

(No Model.)

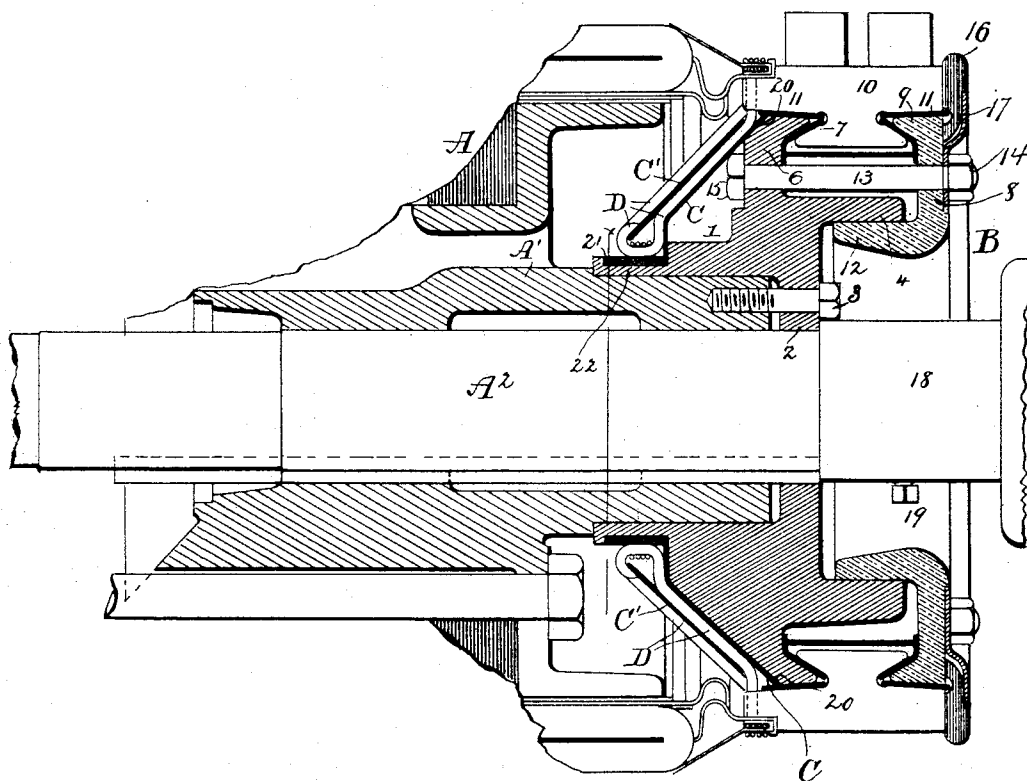
2 Sheets—Sheet 1.

J. P. B. FISKE.
COMMUTATOR.

No. 538,825.

Patented May 7, 1895.

Fig. 1



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Fig. 2.

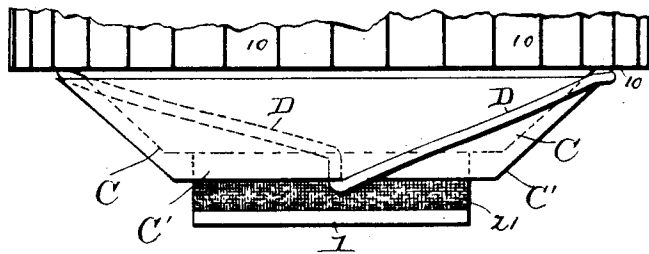
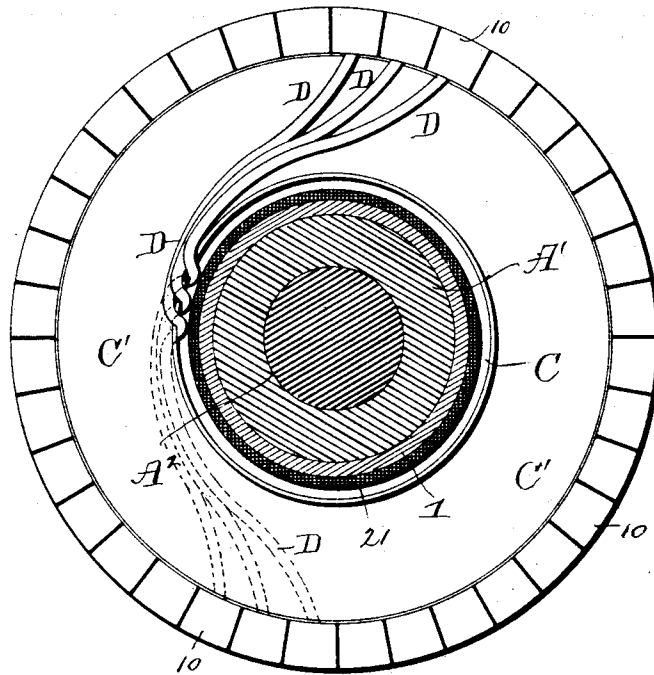


