the flanges, said bolts being movable relative to said flanges so that when the former are loosened the end covers may be turned through any angle.

4. In combination with the rotary and stationary members of a dynamo-electric machine, an inclosing housing comprising a yoke or main portion and end covers, said yoke having at its ends cylindrical portions which are engaged by corresponding portions of the end covers and form bearings therefor, and means for holding said end covers to the yoke so that the former may be turned through any angle, said means comprising shoulders on the yoke adjacent the end covers, and bolts extending through the latter and having outwardly projecting portions which engage said shoulders.

5. In combination, in a dynamo-electric machine, an inclosing housing comprising a yoke or main portion and an end cover, and means carried by said end cover securing the

latter to said yoke, said end cover being adapted to be turned through any angle with respect to said yoke and having a man-hole through which access may be had to different parts of the interior of the housing.

6. In combination with the movable and stationary members of a dynamo-electric machine, an inclosing housing comprising a yoke or main portion, and end covers which are supported by the ends of the yoke and may be turned relatively thereto, clamping devices carried by said end covers and which hold said covers either tightly against the

same or loosely so that the end covers may be turned through any angle, and said end covers having man holes which permit access to parts of the interior of the housing at different points about the machine structure.

Milwaukee, Wis., March 9, 1909.

In testimony whereof I affix my signature, in the presence of two witnesses.

CHARLES E. SEARCH.

Witnesses:

H. C. CASE,
CHAS. L. BYRON.