F. R. KUNKEL.

DYNAMO ELECTRIC MACHINE.

APPLICATION FILED JULY 6, 1908.

1,115,440.

Patented Oct. 27, 1914.

3 SHEETS—SHEET 1.

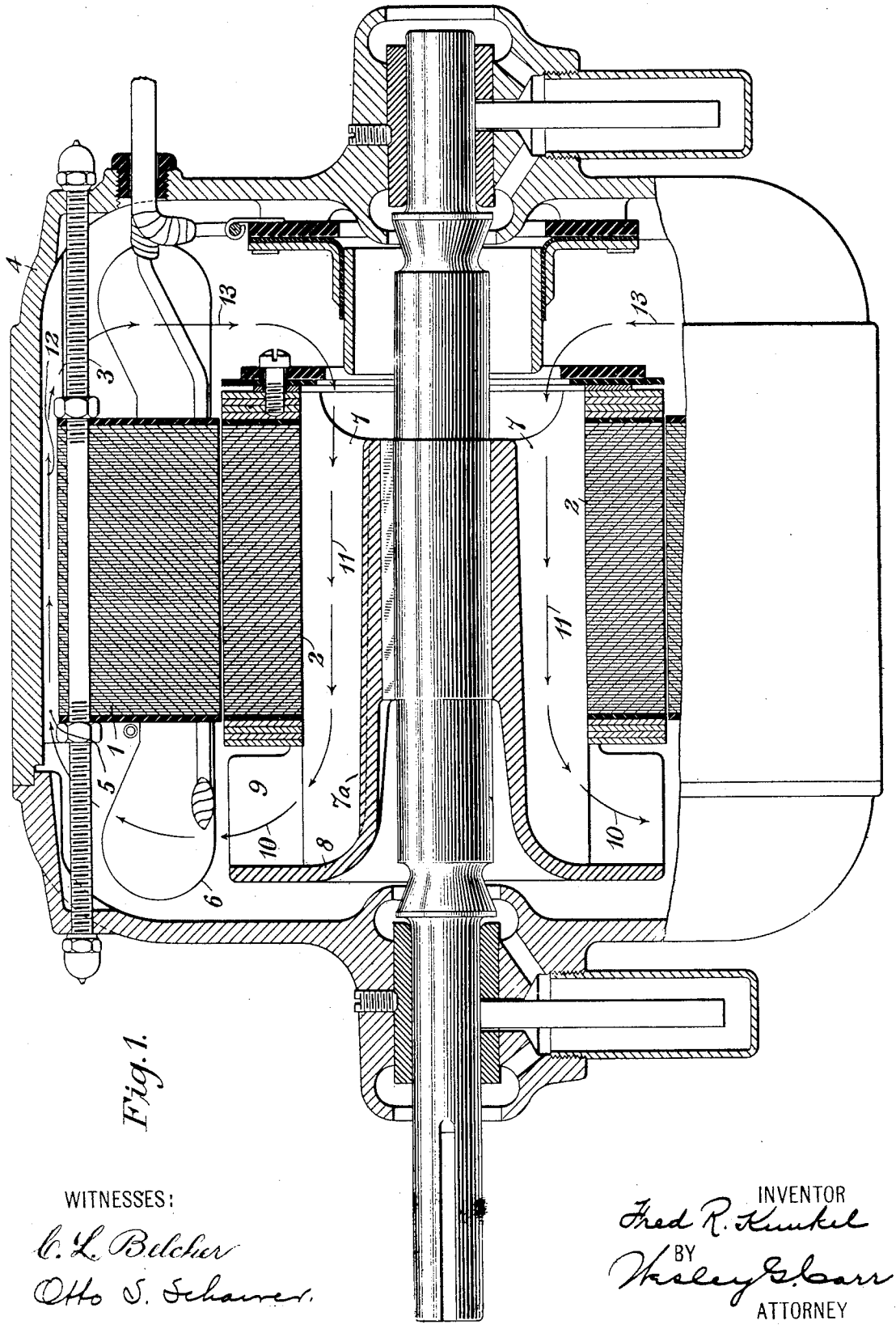


Fig. 1.

WITNESSES:

C. L. Belcher

Otto J. Schauer.

