

(No Model.)

R. EICKEMEYER.
DYNAMO ELECTRIC MACHINE.

No. 413,363.

Patented Oct. 22, 1889.

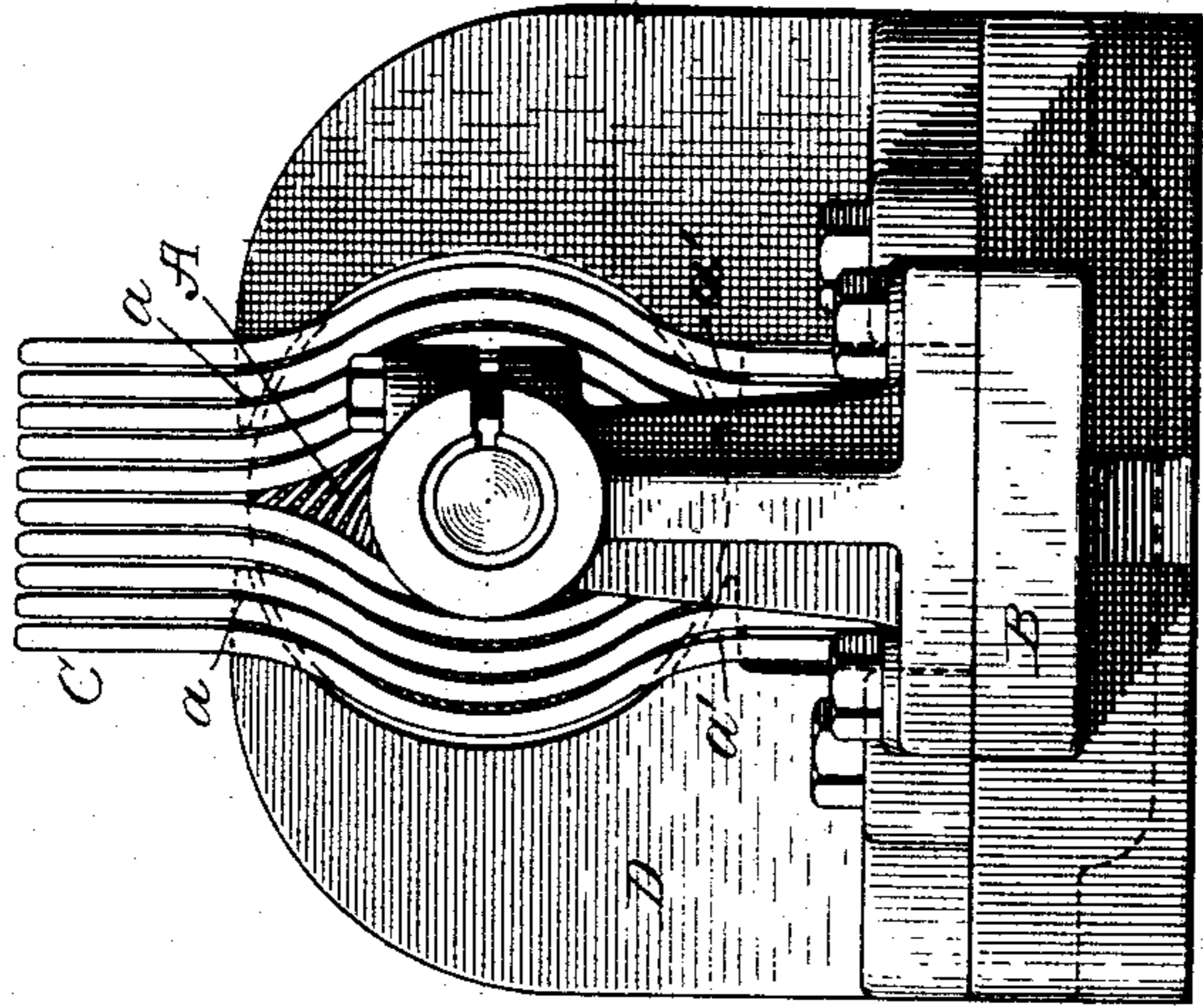


Fig. 1.

