No. 653,945. Patented July 17, 1900.

J. BURKE.

COMMUTATOR SEGMENT.

(Application filed Jan. 27, 1899.)

(No Model.)

Fig. 1.

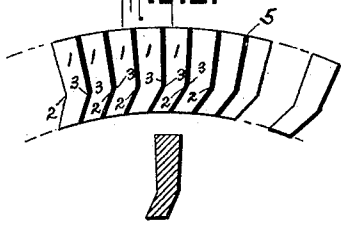


Fig. 2.

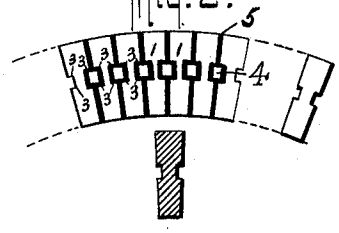


Fig. 3.

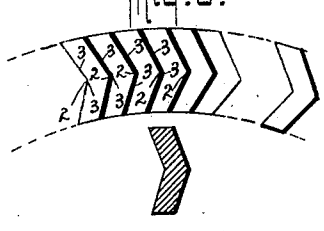


Fig. 4.

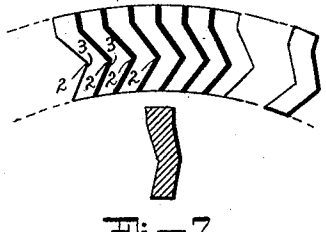


Fig. 5.

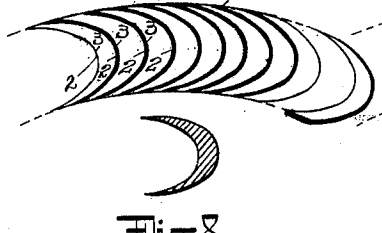


Fig. 6.

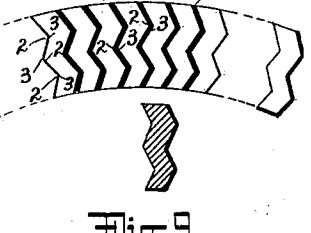


Fig. 7

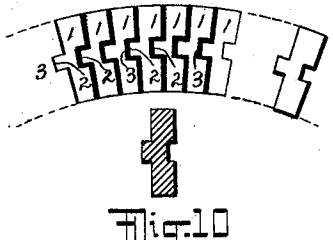


Fig. 8.

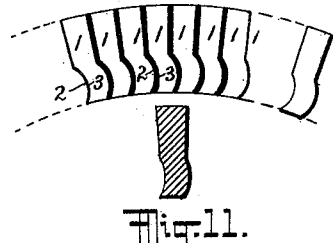


Fig. 9.

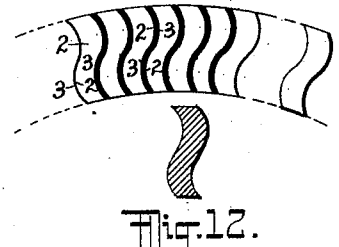


Fig. 10

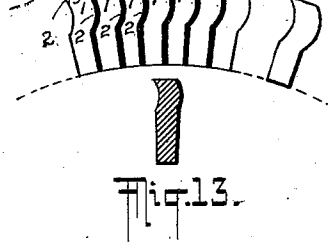


Fig. 11.

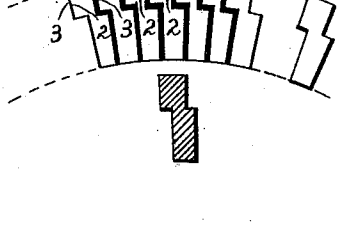


Fig. 12.

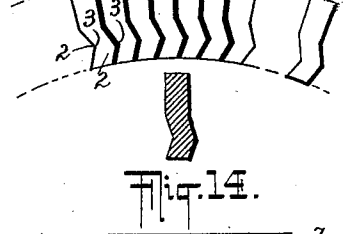


Fig. 13.

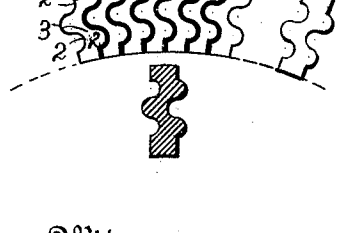
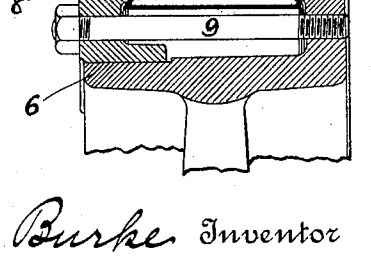


Fig. 14.



Witnesses
Fletcher D. Hallock
Geo. M. Hess.

James Burke Inventor
By his Attorney C. V. Edwards.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES BURKE, OF NEW YORK, N. Y.

COMMUTATOR-SEGMENT.

SPECIFICATION forming part of Letters Patent No. 653,945, dated July 17, 1900.

Application filed January 27, 1899. Serial No. 703,593. (No model.)

To all whom it may concern:

Be it known that I, JAMES BURKE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Commutator-Segments, of which the following is a full, clear, and exact specification.

My invention relates to commutator-segments; and one object is to make a commutator-segment which shall not be liable to displacement from its normal position in the commutator from any of the causes incident to the construction or operation of motors or generators.

