

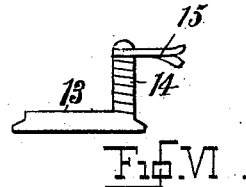
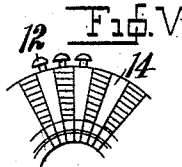
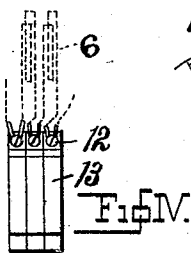
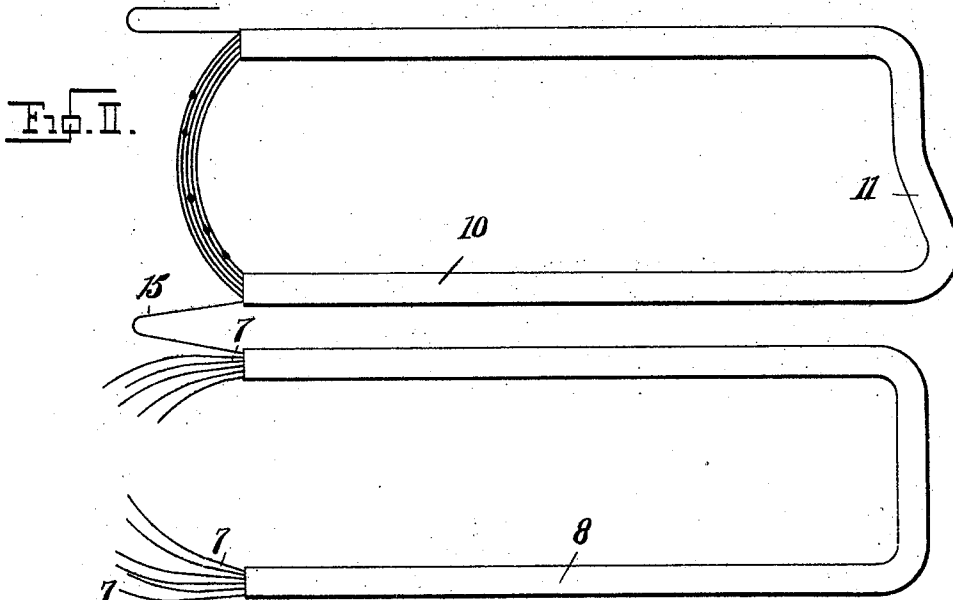
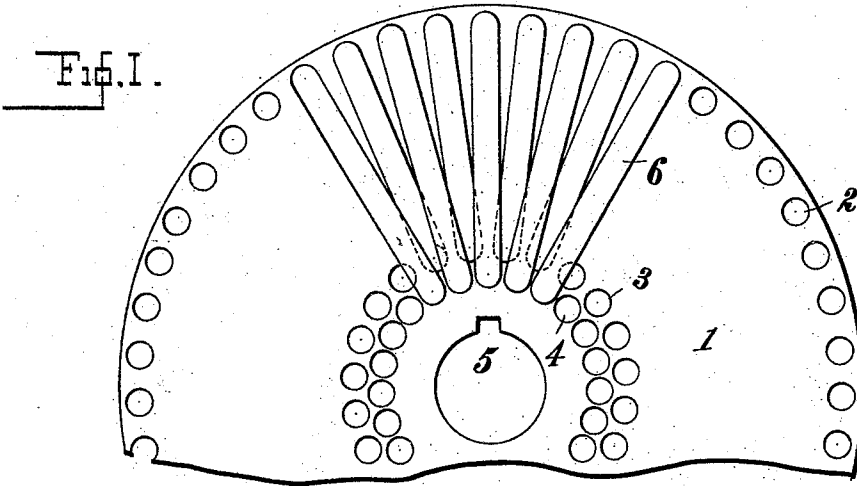
(No Model.)

J. C. HENRY.

COMMUTATOR FOR MAGNETO ELECTRIC MACHINES.

No. 554,063.

Patented Feb. 4, 1896.



Witnesses
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Inventor
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By *[Signature]*
Att'y.

UNITED STATES PATENT OFFICE.

JOHN C. HENRY, OF WESTFIELD, NEW JERSEY.

COMMUTATOR FOR MAGNETO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 554,063, dated February 4, 1896.

