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J. M. VOGEL

COMMUTATOR CONNECTION

Filed Aug. 2, 1924

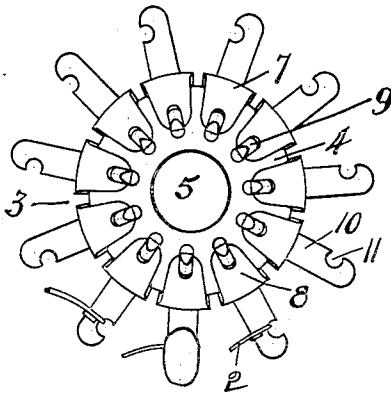


Fig. 1

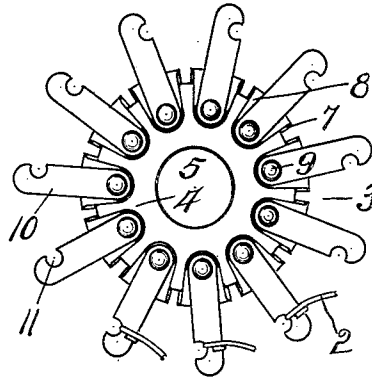


Fig. 2

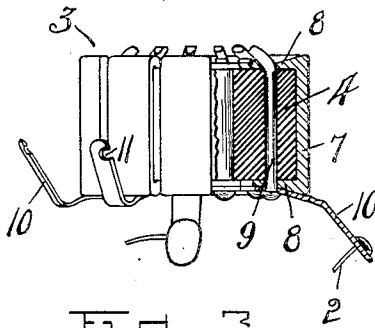


Fig. 3

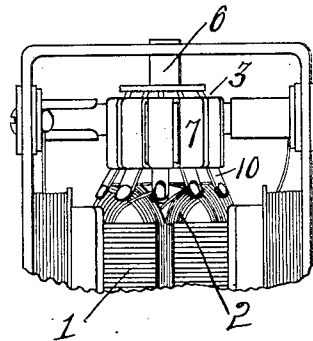


Fig. 4

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UNITED STATES PATENT OFFICE.

JOSEPH M. VOGEL, OF ADRIAN, MICHIGAN, ASSIGNOR TO UNITED ELECTRICAL MANUFACTURING COMPANY, OF ADRIAN, MICHIGAN, A CORPORATION OF MICHIGAN.

COMMUTATOR CONNECTION.

Application filed August 2, 1924. Serial No. 729,853.

To all whom it may concern:

Be it known that I, JOSEPH M. VOGEL, a citizen of the United States, and a resident of Adrian, in the county of Lenawee and State of Michigan, have invented a new and useful Commutator Connection, which invention is fully set forth in the following specification.

This invention relates to commutators for use in connection with electric motors and generators, and particularly to the manner of connecting the segment thereof to the respective armature winding.

It is a slow and tedious matter, with the present practices, to connect the different armature windings to the respective bars of an associated commutator and to solder the joints thus formed, and the purpose of the present invention is to provide a simple and efficient method and means for accomplishing this in a rapid and easy manner and without the necessity of employing skilled labor therefor, and which will at the same time permit the joints or points of connection to be quickly soldered by dipping instead of soldering each union separately.

The invention is fully described in the following specification, and while in its broader aspect it is capable of embodiment in numerous forms, one embodiment thereof is illustrated in the accompanying drawings, in which,

Figure 1 is an outer end view of a commutator embodying the invention, with windings shown as connected to a few of the connecting members and with one connection soldered. Figure 2 is an opposite end view thereof. Fig. 3 is a side elevation of the commutator with a part broken away and with some of the winding connecting fingers thereof in initial connecting position and others bent into final usable position, and Fig. 4 is a fragmentary side elevation of an electric motor with the connections between the windings and commutator segments embodying the invention and in usable position.

Referring to the drawings, 1 designates the armature of an electric motor or generator, 2 the different windings thereof and 3 the commutator, the connections between the segments of which and the armature windings embody the invention.

