

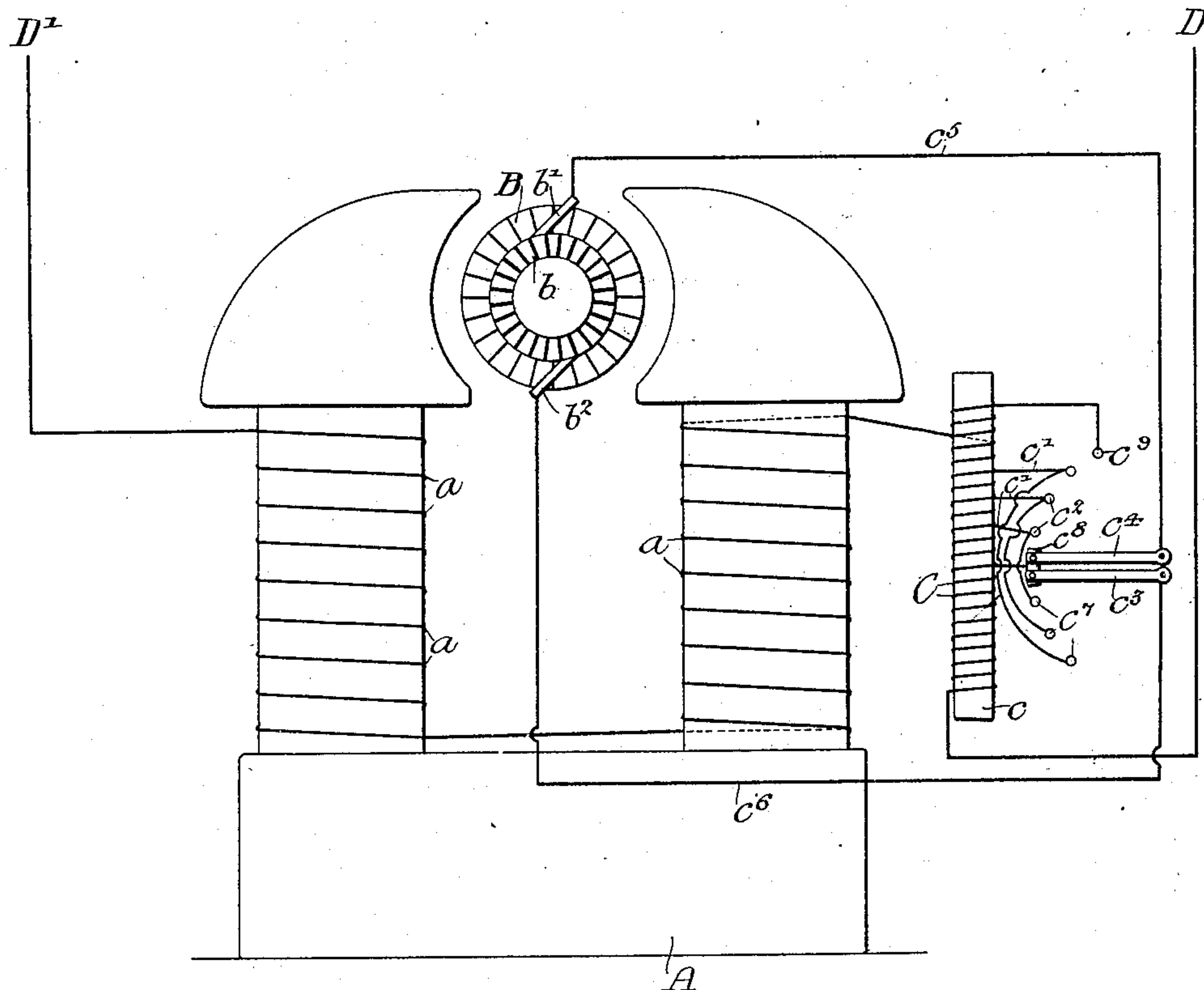
No. 725,596.

PATENTED APR. 14, 1903.

A. W. SCHRAMM.  
ALTERNATING CURRENT MOTOR.

APPLICATION FILED JAN. 9, 1903.

NO MODEL.



Witnesses:-

*Augustus B. Cooper*  
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# UNITED STATES PATENT OFFICE.

ADOLPH W. SCHRAMM, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
ELECTRO DENTAL MANUFACTURING COMPANY, OF PHILADELPHIA,  
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## ALTERNATING-CURRENT MOTOR.

SPECIFICATION forming part of Letters Patent No. 725,596, dated April 14, 1903.

Application filed January 9, 1903. Serial No. 138,398. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLPH W. SCHRAMM, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Alternating-Current Motors, of which the following is a specification.

My invention consists in certain improvements in that class of motors designed to be operated by an alternating current of electricity, my object being to provide a motor especially adapted for use on circuits supplied with single-phase alternating current, which while being of a simple construction shall be easily and efficiently controlled as to variations of speed and the direction of rotation of its moving element. This object I attain as hereinafter set forth, reference being had to the accompanying drawing, in which the figure is a diagrammatic view of a motor constructed according to my invention, showing the various circuits and the connections thereof to current-supply mains.