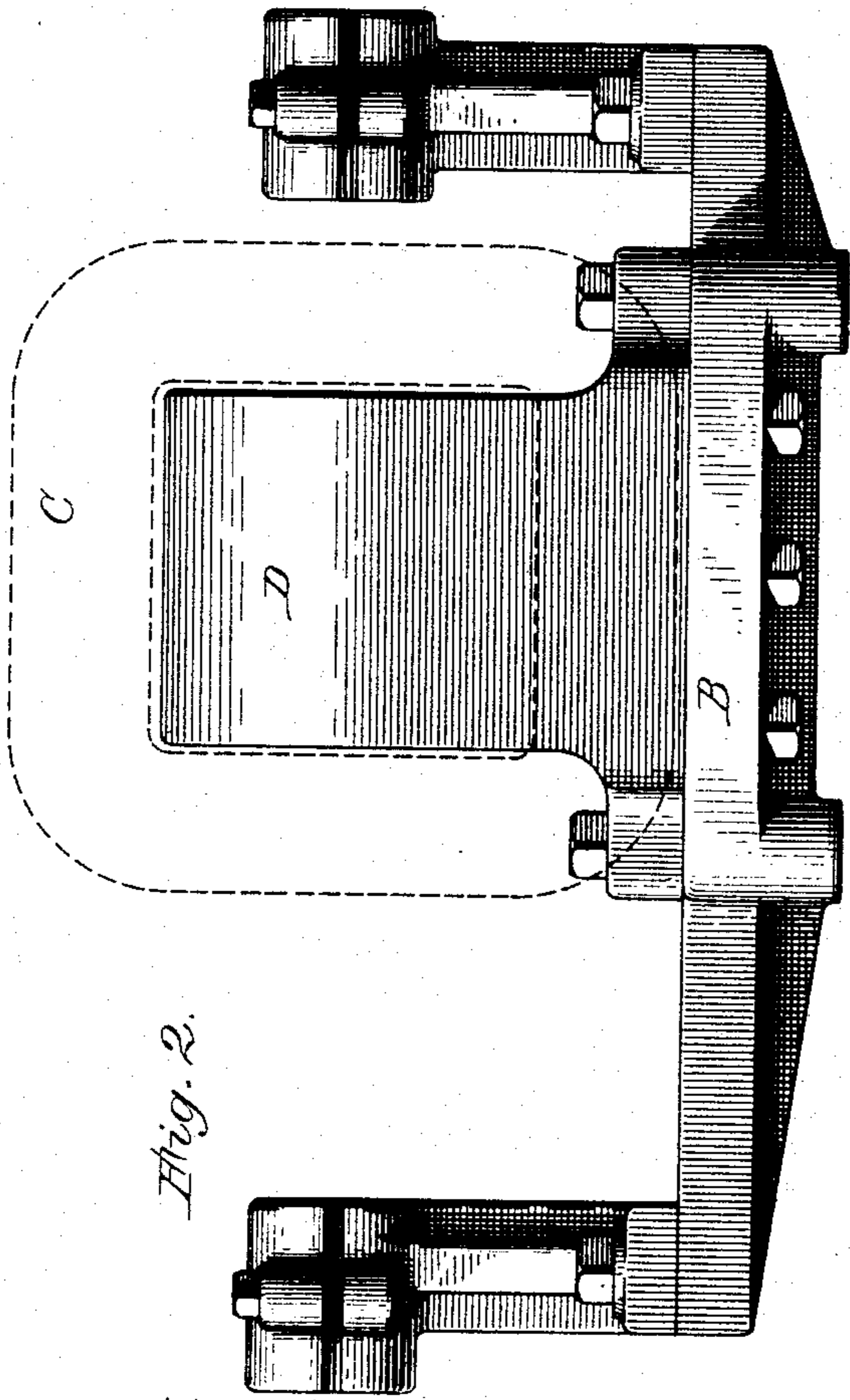


Fig. 2.