INVENTOR

Fred R. Kunkel

BY

Wesley G. Carr

ATTORNEY

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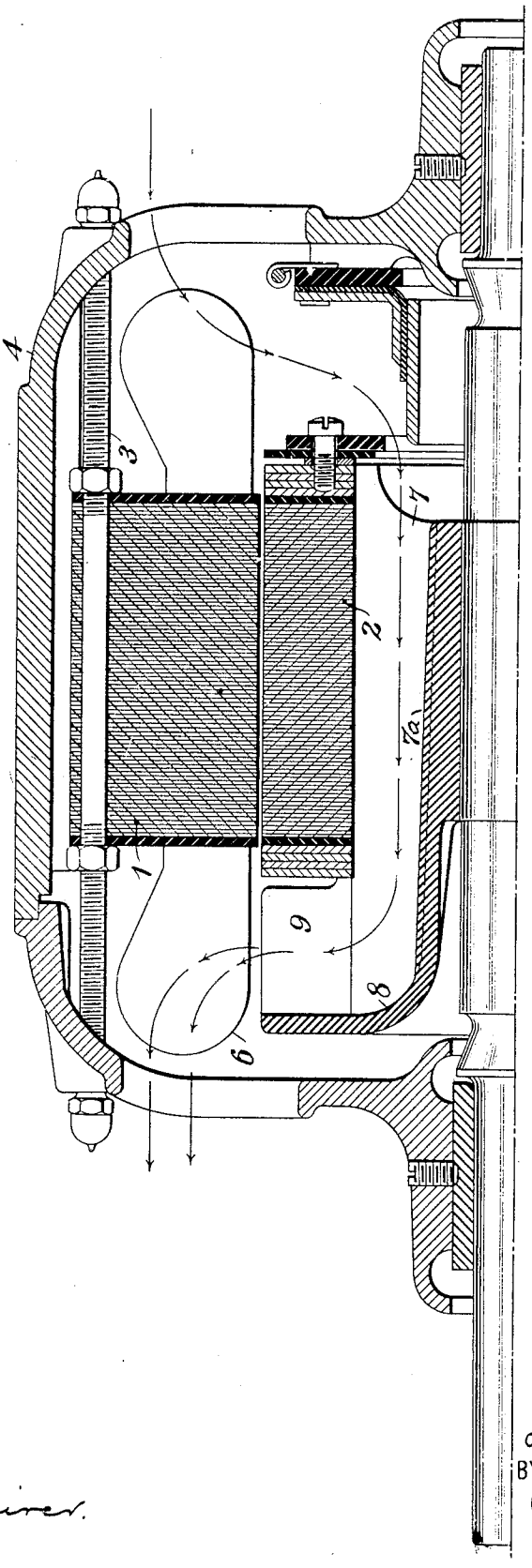


Fig. 2.

WITNESSES:

C. L. Belcher

Otto J. Schairer.

INVENTOR

Fred. R. Kunkel

BY Wesley G. Carr

ATTORNEY

F. R. KUNKEL.

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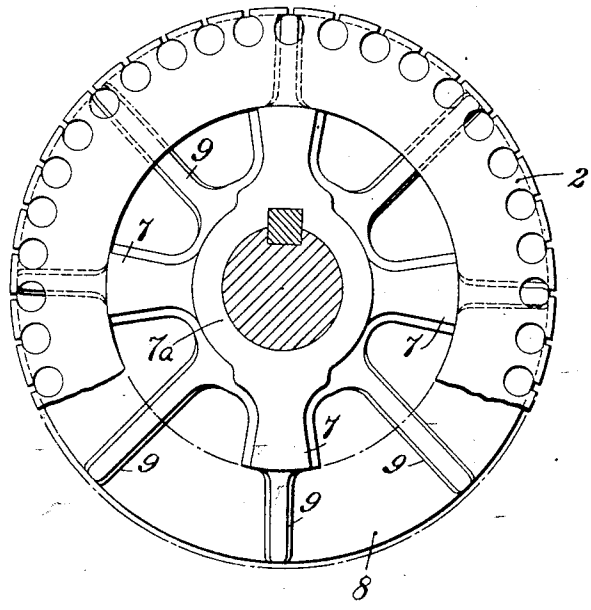
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3 SHEETS—SHEET 3.

Fig. 3.



WITNESSES:

C. L. Belcher

Otto S. Schauer.

INVENTOR

Fred R. Kunkel

BY

Wesley G. Carr

ATTORNEY

UNITED STATES PATENT OFFICE.

FRED R. KUNKEL, OF EDGEWOOD PARK, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, OF EAST PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DYNAMO-ELECTRIC MACHINE.

1,115,440. Specification of Letters Patent. Patented Oct. 27, 1914.

Application filed July 6, 1908. Serial No. 442,176.

To all whom it may concern:

Be it known that I, FRED R. KUNKEL, a citizen of the United States, and a resident of Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Dynamo-Electric Machines, of which the following is a specification.

My invention relates to dynamo-electric machines, and particularly to means for effecting ventilation and cooling thereof.

The object of my invention is to so construct and arrange the parts of a dynamo-electric machine as to cause and permit more effective cooling and ventilation than has been effected in connection with machines heretofore constructed.