In the drawing, A represents the frame of the motor, which is of a construction such that it will enable said motor to operate efficiently when supplied with an alternating current, there being in the present instance two field-magnets having windings  $a$  and an armature B, provided with a commutator  $b$ . Suitably supported either upon the motor-frame or externally thereto is a coil of wire C, wound upon a core  $c$ , of magnetic material, having one end connected to one of the supply-mains D and connected at some point of its length to one end of the field-magnet winding  $a$ , the second end of said field-magnet winding  $a$  being connected to the second supply-main D'.

I connect to certain of the convolutions of the coil C a series of taps  $c'$ , providing them with contact-terminals  $c^2$ , preferably placed in the arc of a circle, at the center of which are pivoted two electrically-independent contact-arms  $c^3$  and  $c^4$ , one of these being connected by a wire  $c^5$  to one of the armature or brush terminals  $b'$  and the other by a wire  $c^6$  to the second armature-terminal  $b^2$ . In addition to the contact-pieces  $c^2$ , directly con-

nected to convolutions of the coil C, I provide a second set of contact-terminals  $c^7$ , each of which is connected to one of the contact-buttons  $c^2$ , as shown in the figure, the central piece  $c^8$  of the series being somewhat larger than the others, so as to simultaneously accommodate both of the arms  $c^3$  and  $c^4$ .

As shown in the device illustrated, I may provide any desired number of turns of wire connected to or forming part of the coil C and extending beyond the point at which the field-magnet winding is connected to said coil. From this extra wire I extend any number of taps to corresponding contact-pieces, as  $c^9$ , by this means making possible the application to the armature of a higher electromotive force than would otherwise be possible.

In operation if the supply-circuit be closed through the motor and both of the arms  $c^3$  and  $c^4$  are resting upon the central contact-piece  $c^8$  there will be no revolution of the armature as long as the brushes thereof are in the position shown in the figure. If, however, one of the contact-arms, as  $c^4$ , be moved over the contact-pieces  $c^2$ , the armature will begin to rotate and at a speed depending upon the distance said arm is moved from its central position. By again bringing this arm  $c^4$  to said central position and moving the arm  $c^3$  over the contact-points  $c^7$  the armature will be started and will be rotated in a direction opposite to that above noted.

I claim as my invention—

1. The combination with an electric motor having field-windings, an armature with a commutator and brushes, of an inductance-coil having a constant number of its convolutions connected with the field-windings and means for connecting the brushes at will to different ones of the convolutions of said coil, substantially as described.

2. The combination with an electric motor having field-windings, an armature with a commutator and brushes, of an inductance-coil permanently in series with said field-windings and means for connecting the brushes to different points of the said coil, substantially as described.

3. The combination of an alternating-cur-



rent motor having field-windings, an armature with a commutator and brushes, with an inductance-coil having a series of contact-pieces connected to certain of its convolutions and a contact-arm connected to one of the armature-terminals and placed to engage said contact-pieces, with means for connecting the other armature-terminal to different points of said coil at will, substantially as described.

4. The combination of an alternating-current motor, a coil connected to the field thereof, a series of contact-pieces electrically connected to different points of said coil, with a plurality of contact-arms placed to engage said contact-pieces, and a connection between each of said arms and the respective armature-terminals, substantially as described.

5. The combination with an alternating-current motor having field-windings, an armature with a commutator and brushes, of a coil having a series of contact-pieces connected to certain of its convolutions, a second series of contact-pieces connected to the first set and two contact-arms connected respectively to the terminals of the armature and so placed that one of the same is free to engage the first set of contact-pieces and the other is free to engage the second set of the same, substantially as described.

6. In an alternating-current motor, the combination of field-windings and an armature having a commutator and brushes with an inductance-coil, a variable portion of said coil and the armature being in shunt to each other and the field-coils being in series with the combined armature and inductance-coil, substantially as described.

7. The combination with an alternating-current motor having field-windings, an armature with a commutator and brushes, of a coil having a constant number of its convolutions connected to said field-winding and provided with a series of contact-pieces directly connected to certain of said convolutions, a second series of contact-pieces connected respectively to those of the first series,

means for connecting one brush-terminal to the coil and means for connecting the second brush-terminal at will to different ones of the contact-pieces, substantially as described.

8. The combination with an alternating-current motor having field-windings, an armature with a commutator and brushes, of a coil having a constant number of its convolutions connected to said field-winding and provided with a series of contact-pieces connected to different points of said coil, the connection of the said field-windings to the coil being made between the points of connection of certain of the contact-pieces, and means engaging said contact-pieces for placing more or less of the coil in circuit with the armature, substantially as described.

9. The combination with an alternating-current motor having field-windings, an armature with a commutator and brushes, of a coil provided with a series of connections to its convolutions, a series of contact-pieces for said connections, said coil being connected to the field and having a portion extending beyond the point of connection of the field provided with connections and contact-pieces, with a contact-arm connected to an armature-terminal for engaging said contact-pieces, substantially as described.

10. The combination with an alternating-current motor having field-windings, an armature with a commutator and brushes, of a coil connected to the field-windings, a number of contact-pieces, means for connecting certain of said contacts to different points of the coil, means for connecting said latter contacts with others, with a pair of contact-arms connected to the armature and placed to engage said contact-pieces, substantially as described.

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

ADOLPH W. SCHRAMM.

Witnesses:

R. RAUDENBUSH,  
JOS. H. KLEIN.