

A. M. GRAY.
INDUCTION MOTOR.

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1,011,944.

Patented Dec. 19, 1911.

Fig. 1

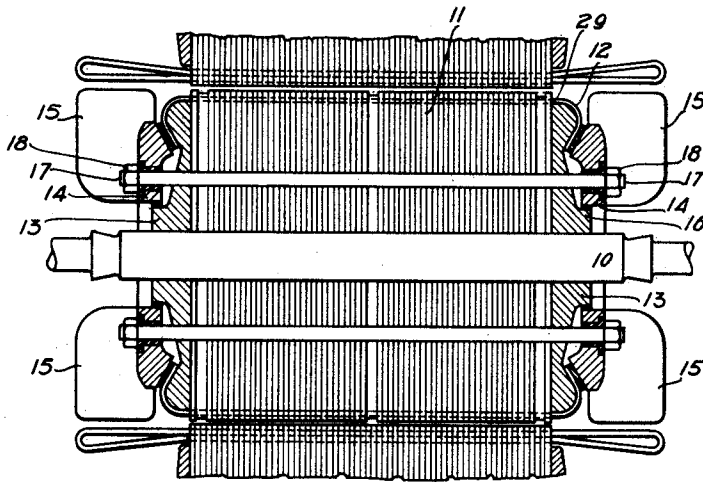
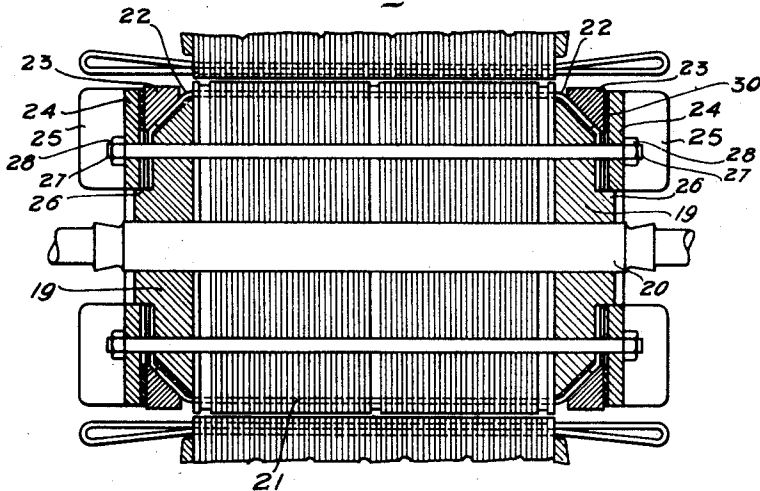


Fig. 2



Witnesses:

Rob. E. Hall.

Chas. L. Byron

Inventor

Alexander M. Gray

By Chas. E. Lord
Attorney

UNITED STATES PATENT OFFICE.

ALEXANDER M. GRAY, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO ALLIS-CHALMERS COMPANY, A CORPORATION OF NEW JERSEY.

INDUCTION-MOTOR.

1,011,944.

Specification of Letters Patent.

Patented Dec. 19, 1911.

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To all whom it may concern:

Be it known that I, ALEXANDER M. GRAY, a subject of the King of England, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Induction-Motors, of which the following is a full, clear, and exact specification.

My invention relates to squirrel-cage induction motors, and more particularly to means for short-circuiting the conductors of the rotor and for cooling the various members of the machine.

The object of my invention is to provide an inexpensive means for short-circuiting the rotor conductors of squirrel-cage induction motors and in connection therewith means for keeping cool these conductors and other members of the machine.

In carrying out my invention I have provided short-circuiting rings of good conducting material to which the rotor conductors are clamped, and in connection with these, clamping end-rings provided with fans for cooling.

In the accompanying drawing Figure 1 is a longitudinal sectional view of the rotor of an induction motor embodying my invention, showing a portion of the stator; and Fig. 2 is a longitudinal sectional view of a modification.

Upon a shaft 10 in the arrangement shown in Fig. 1 is mounted a core 11, which is preferably laminated and provided with slots carrying conductors 12 and with ventilating spaces. These conductors may be carried on the surface of the core but are preferably mounted in the slots 29 in the core. Mounted upon the same shaft and pressing against the ends of said core are combined end-heads and short-circuiting rings 13, which are made of some good conducting material.

The ends of the conductors 12 are lapped over the short-circuiting rings 13 and clamped tightly between the short-circuiting rings and end-rings 14 provided with integral fans 15. These end-rings are mounted upon and insulated from annular integral projections 16 of the short-circuiting rings, and are also insulated from the rotor conductors. Rods 17 provided with threads at both ends pass through the core, short-circuiting rings 13, and end-rings 14, and are insulated from the last. Nuts 18 engage the threaded portions of the rods 17. When the nuts 18 are screwed

up, the core, short-circuiting rings, and end-rings are forced tightly together, clamping the ends of the rotor conductors between the short-circuiting rings and the end-rings.

In the modification shown in Fig. 2, end-heads 19 are mounted upon the shaft 20 and press against either side of the core 21. The ends of conductors 22 are lapped over and insulated from the inclined surfaces of the end-heads 19. Short-circuiting rings 23 having inclined surfaces surround and fit over the ends of the rotor conductors. The ends of the conductors are clamped between the inclined surfaces of the end-heads and short-circuiting rings and insulated from the former. End rings 24 provided with integral fans 25 are mounted on annular integral projections 26 of the end-heads 19. Insulating rings 30 are located between the short-circuiting and end-rings. Rods 27 provided with threads on both ends pass through the core, end-heads, and end-rings. When the nuts 28 on said rods are screwed up, the core, end-heads, and end-rings are drawn tightly together, clamping the ends of the rotor conductors between the end-heads, and short-circuiting rings and making a firm contact between said rotor conductors and the latter.

