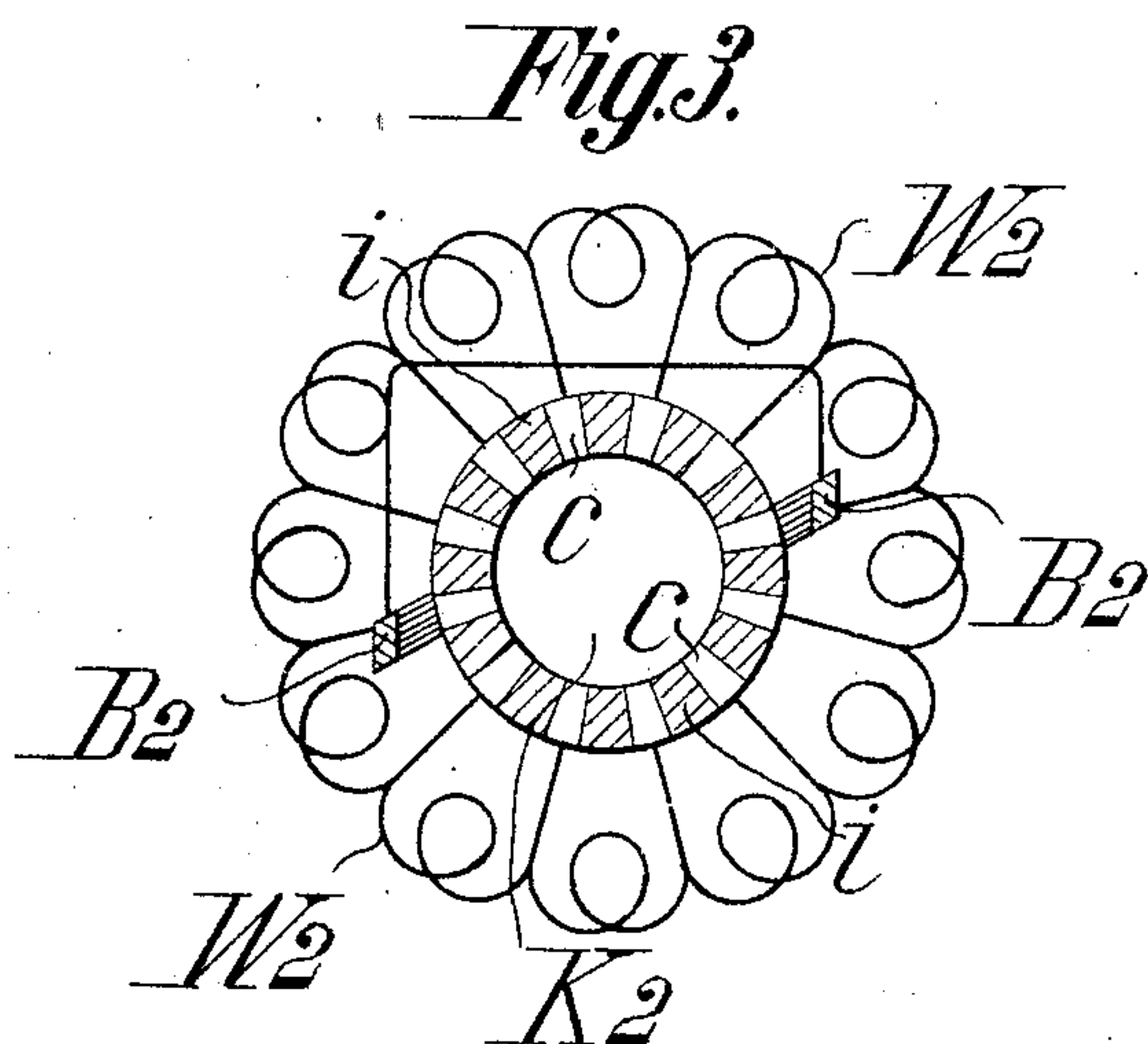
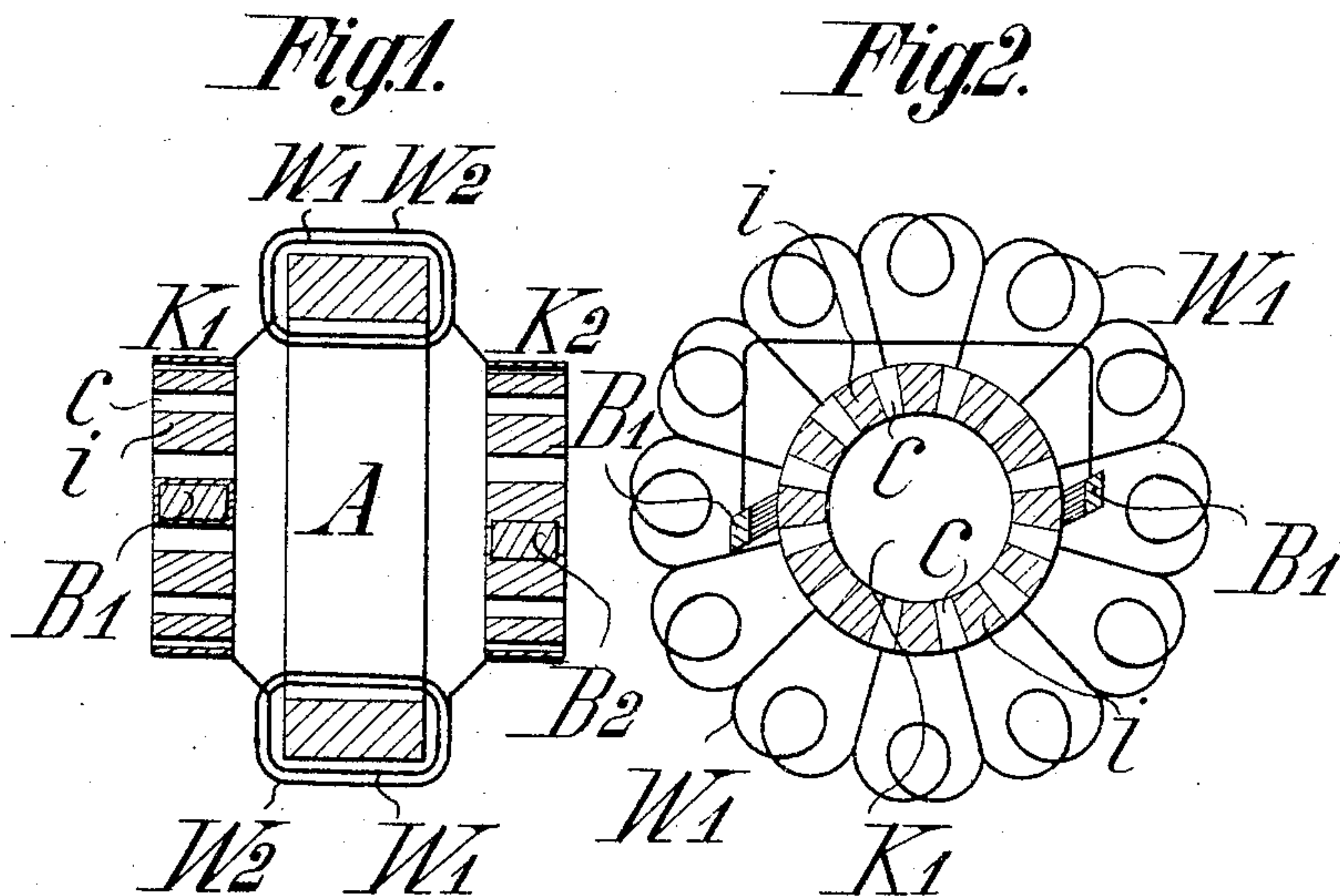


