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C. V. GIAIMO

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METHOD OF MAKING COMMUTATORS

Filed Feb. 21, 1931

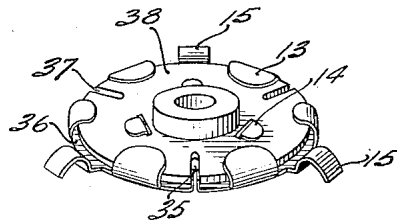
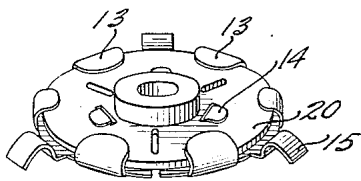
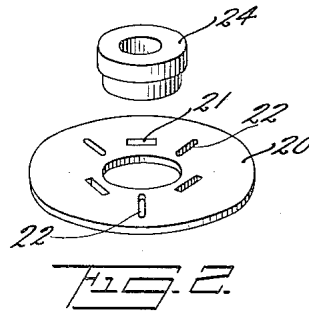
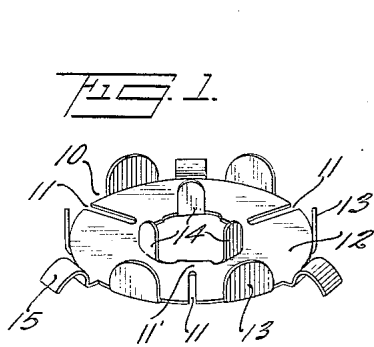


FIG. 3.

FIG. 4.

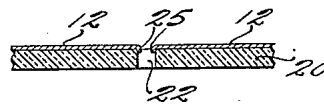
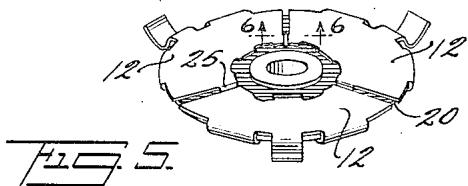


FIG. 5.

FIG. 6.

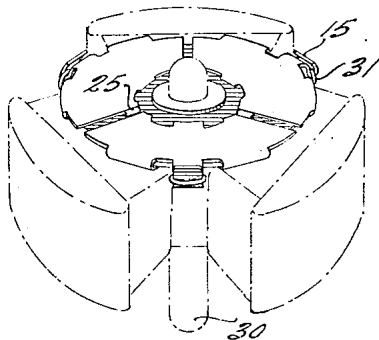


FIG. 7.

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METHOD OF MAKING COMMUTATORS

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The present invention relates to commutators and methods of making the same and is more particularly directed toward the manufacture of disk type commutators for small motors.

The present invention contemplates the manufacture of commutators of this type out of two comparatively small stamped parts, one of metal and the other of insulating material.

The metal stamping is partially severed to form segments and each of the segment forming elements is provided with prongs adapted to be bent against the insulating disk when the two parts are assembled together. The metal stamping may also be provided with integral armature lead connection lugs. The insulating element is in the form of a flat disk which may be punched from insulating sheet material.

The accompanying drawing shows, for purposes of illustrating the invention two of the many possible embodiments in which it may take form, together with the steps employed in making the commutator, it being understood that the drawing is illustrative of the invention rather than limiting the same.

In the drawing:

Figure 1 is a perspective view of one form of metal stamping;

Figure 2 is a perspective view of one form of insulating disk or stamping, and hub;

Figure 3 is a perspective view of the commutator from the rear side, the parts having been secured together;

Figure 4 is a view similar to Figure 3 of a modified form of construction;

Figure 5 is a perspective view of the face side of the finished commutator;

Figure 6 is a fragmentary section of line 6-6 of Figure 5; and

Figure 7 is a perspective view illustrating the commutator attached to a motor armature.

The sheet metal stamping 10, shown in Figure 1, is of annular shape and has radial slits 11 extending partially across the face so as to partially sever the stamping into segment forming elements 12, these elements be-

ing held together by webs 11'. Each of these segment forming elements is provided with two prongs 13-13 at the periphery and with interiorly disposed prongs 14. As shown in the drawing each segment forming portion 12 also has an outwardly extending lug 15 for connection to the armature leads. This stamping is formed out of a single blank of sheet metal by stamping an annular sheet metal body having radial slits 11, prongs 13 and 14, and lugs 15. These prongs and lugs are bent out of the plane of the body so that they all project in the same direction as indicated in Fig. 1.

