(No Model.)

J. BRAM.

ELECTRIC MOTOR.

No. 566,889. Patented Sept. 1, 1896.

Fig. 1.

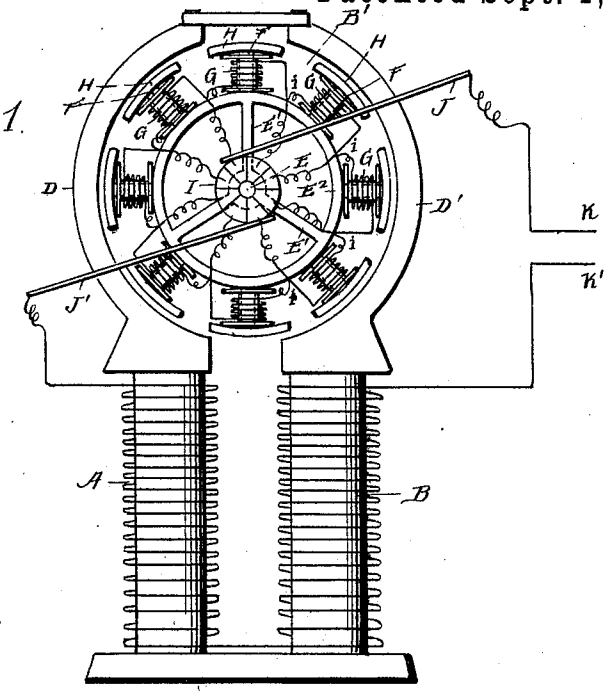


Fig. 2.

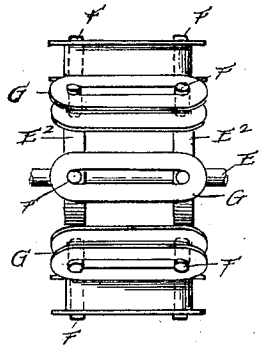
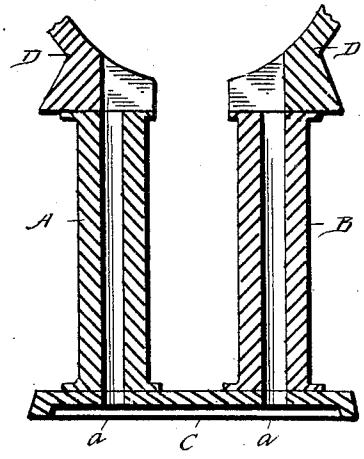


Fig. 3.



WITNESSES

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JACOB BRAM, OF DECATUR, ILLINOIS.

ELECTRIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 566,889, dated September 1, 1896.

Application filed September 5, 1895. Serial No. 561,579. (No model.)

To all whom it may concern:

Be it known that I, JACOB BRAM, a citizen of the United States, and a resident of Decatur, in the county of Macon and State of Illinois, have invented certain new and useful Improvements in Electric Motors; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a front view of invention, partly diagrammatic. Fig. 2 is a side view of armature, magnetic pole-plates and wire from bobbins being removed. Fig. 3 is a sectional view showing air-passages through vertical core-posts.

This invention is designed to provide an electric motor capable of operation with either a continuous or an alternating current, which is ventilated to permit a thorough circulation of air through and around its armature, and which is easily wound.

With these objects in view the invention consists in the novel construction and combination of parts, all as hereinafter described, and pointed out in the appended claims.

Referring to the accompanying drawings, the letters A and B designate the two field-magnets, which have the vertical core-posts supported upon a base C. Said posts are bored vertically, as seen at *a*, to provide air-passages which open into the base, which is hollow on its under side, as indicated.

D D′ are the semicylindrical pole-pieces which embrace the armature B. Said armature consists of a central shaft E, having near each end a spider E′ rigidly secured thereto, the arms of said spiders carrying each an annular rim or ring E^2. Carried by each of said rims or rings are a series of short radial posts F, which correspond in number to the number of the armature-coils. Said coils consist each of a bobbin G, which is wound and then slipped over the posts F, each of said bobbins extending longitudinally of the armature from a post of one of the rims or rings to an opposite post of the other rim or ring.

H designates magnetic pole-plates which are secured to the outer ends of the said posts after the bobbins are in place, and which extend longitudinally of the armature, or parallel with the coils, from one end to the other. Said plates are of convex-concave form, being conformed to the radius of the armature, and rotate in close relation to the pole-pieces of the fields. The longitudinal edges of these plates, as well as the coil-bobbins, are separated from each other by a space or interval.

I is the commutator on the armature-shaft, its several sections being connected with the loops *i*, which connect adjacent coils. Adjacent coils are wound oppositely to each other, as indicated.

J J′ are the respective brushes.

K K′ are the supply-wires. The wire K is connected directly to the brush J, while wire K′ is connected to brush J′ through the coils of the field-magnets.

As the armature rotates a circulation of air is induced through the hollow cores of the fields, while the open character of the armature permits a thorough circulation through or around all parts thereof.

The mass of the armature being comparatively small, but little residual magnetic effect is produced, while its construction is such that eddy currents are avoided. This, together with the thorough ventilation of the parts, renders the motor operative with alternating as well as with continuous currents.

The bobbins G are provided with retaining-flanges, and are longitudinally slotted, whereby they may be readily slipped over the radial posts of the armature.

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

1. In an electric motor, the combination with the field-magnet cores having the pole-pieces D, D, and the air-passages which extend through said cores and pole-pieces, of the open armature comprising a central shaft, an open-arm spider E′ rigidly secured upon each end portion of the said shaft and having a continuous ring or rim E^2 of a diameter considerably larger than that of the shaft, a series of radial core-posts carried by the said rims or rings, the slotted and flanged, longitudinal bobbins wound with coils and seated

upon the said posts, and the convexo-concave magnetic plates H which connect opposite pairs of the said posts.

2. In an electric motor, the combination with an armature having radial posts or projections near each end, of flanged and slotted bobbins wound with coils and adapted to be removably seated longitudinally of the armature on the said posts or projections, substantially as specified.

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

JACOB BRAM.

Witnesses:

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