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Patented Dec. 9, 1902.

W. SPENCER, JR.  
VENTILATED MAGNET COIL.

Application filed May 23, 1902.

(No Model.)

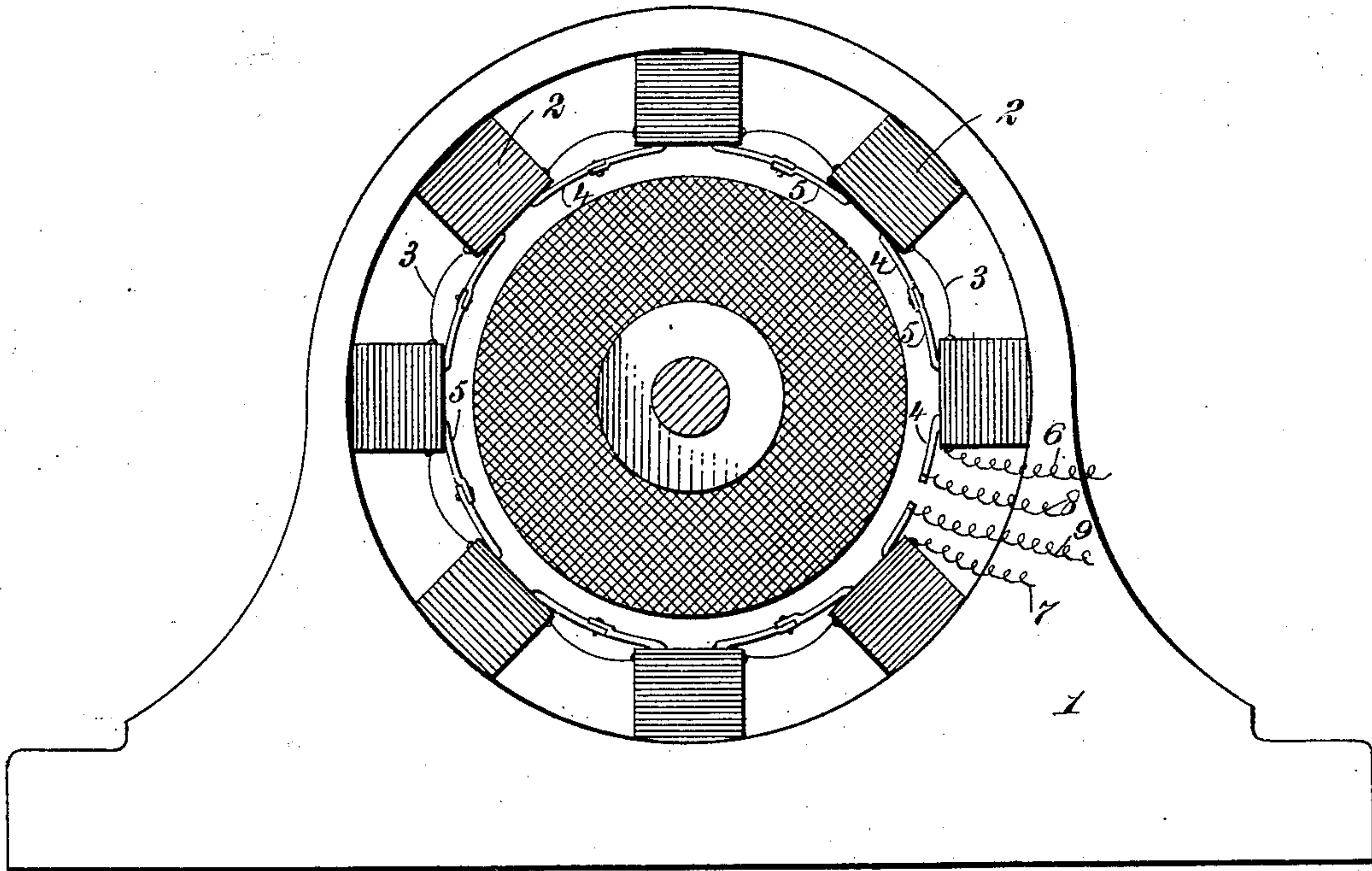


Fig. 1

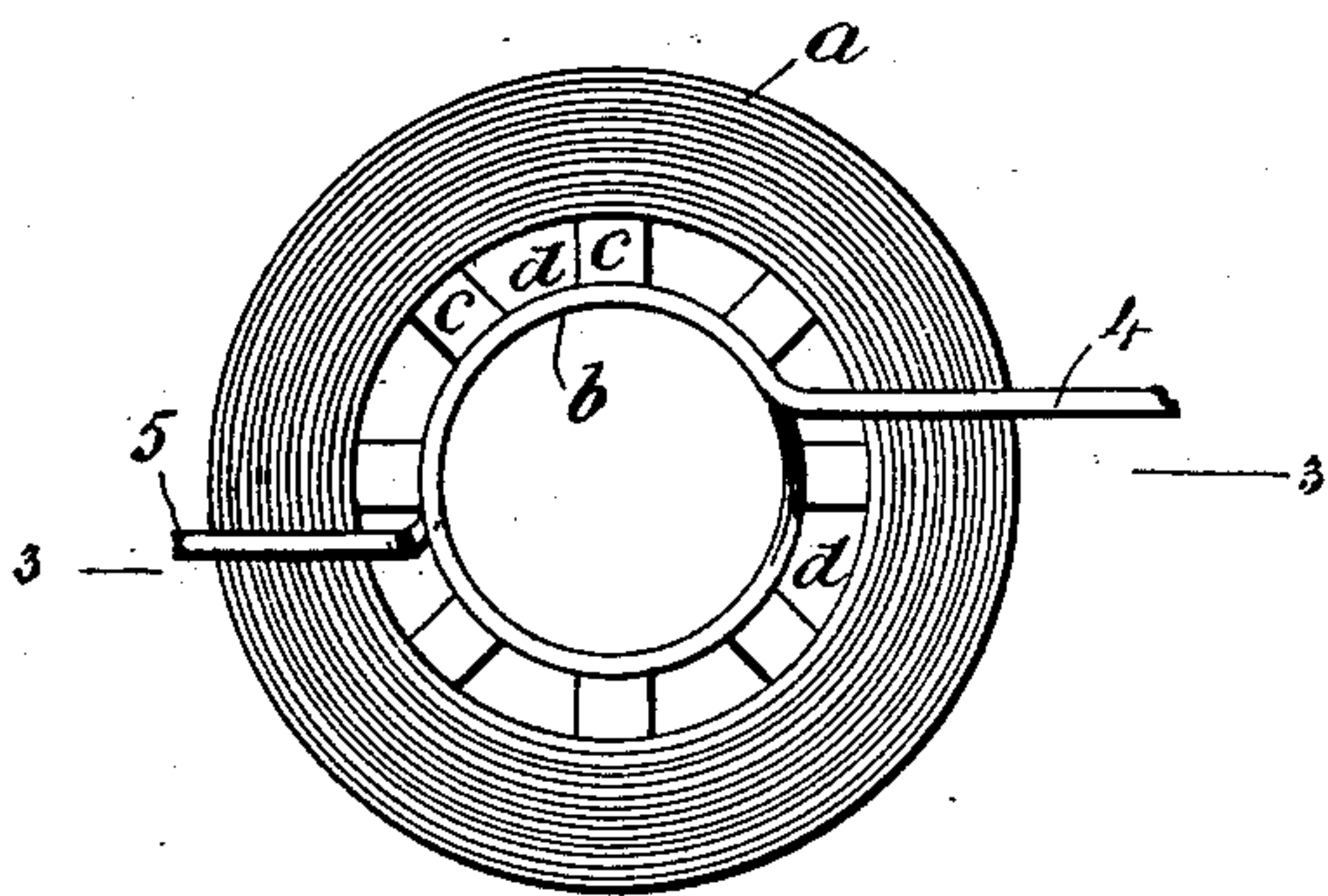


Fig. 2

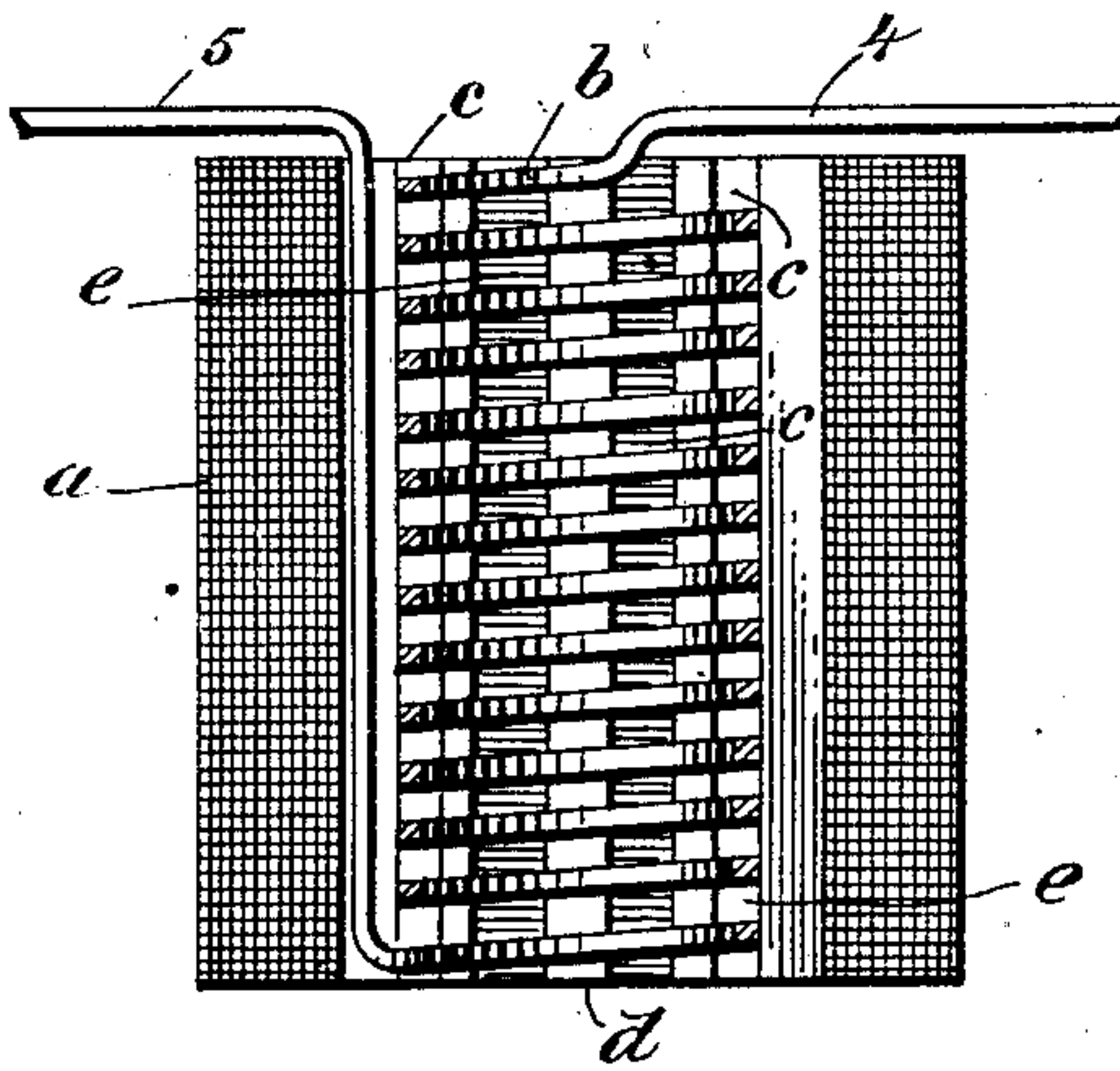


Fig. 3

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# UNITED STATES PATENT OFFICE.

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## VENTILATED MAGNET-COIL.

SPECIFICATION forming part of Letters Patent No. 715,618, dated December 9, 1902.

Application filed May 23, 1902. Serial No. 108,658. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM SPENCER, JR., a citizen of the United States, and a resident of Schenectady, in the county of Schenectady and State of New York, have invented new and useful Improvements in Ventilated Magnet-Coils, of which the following is a full, clear, and exact description.

My invention relates to improvements in magnet-coils used for electric devices—such as motors, generators, or the like—the object being to provide a coil having an inner helix thoroughly ventilated to prevent heating and the inner and outer helices separated by air-spaces for the same purpose.