Figure 1 of the accompanying drawings is a view in longitudinal section and in side elevation of a machine constructed in accordance with the present invention. Fig. 2 is a longitudinal sectional view through a portion of another machine also embodying the invention, and Fig. 3 is a view, in end elevation, of a rotatable member for the said machines.

The machine comprises, as is usual, stationary and rotatable laminated core members 1 and 2, the former of which is supported upon rods or bolts 3 and is mounted within an inclosing casing 4 for the machine, annular passages being provided between the outer circumferential face of the member and the casing. The stationary member is provided with a winding 6 that may be of any desired and suitable form.

The supporting spider for the rotatable core member 2 comprises a sleeve 7^a having radially projecting longitudinal ribs 7 upon which the core laminæ are mounted, an outwardly projecting annular flange 8 at a considerable distance beyond one end of the core and radial vanes 9 between the flange and the corresponding end of the core, all of said spider parts constituting a one-piece integral structure for supporting the core laminæ and providing ventilating passages to discharge currents of air against the projecting ends of the stationary coils 6, and also cool the core 2. The vanes 9 also act as fan blades to cause the circulation of air through the ventilating passages during the operation of the machine.

When the rotatable member of the machine is in motion, the vanes 9 cause a movement of air radially outward in the direction of the arrows 10, thus drawing air longitudinally through the passages provided in the rotatable member by the ribs 7, as indicated by the arrows 11, and causing drafts longitudinally through the passages 5 between the stationary core member and the casing in the opposite direction from those in the passages in the rotatable member, as indicated by the arrows 12, as well as between the ends of the passages in the stationary and rotatable members at the end of the machine opposite the vanes 9, as indicated by the arrows 13. Thus, it is seen that the circulation of air occurs through and from the innermost heated portions of the machine to the outermost portions, or adjacent to the casing, from which the heat conveyed by the air is radiated to the exterior of the machine, it being noted further that the drafts of air also pass between the ends of the coils 6.

While the invention is particularly adapted for employment in machines that are entirely inclosed, as shown in Fig. 1, it is also very effective in machines having open structures, in which the air may be drawn inwardly at one end through the winding at that end, then longitudinally through the rotatable member, and finally blown outwardly through the winding at the other end, as indicated by the arrows in Fig. 2.

I claim as my invention:

1. A rotatable member for dynamo-electric machines comprising a core and a one-piece supporting structure having, as integral parts thereof, a sleeve, radially projecting longitudinal ribs that constitute supports for the core laminæ and an outwardly projecting annular flange constituting a continuation of the body of the sleeve beyond the corresponding end of the core to deflect the air currents radially outward.

2. A rotatable member for dynamo-electric machines comprising a core and a one-piece supporting structure having, as integral parts thereof, a sleeve, longitudinal ribs, an outwardly projecting annular flange constituting a continuation of the body portion of the sleeve at one end and radial vanes disposed between the flange and the end of the core member.

3. A dynamo-electric machine comprising

stationary and rotatable members having laminated cores, an inclosing casing therefor, and a longitudinally ribbed sleeve support for the rotatable core member having an annular deflector at one end constituting a continuation of the body portion of the sleeve support, whereby currents of air are caused to flow through the rotatable member longitudinally from one end thereof in contact with its core and radially outward at the other end and between and in contact with the stationary core and the casing in the opposite direction.

4. In a dynamo - electric machine, the combination with a stationary member comprising a casing, a core and coils and having ventilating passages between the casing and the core, of a rotatable member having passages extending longitudinally therethrough and an annular deflector at one end of the passages and constituting a continuation of the inner walls thereof to deflect the air currents between the stationary coils.

5. In a dynamo - electric machine, the combination with a stationary member comprising a casing, a core and coils and having ventilating passages between the casing and the core, of a rotatable member having passages extending longitudinally therethrough and an annular deflector at one end of the passages and constituting a continuation of the inner walls thereof to deflect the air currents through the stationary coil spaces to the ventilating passages in the stationary member, and means for causing a circulation through and between the said passages.

6. In a dynamo - electric machine, the combination with a stationary member comprising a casing, a core and coils having ventilating passages between the casing and the core, of a rotatable member having passages extending longitudinally therethrough and an annular deflector at one end constituting a continuation of the inner walls of said passages to deflect the air currents through the stationary coil spaces to the passages in the stationary member, and vanes disposed radially between one end of the core of the rotatable member and the ends of the passages in the said member.

In testimony whereof, I have hereunto subscribed my name this 20th day of June, 1908.

FRED R. KUNKEL.

Witnesses:
W. J. Branson,
Birney Hines.