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M. DÉRI.
COMMUTATING DEVICE FOR ARMATURES OF ALTERNATING CURRENT
MACHINES.

APPLICATION FILED MAR. 31, 1903.



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UNITED STATES PATENT OFFICE.

MAX DÉRI, OF VIENNA, AUSTRIA-HUNGARY, ASSIGNOR TO STANLEY ELECTRIC MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

COMMUTATING DEVICE FOR ARMATURES OF ALTERNATING-CURRENT MACHINES.

SPECIFICATION forming part of Letters Patent No. 786,010, dated March 28, 1905.

Application filed March 31, 1903. Serial No. 150,487.

To all whom it may concern:

Be it known that I, MAX DÉRI, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Commutating Devices for Armatures of Alternating-Current Machines; 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 letters of reference marked thereon, which form a part of this specification.

My invention relates to alternating-current machines of the commutator type; and its object is to provide a novel construction and arrangement of such machines which shall enable them to operate sparklessly.

In alternating-current machines having commutator-armatures injurious currents are induced by the alternating field in the coils as they are short-circuited under the brushes. To remedy this, it has been proposed to provide the armature with two windings and to connect these alternately with the laminæ of a common commutator. If with this arrangement the brushes are made narrower than any one of the laminæ, direct short-circuiting of the coils may indeed be avoided. Nevertheless two armature-circuits of different tension will be connected in parallel by the brushes, so that here also there is a closed circuit in which currents are set up corresponding with the difference of tension.