Fig. 3.

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UNITED STATES PATENT OFFICE.

JONATHAN P. B. FISKE, OF ALLIANCE, OHIO.

COMMUTATOR.

SPECIFICATION forming part of Letters Patent No. 538,825, dated May 7, 1895.

Application filed February 9, 1895. Serial No. 537,782. (No model.)

To all whom it may concern:

Be it known that I, JONATHAN P. B. FISKE, a resident of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in 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.

My invention relates to an improvement in commutators for electric motors and dynamo electric machines, and particularly to an improvement in the cross connections of the commutator segments,—one object being to so construct and arrange said cross connections that they shall occupy a minimum amount of room and thus result in a saving of space which can be otherwise utilized to advantage.

A further object is to arrange the cross connection of a commutator in such manner that the required number of such connections can be employed and made to occupy a comparatively small amount of space without cramping them.

A further object is to construct the cross connections of the commutator in such manner that they may be easily and quickly placed in position; so that the commutator need not be made to stand a distance from the end of the armature winding to allow the attachment of said connection, and so that the cross connections, as a whole, will project within the outer edge of the armature winding.

A further object is to produce a commutator and its cross connections which shall be simple in construction, cheap to manufacture, easy to place in position and possess advantages not attained by such devices as heretofore constructed, so far as I am aware.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts as hereinafter set forth and pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional view illustrating my improvements. Fig. 2 is a sectional view on the line *x x* of Fig. 1. Fig. 3 is a detail view illustrating the cones with one of the cross-connections in place.

A represents one end of an armature; A',

a hub projecting from one end of the core thereof, and A² the armature shaft.

On the hub A', my improved commutator B is located. In constructing this commutator, a sleeve 1 is mounted on the hub A' and provided with an annular inwardly projecting flange 2, lying flush with the end of said hub, and having perforations for the accommodation of screws 3, or other fastening devices which are made to enter the end of the hub. The sleeve 1 is also made with a forwardly projecting annular flange 4, concentric with the armature shaft and with an outwardly projecting flange 6, the free edge of which is made with a rib 7.

A ring or cap 8 is disposed parallel with the flange 6 and made at its outer edge with a rib 9, between which and the rib 7, the commutator segments 10 are located and electrically separated therefrom by means of insulation 11. The ring or cap 8 is made with a rearwardly projecting annular flange 12 lying within and flush with the forwardly projecting flange 4 and said ring or cap is held in place by means of bolts 13 passing through and through the outwardly projecting flange 6, said bolts being provided on their respective ends with nuts 14, 15, or one end of each bolt may be provided with a nut and the other end with a head.

A ring 16 of insulating material is placed against the outer or forward edges of the commutator segments and overlaps the ring or cap 8, said insulating ring being retained in place by means of a ring 17 (preferably of brass), and the ring 17 is held in position by the heads or nuts 14 on the bolts 13.

A sleeve 18 will preferably be placed on the armature shaft A² and made to bear at its respective ends against the flange 2 and the journal bearing of said shaft. A set screw 19 is passed through said sleeve and made to engage the armature shaft.