The insulating disk 20 shown in Figure 2 is of such a size as to fit inside the prongs 13 and has slots or openings 21 adapted to receive the prongs 14. It also has radially extending openings 22 which come opposite the webs 11' when the insulating disk is placed on the metal disk. A hub 24 may be secured to the insulating disk if desired.

In assembling the two stamped parts the insulating disk is placed in position on the metal disk and the prongs 13 and 14 bent over as indicated more clearly in Figure 3, thereby firmly securing these two parts together. A punching tool is then brought against the metal disk so as to cut away the webs 11' as indicated at 25. This tool is shaped so that the metal of the web is first slit and then bent inwardly against the side walls of the holes or openings 22 as indicated in Figure 6. This operation not only separates the segment forming elements into distinct segments but provides anchoring lugs which grip the insulating material and prevent shifting of the segments relative to the insulating base. This completes the manufacture of the commutator and provides a very small, compact and efficient device suitable for toy motors and the like.

This commutator may be forced onto the armature shaft 30 of the motor and the armature leads connected to the commutator segments by winding them about the lugs 15 as indicated at 31 in Figure 7. The lugs can then be pinched together to securely grip the wires. Soldering may, of course, be employed if desired. It will be noted that these

lugs are shaped so that they do not project beyond the working face of the commutator. Neither do they project inwardly beyond the inner face of the commutator.

5 In the modified construction shown in Figure 4 the slots 35 in the metal stamping 36 are arranged so that they extend outwardly from the central opening, and the holes 37 in the insulating disk 38 become notches as indicated. The parts are assembled in the manner described above.

10 It is obvious that the invention may be embodied in many forms and constructions within the scope of the claims, and I wish it to be understood that the particular forms shown are but two of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

20 I claim:

1. In commutator manufacture, the method which comprises forming a piece of sheet metal into an annular body with radial slots which partially sever it into segments, forming integral prongs at the periphery of each segment and at the inner edge of each segment, bending all the prongs out of the plane of the body so that they project in the same direction, then placing an annular disk of insulating material against the metal body, and folding the prongs against the disk to secure it to the metallic body.

2. In commutator manufacture, the method which comprises forming a piece of sheet metal into an annular body with radial slots which partially sever it into segments, forming integral prongs at the periphery of each segment and at the inner edge of each segment, bending all the prongs out of the plane of the body so that they project in the same direction, then placing an annular disk of insulating material against the metal body, folding the prongs against the disk to secure it to the metallic body, and then completely severing the segments apart.

3. In commutator manufacture, the method which comprises forming a piece of sheet metal into an annular body with radial slots which partially sever it into segments, forming integral prongs at the periphery of each segment and at the inner edge of each segment, bending all the prongs out of the plane of the body so that they project in the same direction, placing an annular disk of insulating material against the metal body, the disk having holes opposite the webs which hold the segments together, folding the prongs against the disk to secure the same to the metal body, severing the webs and forcing the adjacent material of the metal stamping into the holes in the insulating disk.

4. The method of commutator manufacture which comprises stamping a sheet metal blank into the form of an annular disk having radial slots partially severing it into seg-

ments and providing each of said segments with upstruck peripheral and inner prongs, providing an insulating disk of a size to be received within the peripheral prongs and having holes to receive the inner prongs, placing said disks together, folding the prongs over onto the insulating disk, and extending the radial slots to completely sever the metal disk into segments.

5. The method of commutator manufacture which comprises stamping a sheet metal blank into the form of an annular disk having radial slots partially severing it into segments and providing each of said segments with upstruck peripheral and inner prongs and with radially projecting armature connection lugs, providing an insulating disk of a size to be received within the peripheral prongs and having holes to receive the inner prongs, placing said disks together, folding the prongs over onto the insulating disk, and extending the radial slots to completely sever the metal disk into segments.

6. The method of commutator manufacture which comprises securing a metallic disk having radial slots which partially divide it into segments connected together by webs to an insulating disk having holes opposite the webs, severing these webs and forcing the adjacent material into the holes to form prongs to grip the hole walls.

Signed at Irvington, in the county of Essex and State of New Jersey, this 13th day of February, 1931.

CHARLES V. GLAIMO. 100

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