The commutating device which is the subject-matter of the present invention, using also two armature-windings, renders impossible the generation of injurious currents by short-circuiting or connecting together parts of the windings of the armature. In this arrangement each winding is provided with a separate commutator, also with separate brushes and brush connections, whereby the two circuits of the armature in their whole extent are separated from each other. The insulating-strips between the laminæ of the com-

mutator are made broader than the brushes, so that each armature-circuit is entirely interrupted as often as the brushes pass between two laminæ. The position of the brushes relatively to the laminæ is different in the two commutators. The periodical interruptions of the two armature-circuits are thus different in point of time relatively to each other and in such a manner that the moment of interruption at the one commutator is coincident with the complete contact of the brushes at the other. It follows that at each instant there is at least one circuit of the armature closed.

In the accompanying drawings, Figure 1 is a diagrammatic longitudinal section through the armature and commutators; and Figs. 2 and 3 are diagrammatic cross-sections through the two commutators, respectively, which are disposed on both sides of the armature.

The armature-winding W' is connected with the commutator K' , and W'' with K'' . The brushes B' of the first commutator are on insulating-strips i , while brushes B'' of the second collector are on contact-strips c . As shown, the width of the strips and of the brushes and the relative position of the latter are so chosen that no brush can come in contact at the same time with two adjacent contact-strips and that whenever the one circuit is broken the other is completely closed.

The insulating-strips may be of any suitable material, even one which is an electrical conductor, provided it is well insulated from the contact-strips.

The two commutators may be united in one piece, but in every case the laminæ of each must be independent of or insulated from those of the other in such a manner that the brushes never may effect any direct or indirect communication between the two circuits.

Both windings should include commonly the whole armature-field and be as near each other as possible, so that there may not be an appreciable leakage between the coils of the two. The electromotive force in the closely-interlinked circuits will thus be unaffected by the interruptions during commutation, and the

currents in the two circuits will alternately vary between zero and total current in inverse proportion to the ohmic resistance or approximately to the contact resistance at the brushes.

5 The current density under the brushes will therefore approximately remain constant, bringing about a commutation as sparkless as possible.

10 The commutating device according to this invention is not limited to the arrangement in which the brushes of both commutators are short-circuited, but is applicable when the brushes of each commutator are in circuit with a separate source of alternating current
15 of constant tension or with a separate inductive resistance.

The application of this commutating device to multipolar and to polyphase armatures is quite analogous to the above arrangement.

20 The breaking and making of the contacts at each commutator may occur simultaneously. Either all of the homologous brushes of a collector may be connected together or there may be a separate circuit between each pair
25 of brushes. In similar manner there may in certain cases be more than two windings on one armature with a corresponding number of separate commutators.

I claim—

30 1. In an alternating-current dynamo-electric machine, independent windings on the armature, and an independent commutator and brushes for each winding, said commutators and brushes being arranged to close and break
35 the circuits of said windings alternately.

2. In an alternating-current dynamo-electric machine, independent windings on the armature, and an independent commutator and brushes for each winding arranged to make
40 and break the circuit of said winding.

3. In an alternating-current dynamo-electric machine, independent windings on the arma-

ture, a commutator for each winding having alternate conducting and insulating segments, and a set of brushes for each commutator so
45 positioned that one set of brushes is on conducting-segments at the instant the other set is on insulating-segments.

4. In an alternating-current dynamo-electric machine, independent windings on the arma-
50 ture, and a commutator and set of brushes for each winding, the insulation between adjacent commutator-segments being wider than a brush.

5. In an alternating-current dynamo-electric
55 machine, independent armature-windings, and a commutator and set of brushes for each winding, the insulation between adjacent commutator-segments being wider than a brush, and said brushes being so positioned that one
60 set is on the insulation between segments when the other set is in contact with the segments of its commutator.

6. In a commutating device for armatures of alternating-current machines, the combination
65 with the armature, of a plurality of separate armature-windings, a plurality of commutators, one for each armature, each of said armature-windings being connected to the collectors of a corresponding armature, and brushes
70 and brush connections for each commutator, said sets of windings, collectors, brushes and brush connections forming independent circuits, the insulating-strips of the armatures being broader than the brushes, substantially
75 as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

MAX DÉRI.

Witnesses:

JOSEF RUBARCH,
C. B. HURST.