F. P. HUYCK.

PROCESS OF MAKING AND MOUNTING COMMUTATORS.

APPLICATION FILED DEC. 4, 1909.

1,045,147.

Patented Nov. 26, 1912.

2 SHEETS—SHEET 1.

Fig. 1.

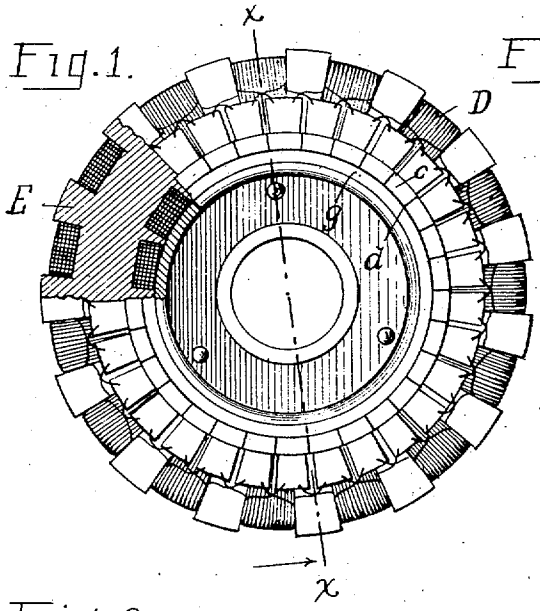

Fig. 2.

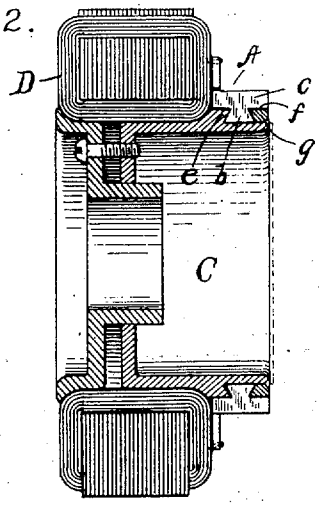

Fig. 3.

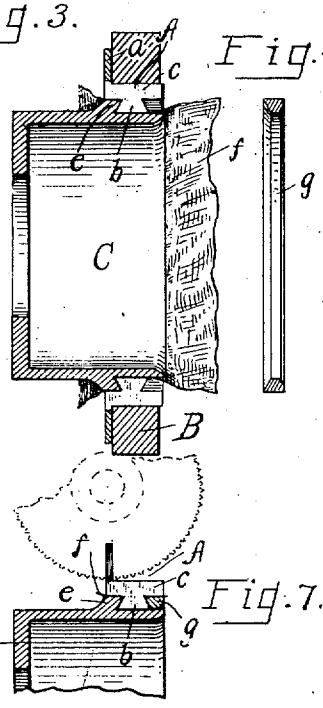

Fig. 4.

Fig. 5.

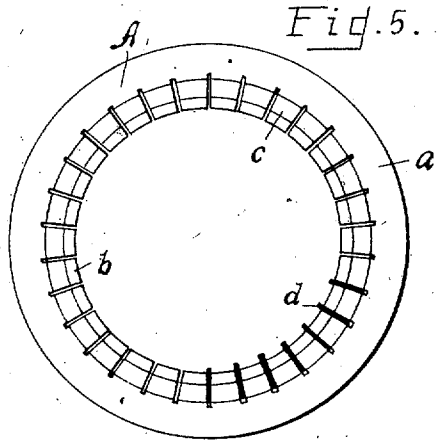

Fig. 6.

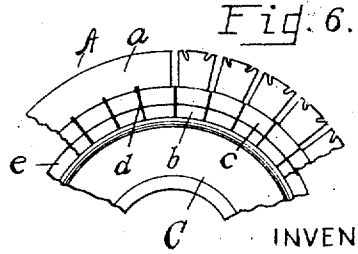

Fig. 7.

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2 SHEETS—SHEET 2.

Fig. 8.