Original application filed December 16, 1891, Serial No. 415,288. Divided and this application filed March 31, 1893. Serial No. 468,541. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. HENRY, a citizen of the United States, residing at Westfield, county of Union, State of New Jersey, have invented certain new and useful Improvements in Commutators for Magneto-Electric Machines, of which the following is a specification.

My present invention has been divided out of my application, Serial No. 415,288, filed December 16, 1891, and relates to the means employed whereby the commutator is made readily removable and complete insulation of adjacent segments is arrived at in a much simpler manner than that customarily employed.

Referring to the accompanying drawings, which form a part of this specification, Figure I is an end view of a part of an armature, showing the same partially wound in my improved manner. Fig. II is a detail view showing two adjacent loops of the armature-coil in process of winding. Fig. III is a sectional view through one loop of the armature-winding to an enlarged scale. Fig. IV is a top view of three segments of the commutator, showing diagrammatically in dotted lines the connection of the same to the armature-coil. Fig. V is a partial end view of the commutator. Fig. VI is a side view of one of the commutator-segments.

Fig. I represents the end of the armature remote from the commutator. The armature-core may be made up of a series of laminations or plates 1, which have a series of holes 2 at or near their circumference extending the length of the armature and similar series of holes 3 4, extending the length of the armature adjacent to the shaft-aperture 5. With this construction no spider is used, the laminations being directly keyed to the shaft and secured endwise in the ordinary way by washers and nuts, such as commonly used with the drum form of armature. The holes 2 3 4 are intended to receive the armature-winding, and it is customary to make each loop 6 of the coil of a number of convolutions or separate wires 7. In this case I have shown six convolutions to each loop or section of the armature coil or winding. All the convolutions 7 of each loop or section 6 are connected

together in series by some usual means of joining wires, preferably electric welding.

In building up the armature I prefer to proceed as follows: Cables such as shown in Fig. III, of insulated wires 7, are cut to suitable lengths and bent to U form, as shown at 8 in Fig. II. They are then slipped into the openings in the armature-core, so as to assume the position shown in Fig. I. Wide and narrow loops are used alternately, the inner limbs of the wide loops occupying the inner row of holes 4 and the inner limbs of the narrow loops occupying the row of holes 3. The wider loops are bent, as shown at 11 in Fig. II, in shape to lie over but close to the two adjacent narrow loops, locking them all securely together, as may be seen by an inspection of Fig. I. When a loop 8 is, as above stated, placed in position its wires 7 project sufficiently beyond the insulating-envelope 9 to afford secure means of connection to the proper wires of the adjacent loops, and these projecting ends are, after the loops are inserted into the core as above described, coupled together in series by having their ends brought together and then welded or soldered, so as to make a complete loop, as shown at 10 in Fig. II. The free end of each loop is then connected to the adjacent free end of the next loop, as shown at 15, a sufficient length being allowed at this connection to wind the wire around the binding screw or stud 12 of the appropriate commutator-segment 13, and the several loops of the armature-wiring are thus properly connected together by a practically continuous wire. The looping or wiring of the end wires of the adjacent sections directly around the commutator screws or studs instead of fastening the same by soldering, as usual, effects great saving of time both in building the commutator and in the removing of the commutator when it is necessary to take it apart for cleaning or repairs.

The commutator is preferably made with the usual end insulation and with the segments 13, embracing the armature-shaft and having radial arms 14 bearing the connection screws or studs 12. To save time and render the operation of insulation between adjacent segments more simple and at the same time

without lessening its efficiency, I prefer to insulate only every alternate segment, as shown in Fig. V, leaving the remaining commutator-segments bare. The insulation is
5 applied prior to the putting of the commutator together preferably by winding the individual bars which form the alternate segments of the commutator with a continuous tape of insulating material.

10 In making the connection of the armature-winding to the commutator-segments it is preferred to first form the loops 15, which are the terminals of each section or loop of the commutator, into proper shape on a former,
15 so that when the commutator is placed on the shaft the several loops 15 will be in position to be readily clamped by the screws 12 onto the appropriate commutator-segments. With

this arrangement any section of the armature can be readily detached and cut out of the
20 circuit on removing the screws which connect its end loops to the commutator.

Having thus described my invention, the following is what I claim as new therein and
25 desire to secure by Letters Patent:

1. A commutator for a magneto-electric
machine having the radial arms of its alternate segments surrounded with insulation.

2. A commutator having insulation applied
30 to the alternate segments only, substantially as set forth.

JOHN C. HENRY.

Witnesses:

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