It will be observed that the rear edge of the flange 6 is beveled to produce an inclined seat 20 for the larger end of a cone or conical shell C of insulating material, the smaller end of said cone having its bearing on insulating material 21 in a recess 22 made at the rear end of the sleeve 1 of the commutator framework. Another cone or conical shell C' of insulating material, is disposed parallel with the cone

C and a distance therefrom about equal to the thickness of a wire of the cross connections and its insulator, said cone C' being held in place by the wires of the cross connections

5 D. In arranging the cross connections D, a wire is connected at one end to a commutator segment, then passed over the face of the cone C, then bent over the smaller end of said cone; then laid on the face of the outer cone and

10 finally connected with the diametrically opposite commutator segment, the wires where they lie on the faces of the respective cones preferably being somewhat curved, the curve of each wire on one cone being the reverse to

15 the curve on the other cone. The next cross connection will be arranged in precisely the same manner and disposed parallel throughout its length with the first wire and so on until all the cross connections shall have been

20 placed in position.

From this construction and arrangement of parts it will be seen that one half of all the cross connections will be parallel with each other on one surface, and the other half of all

25 the cross connections will be parallel with each other on a different surface; that one half of the connections will cross the other half with an interposed insulation; that all the cross connections will occupy but two surfaces parallel with each other and that the thickness or cross section of the whole cross connection at a given point is only equal to the diameter

30 of two wires, their insulation and the thickness of the wall of the two cones of insulating material.

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It will also be observed that my improvement results in a great economy of space which can be utilized for other purposes. The cross connections occupy a very small

40 space and, as they extend within the outer edge of the armature winding, the commutator can be arranged close to the ends of the armature core, resulting in the employment of comparatively short cross connections and

45 a consequent reduction of the resistance thereof to a minimum.

By the employment of the conical arrangement above described the heads or nuts will occupy the space inclosed by the cones

50 and need not be countersunk.

My improvements are exceedingly simple in construction, easy to assemble and effectual in all respects in the performance of their functions.

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

1. Cross connections for a commutator consisting of a series of wires arranged in conical form, one half of each wire of the series lying parallel with one surface and the other half of each wire of said series lying parallel with another surface parallel with the first mentioned surface, substantially as set forth.

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2. Cross connections for a commutator comprising wires arranged in conical form, the wires composing said cross connections being so bent between their ends that one half of all the wires will be disposed a different distance from the end of the commutator than

65 the other half of all the wires, substantially as set forth.

3. The combination with a conical shell, of commutator cross sections so arranged that one half of each wire composing said cross connections will lie parallel with one face of said conical shell and that the other half will lie parallel with the other face thereof, substantially as set forth.

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4. The combination with a commutator, of two conical shells arranged parallel with each other, and cross connection wires disposed on said conical shells, one half of each wire lying on one conical shell and the other half of each wire lying on the other conical shell, substantially as set forth.

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5. The combination with an armature and a commutator, of cross connections for the commutator projecting within the end of the armature winding, substantially as set forth.

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6. The combination with an armature, of a sleeve secured to the hub thereof, a flange projecting from said sleeve, cross connections supported by said sleeve and flange, a plate or cap, bolts securing said plate or cap and flange together, commutator segments between the flange and plate or cap, and interlocking flanges projecting from said plate or cap and said sleeve, substantially as set forth.

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7. The combination with a sleeve adapted to be secured to an armature core, a flange on said sleeve, a plate or cap, commutator segments between said flange and plate or cap, and bolts passing through the flange and plate or cap, of a conical shell supported by the sleeve and flange, another conical shell disposed parallel with the first conical shell, and cross connections for the commutator segments, one half of each cross connection lying on one conical shell and the other half lying on the other conical shell, substantially as set forth.

100 105 110

8. The combination with an armature, of a sleeve secured to the hub thereof, a flange projecting from said sleeve, a plate or cap, bolts securing said plate or cap and flange together, commutator segments between the flange and plate or cap and interlocking flanges projecting from said plate or cap and said sleeve, substantially as set forth.

115 120

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JONATHAN P. B. FISKE.

Witnesses:

R. S. FERGUSON,
C. S. DRURY.