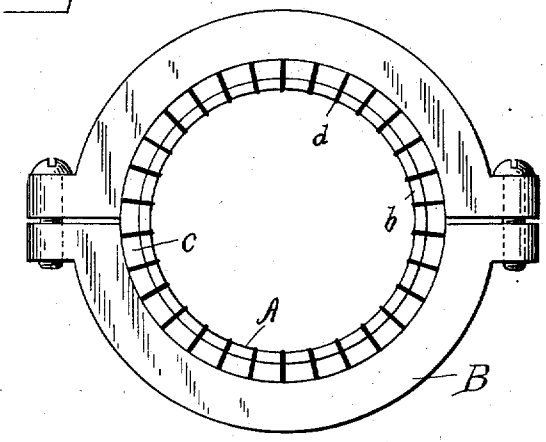
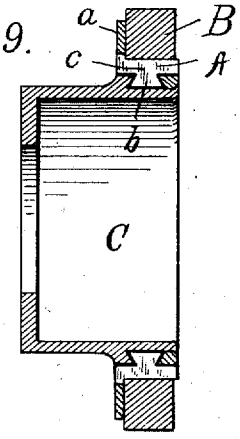


Fig. 9.



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PROCESS OF MAKING AND MOUNTING COMMUTATORS.

1,045,147. Specification of Letters Patent. Patented Nov. 26, 1912.

Application filed December 4, 1909. Serial No. 531,309.

To all whom it may concern:

Be it known that I, FRANCIS P. HUYCK, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Process of Making and Mounting Commutators; and I do hereby 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 the figures of reference marked thereon, which form a part of this specification.

My invention relates to electric motor construction and has particular reference to a method of making and mounting commutators on the rotors of such motors.

The object of my invention is to improve upon the process or processes heretofore employed in the manufacture of commutators, whereby to minimize the cost and very materially simplify and increase the rapidity of such manufacture.

While my invention in its broader aspect is capable of being performed in numerous ways without departing from the spirit thereof, a preferred method of practising the same is fully described in the following specification, and the various steps of the same illustrated in the accompanying drawings, in which,—

Figure 1 is an elevation of the commutator side of the rotor of a motor with a portion of the armature broken away. Fig. 2 is a transverse section on the line *x x* in Fig. 1. Fig. 3 is a similar section of a portion of the rotor hub or spider with the commutator ring partially separated into sections and set on such hub or spider but not locked. Fig. 4 is a similar section of the locking ring for the commutator. Fig. 5 is a side elevation of the commutator ring partly sawed into sections, and the spaces thus formed partly filled with insulation. Fig. 6 is an outer side view of a portion of the commutator ring and part on which is mounted with the commutator blocks insulatingly spaced and the attached flange partly sawed into corresponding sections. Fig. 7 is a section of a portion of the commutator and its mounting, with a saw shown in dotted lines in the act of sawing the commutator flange into sections. Fig. 8 is a side view of a commutator ring clamped preparatory to having its inner surface machined to true the same and to remove the insulation flush with such surface, and Fig. 9 is a cross section of Fig. 8.