A further object is to provide a construction in which the insulation placed between the segments shall be prevented from working out of place.

In commutators as they are at present constructed it often happens that in assembling the segments to form the commutator one or more of the segments may be forced slightly below or slightly above the circumference of the commutator or become otherwise displaced. At times after the commutator has been assembled and put in operation one or more of the segments or parts of segments become displaced from their normal positions from various causes, among which may be mentioned the very common cause of centrifugal force. The same is also true to a large extent of the insulation placed between the individual segments. When this occurs, sparking, damage to the brushes, or other injury necessarily results. In the usual form of commutators the segments are held down to a commutator-shell with intervening insulating material and the segments are held collectively in place, the individual segments being dependent for remaining in position upon the accuracy of the machine-work upon the segments and other parts and upon the accuracy of the intervening insulation. I propose to construct a commutator-segment which may be readily clamped with the other segments to form an accurately-made commutator and which when the commutator is assembled shall not be liable to displacement or to relative movement with respect to the other segments.

The invention will be more particularly described hereinafter with respect to the accompanying drawings, in which I have illustrated a number of forms which the invention may take in practice.

In the drawings, Figures 1 to 13, inclusive, are sectional end views of a number of commutator-segments constructed in accordance with my invention; and Fig. 14 is a sectional view of a portion of a commutator, illustrating one of the common methods of clamping the segments together.

Referring more particularly to the drawings, 1 1 1 1, &c., represent the commutator-segments, which may be of any suitable size or shape. The shape of these segments will vary in different machines and according to which one of the many methods of clamping the segments together is employed.

2 2 2 2, &c., are shoulders or projections upon the sides of the segments, and 3 3 3 3, &c., are recesses into which such shoulders are adapted to fit.

In the drawings the segments are each shown provided with one or more projections and one or more recesses, except in Fig. 2, where each segment is provided with a recess 3 on both sides, and an independent tongue-piece 4 is inserted in the recesses; but, if preferred, segments carrying shoulders on both sides or recesses on both sides may be employed, the segments with the shoulders being alternated with those having the recesses. The insulation between the segments is represented in the drawings by 5.

In Fig. 14, 6 represents the commutator shell or body, carrying a rigid clamping-piece 7 and a movable clamping-piece 8, the latter being adjustable by means of one or more bolts 9. The commutator-segment 1 is provided with a tapered extension 10, against the ends of which the clamping-pieces are adapted to press. If preferred, the commutator-segments herein described may be clamped together in a similar manner, the segments being made of suitable shape—as, for instance, as shown in Fig. 14. This, however, is not an essential feature, inasmuch as any method of clamping the segments together may be utilized.

In practice it will be found desirable to avoid the use of sharp corners as far as possible in the construction of the segments, for

the reason that the sharp corners are apt to cut and destroy the insulation between the segments. I therefore prefer to use those forms of the invention employing rounded edges.

In the use of the segments above described the segments are assembled in any of the well-known ways, the segments being arranged relatively to each other, as hereinbefore described.

It is obvious that with the above-described construction the segments will be interlocked with each other, and it will be impossible for the segments or any of them to work up or down from their normal positions or for the insulation to work out of its proper position. It will also be observed that the invention herein described provides a simple means for effectively preventing radial displacement of straight commutator-segments having straight surfaces, as well as segments of other shapes.

I believe myself to be the first to completely prevent radial displacement of commutator-bars, and, further, to be the first to employ for this purpose interlocking segments or segments with distorted faces, or other similar means, whether integral with the commutator-bars or not, and I, therefore, desire to claim these features broadly, whether used in the forms shown or in others substantially equivalent thereto.

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

1. In a commutator, the combination of counterpart segments having straight surfaces, suitable insulation, and securing devices, the segments being interlocked against radial displacement.

2. In a commutator, the combination of a plurality of segments, each of said segments having a recess on one side and a projection on the other side, and means for clamping said segments together, substantially as described.

3. In a commutator, the combination of a plurality of segments, one or more of said segments having a recess upon one side thereof, and means carried by an adjacent segment engaging with the recess and preventing radial movement of the segments with respect to each other, substantially as described.

4. In a commutator, the combination of a plurality of segments, one of said segments having a recess on one side thereof, a projection carried by an adjacent segment and adapted to fit in said recess, and means for clamping said segments together, substantially as described.

5. In a commutator, the combination of a plurality of segments, means carried by said segments for preventing movement of the segments relative to each other in a radial direction, and means for clamping said segments together, substantially as described.

6. In a commutator, the combination of a plurality of segments, means, substantially as described, for preventing radial displacement of the segments with respect to each other, and means for clamping the segments together.

7. In a commutator the combination of a plurality of segments having straight surfaces adapted to be held together, and means for interlocking the adjacent segments with each other whereby relative movement of the same is prevented, substantially as described.

8. In a commutator, the combination of a plurality of segments and insulating material between the adjacent segments, said segments having irregular surfaces adapted to impinge against the adjacent insulating material, substantially as set forth.

9. As a new article of manufacture, a commutator-segment having distorted sides arranged to prevent radial displacement.

10. As a new article of manufacture, a commutator-segment having straight surfaces having distorted sides arranged to interlock similar sides upon other segments.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES BURKE.

Witnesses:
C. V. EDWARDS,
GEO. W. HESS.