The two rotor constructions shown are very simple, inexpensive, and effective, and are particularly adapted for motors of small capacities. However many modifications may be made without departing from the spirit and scope of my invention, and all such modifications I aim to cover in the following claims.

What I claim as new is:—

1. In the rotary member of a dynamo-electric machine, the combination of a shaft, a core mounted on said shaft, conductors carried by said core, short-circuiting rings in contact with said conductors, end-rings provided with fans and insulated from said conductors, and means for holding firmly together said core, short-circuiting rings, and end-rings and clamping said short-circuiting rings against said conductors.

2. In the rotary member of dynamo-electric machines, the combination of a support, a core mounted on said support, a short-circuiting ring, an annular member adjacent to and insulated from said short-circuiting ring, and conductors carried by said core and retained between said short-circuiting

ring and annular member, said short-circuiting ring and annular member being disposed laterally relatively to each other.

3. In the rotary member of a dynamo-electric machine, the combination of a shaft, a core mounted on said shaft, conductors carried by said core, short-circuiting rings in contact with said conductors, end-rings provided with integral fans, and means for drawing said core, short-circuiting rings, and end-rings tightly together and clamping the ends of said conductors.

4. In the rotary member of a dynamo-electric machine, the combination of a shaft, a core carrying conductors and mounted on said shaft, short-circuiting rings adapted to be pressed into and retained in engagement with said conductors, separate end-heads provided with axial annular integral projections, end-rings provided with fans and mounted on said projections of said end-heads, and means associated with said core and end-rings for pressing together said conductors and short-circuiting rings.

5. In the rotary member of a dynamo-electric machine, the combination of a shaft, a laminated core mounted thereon and provided with slots, conductors in said slots, short-circuiting rings electrically connected to said conductors, end-rings provided with integral fans, and a member passing through said core and end-rings to retain the connection between said conductors and short-circuiting rings.

6. In the rotor of a dynamo-electric machine, the combination of a shaft, a core mounted on said shaft, conductors carried by said core, end-heads having annular integral projections, short-circuiting rings surrounding and in electrical contact with the ends of said conductors, and end rings provided with fans and insulated from said short-circuiting rings, said end rings being mounted on said projections.

7. In the rotor of a dynamo-electric machine, the combination of a shaft, a core mounted on said shaft, end-heads mounted on said shaft against said core and having annular integral projections, conductors carried by said core and having their ends insulated from and lapped over said end-heads, short-circuiting rings surrounding and in electrical contact with the lapped over ends of said conductors, and end-rings provided with fans and mounted on said projections.

8. In the rotary member of a dynamo-electric machine, the combination of a shaft, a core mounted on said shaft, conductors carried by said core, end-heads having annular integral projections, said end-heads being mounted on said shaft and against either side of said core, the ends of said conductors insulated from and lapped over said end-heads, short-circuiting rings surrounding and

in electrical contact with ends of said conductors, end-rings provided with integral fans and mounted on said projections of said end-heads, and clamping means arranged to hold the parts firmly together and to force said conductors and said short-circuiting rings into good electrical contact.

9. In the rotor of a dynamo-electric machine, the combination of a shaft, a core mounted on said shaft, conductors carried by said core, end-heads mounted on said shaft against said core and having annular integral projections, short-circuiting rings in contact with said conductors, and end-rings provided with integral fans.

10. In the rotary member of a dynamo-electric machine, the combination of a shaft, a core mounted on said shaft, conductors carried by said core, end-heads mounted on said shaft and having inclined surfaces and annular integral projections, short-circuiting rings having inclined surfaces in electrical contact with the ends of said conductors, the ends of said conductors being between said inclined surfaces of said short-circuiting rings and said end-heads and insulated from the latter, and end-rings provided with fans and insulated from said short-circuiting rings, said end-rings being mounted on said projections.

11. In the rotary member of a dynamo-electric machine, the combination of a shaft, a core mounted thereon, conductors carried by said core, short-circuiting rings in electrical contact with said conductors, separate end-heads adjacent said core, clamping end-rings provided with fans and mounted on said end-heads, and a member passing through said core and end-rings for clamping said core, short-circuiting rings, and end-rings together, maintaining the electrical connection between said short-circuiting rings and conductors.

12. In the rotary member of a dynamo-electric machine, the combination of a shaft, a core carrying conductors and mounted on said shaft, end-heads retaining said core, end rings provided with fans and mounted on said end-heads, and short-circuiting rings in engagement with the ends of said conductors, and interposed between said end-heads and said end-rings.

13. In the rotary member of a dynamo-electric machine, the combination of a shaft, a core carrying conductors and mounted on said shaft, and three annular members located at each side of the core, one of said members provided with fans, another for short-circuiting the conductors, and the other for retaining the core.

14. In the rotary member of a dynamo-electric machine, the combination of a shaft, a core carrying conductors and mounted thereon, a plurality of annular members mounted at each end of said core, one of said

members provided with fans for cooling
purposes and another of said members short-
circuiting said conductors, said short-circuit-
ing member being interposed between said
5 fan-carrying member and said core, and
means for clamping together said core, con-
ductors, and annular members.

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

ALEXANDER M. GRAY.

Witnesses:

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

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