In the carrying out of my improved process for the manufacture and mounting of commutators on the rotors of electric motors, I first provide a ring or blank A of metal or other suitable conductive material, which has preferably been cast, machined, or otherwise suitably acted on to form a radially-projecting peripheral flange *a* at one side edge thereof, and with an inner peripheral dove-tail rib *b* for the purpose hereinafter described. The next step consists in radially sawing or otherwise suitably acting on the body of the blank so as to provide a multiplicity of equidistantly spaced blocks, bars or segments *c*, which are connected and held in ring form by the flange *a*, which is allowed to remain intact, or substantially so, as indicated in Fig. 5. The spaces between blocks *c* are then filled with mica, or other suitable insulating material *d*, and the whole is then preferably shellacked, or otherwise suitably treated with an insulating coat, and baked. Subsequent to the shellacking but previous to the baking, however, a clamping member B of any suitable form is clamped closely around the body of the blank to form a closely united or unitary mass of the blocks or bars *c* and insulation spacings *d*, as shown in Fig. 8. After the baking action the blank A, while still held by the clamping member B, is subjected to a machining operation to true the inner peripheral surface of same and to clean or trim all projecting insulating material therefrom flush with the surface of the blank. This having been done, the blank A, with the clamp still mounted thereon, is slipped over an end of the rim portion of a rotor hub or spider C with the inner side of the dove-tail rib *b* in abutment with a complemental rib *e* on such hub or spider. Previous to this, however, a strip of insulating cloth or material *f* is placed over the end of the hub or spider to insulate the commutator bars therefrom, see Fig. 4. The blank A having been placed on the rotor hub, a locking-ring *g* is slipped over the end of the hub against the outer side of the rib *b*, with the insulation *f* disposed between it and the ring A, and the edge of the hub is then expanded to secure the locking ring *g* against removal, or may be secured to the hub in any other suitable manner. While the securing of the

commutator bars to the rotor hub by the provision of the dove-tail *b* on the blank and the complemental engaging parts on the hub is the preferable method of doing the same, the blank may be secured to the shaft in any other suitable or convenient manner without departing from the scope of my invention. The commutator bars having been secured to the rotor hub, the clamping member B is removed therefrom and the flange *a* then radially sawed in register with and to the inner ends of the spaces previously formed between the blocks or bars *c*, as indicated in Fig. 7 and a portion of Fig. 6, thus providing an individual flange part for each block or bar. The saw employed for this purpose is preferably thicker than the saw used in separating the blank into the blocks or bars *c*, so that the air spaces between the block-flanges are of greater width than the insulations *d* between the blocks. This being done the commutator is in condition for the flanges of its blocks or bars to be connected to the terminals of the coils D of the armature is the usual or any suitable manner. The coils D are shown in the present instance as being wound on a Gramme or ring type of armature core E, which is mounted on the hub or spider C at the side of the commutator.

The advantage of my invention will be readily apparent to those skilled in the art as it is evident from the above that the commutator blank A remains an integrally connected unit until it has been mounted on and firmly secured to the rotor hub, after which it is separated into the individual insulated blocks or bars *c*, thus avoiding the handling of a multiplicity of blocks or bars in the building up of a commutator and the individually securing of each of such blocks to the rotor hub or other mounting, as has heretofore been the case in commutator construction.

While I have shown the commutator, the process of manufacture of which forms the feature of my present invention, as being associated with a certain type and construction of rotor, I wish it understood that the employment of my improved process is not thereby limited to use in such connection, as it may be used in connection with any type or construction of rotor for which it may be adapted or appropriate. I also wish it understood that my invention is not limited to the specific acts or steps described and illustrated, except in so far as such limitations are specified in the claims, as the primary or essential feature of my invention consists in severing an annular portion of a blank into segments, filling the spaces between such segments with insulation, mounting the blank on a motor part and firmly securing the segment parts thereto, and finally severing the remaining annular portion of the blank to entirely insulate the segments from each other. While the remaining steps described are preferable, such steps may be varied, or changed or omitted as may be desired without avoiding the scope of my invention.

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

1. The process of manufacturing commutators, consisting in providing a ring having a peripheral flange, separating the body of the ring into a plurality of spaced bars which are connected by said flange, filling the spaces between the bars with insulation, mounting and securing the ring on a mount, and then acting on the flange to sever the connections between the blocks to form individual upstanding terminal ears for each bar.

2. The process of manufacturing commutators, which consists in radially sawing an annular portion of a blank to provide a plurality of spaced segments connected by the remaining annular portion of the blank, inserting insulation between the segments, mounting and securing the blank in this form upon a mount, and then sawing the remaining integral portion of the blank to entirely insulate the first mentioned segments from each other, and to form an individual terminal attaching part for each segment.

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

FRANCIS P. HUYCK.

Witnesses:
STELLA E. THOMAS,
C. W. OWEN.