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation showing a number of my improved coils applied to a generator. Fig. 2 is a plan view, somewhat enlarged, of one of the coils; and Fig. 3 is a longitudinal section on the line 3 3 in Fig. 2.

The generator 1 is provided with a circle of coils 2, these coils being of composite structure, each consisting of an outer helix *a* of comparatively small wire and an inner helix *b* of larger wire, coiled as shown in Fig. 3. By means of the wires 3 the outer coils are connected serially together and are energized by means of the wires 6 7 from a shunt of the main current in the usual manner. The terminals 4 5 of the inner coil are connected in the manner indicated in Fig. 1 and are fed by the wires 8 9, which may or may not be in series with the main circuit, as desired. Between the outer and inner helices are a number of spacing-blocks *c c*, between which are air-spaces *d d* for the purpose of affording thorough ventilation. The wire of which the inner helix is composed is preferably of rectangular section and is coiled spirally around

in the general form of a cylinder of uniform diameter. This is for the purpose of creating air-spaces *e e* between adjacent convolutions of this helix. The object is to allow the greatest possible freedom of air circulation not only between the inner and outer helices, but likewise between adjacent convolutions of the inner helix. The inner helix is a little shorter than the outer helix—that is to say, the inner coil terminates somewhat inward of the ends of the outer helix. By this means the danger of grounding the inner helix by contacting with the ends of the outer helix or spool is avoided.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A composite coil comprising an outer helix, a plurality of spacing-blocks disposed therein, and an inner helix consisting of a single conductor wound spirally in the form of a cylinder, adjacent convolutions of said inner coil being separated by air-spaces, the arrangement being such that air can pass freely through the said air-spaces of the inner helix and through air-spaces existing between said spacing-blocks.

2. A composite coil comprising an outer helix and an inner helix separated by spacing-blocks, said inner helix consisting of a single wire coiled spirally in the form of a cylinder, the curvature of said wire being uniform throughout said cylinder and adjacent convolutions of said wire being spaced asunder to afford ventilation.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. SPENCER, JR.

Witnesses:

ALEX. FENWICK,  
A. T. G. WEMPLE.