The commutator 3 in its present preferred embodiment comprises a circular core 4 of

bakelite or other suitable insulating material, which is provided with a central opening 5 for fitting the armature shaft 6. The segment bars 7 of the commutator are disposed in parallel equidistantly spaced relation around the periphery of the core, and each is provided at its ends with inwardly projecting ears 8, which render the bars of U-form and adapt them to be seated in straddling relation on the core with the ears 8 closely embracing the core ends to hold the bars in position thereon. The bars are further securely held in position on the core by pins 9 which are projected through holes bored or formed through the ears and core in parallel relation to the core axis, the pins being headed at one end and having their opposite ends upset to prevent withdrawal, a pin being provided for each segment.

The pins 9 also serve the purpose of securing the armature winding connecting fingers 10 to the inner ends of the different segments 7, said fingers being apertured at one end to receive the pins and be disposed, in the present instance, between the headed ends of the pins and the adjacent ears 8 of the segment bars.

The fingers 10 are of bendable nature and of a material which will serve as a good electrical conductor, and will also permit soldering of the armature winding ends thereto, such, for instance, as brass. The fingers 10 are of sufficient length to project a short distance beyond the commutator periphery and to adapt them to be bent around and over the commutator periphery in spaced relation thereto and toward its opposite ends to facilitate soldering, as hereinafter described. Each finger is provided near its outer end with an opening or side notch 11 to facilitate engagement of an end of an armature winding 2 with the finger, the wire being preferably wrapped one or more times around the finger and through the notch or opening 11.

When all of the windings of an armature have been secured to the different fingers of the associated commutator, the fingers are initially disposed in outwardly bent relation over the adjacent end portions of the commutators, as shown by the fingers in the left-hand portion of Fig. 3, thereby permitting the end of the commutator opposite to the armature to be dipped into a soldering solution a sufficient depth to submerge the

downwardly projecting ends of the fingers 10 therein, so that the point of connection of the windings with the fingers will be securely soldered. This having been done, 5 the commutator is cleaned of any solder which may have adhered thereto and which might cause short circuiting, and the fingers 10 are then bent away from the commutator and over or adjacent to the associated end 10 of the armature, as shown in Fig. 4.

It is found in practice that this makes a very efficient, easy and rapid method of connecting the armature winding to the commutator segments as it obviates the necessity of skilled labor for the purpose and 15 enables all of the winding connections with the commutator to be soldered at one time instead of being separately soldered, as is now customarily done.

I wish it understood that my invention is not limited to any specific construction, arrangement, or form of the parts, or to the different steps and order of the method employed, as it is capable of numerous modifications and changes without departing from 25 the spirit of the claims.

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

30 1. A commutator having a core of insulating material, U-shaped segmental bars straddling the periphery of the core in equidistantly spaced relation around the core, the segment legs and core having 35 aligned apertures, retaining pins disposed within said apertures, and armature winding connecting fingers secured at one end to each segment by the retaining pin for such segment.

40 2. A commutator having an insulating core, a plurality of segment bars disposed in peripherally spaced parallel relation

around the periphery of the core and each having ears projecting inward from its ends, retaining pins for the segments extending 45 through the ears thereof and the core, and an armature winding connecting finger projecting from each segment bar at one end of the commutator and connected thereto by the retaining pin for such bar. 50

3. The method of electrically uniting the windings of an armature to the associated commutator bars, which bars have bendable fingers projecting from the armature end 55 thereof, consisting in engaging the respective winding terminals with the fingers then dipping the opposite or outer end of the commutator in a soldering solution with the terminal connecting ends of the fingers 60 disposed in position to be submerged in the solder before the dipping has continued to a depth for the solder to engage the armature and after removing the commutator from the solution bending the fingers away 65 from the commutator to usable position.

4. The method of connecting armature windings to the respective commutator segments, consisting in providing the end of each segment adjacent to the armature with a bendable conductor finger, engaging the 70 respective armature winding terminals with the fingers, dipping the opposite end of the commutator in a soldering solution, the terminal engaging ends of the fingers, before 75 said dipping, being disposed in position for the solder to submerge the same before the commutator has been completely submerged, and after removal of the commutator from the soldering bath bending the free ends of 80 the fingers away from the adjacent commutator end in usable position.

In testimony whereof I have hereunto signed my name to this specification.

JOSEPH M. VOGEL.