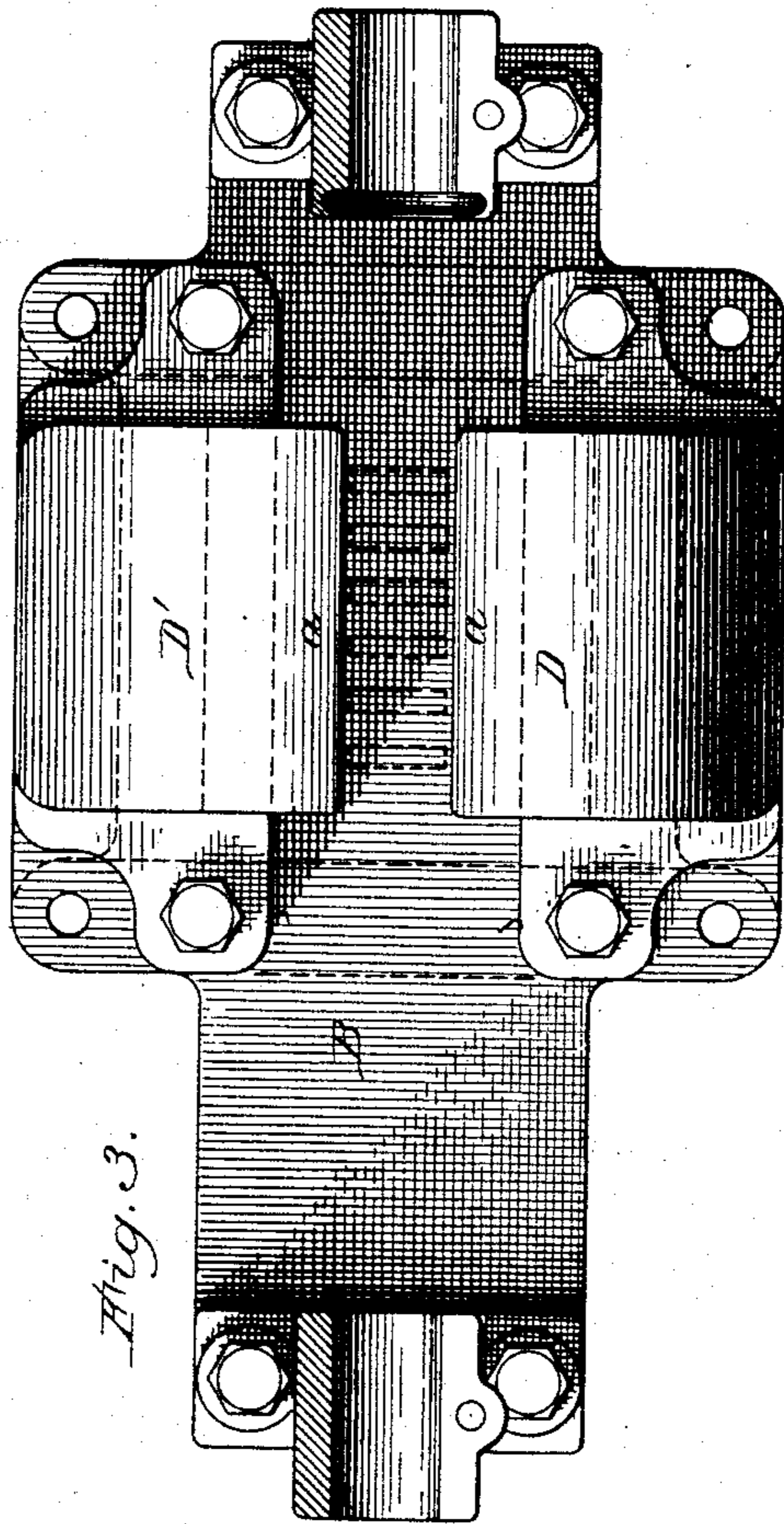


Fig. 3.

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UNITED STATES PATENT OFFICE.

RUDOLF EICKEMEYER, OF YONKERS, NEW YORK.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 413,363, dated October 22, 1889.

Application filed February 2, 1889. Serial No. 298,443. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF EICKEMEYER, of Yonkers, in the county of Westchester, in the State of New York, have invented certain
5 new and useful Improvements in Dynamo-Electric Machines; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and
10 complete description of my invention.

Machines embodying my present improvements are suited for use either as electric generators or as motors, and, like certain other machines heretofore devised by me, they have
15 no appreciable external magnetism, because the magnetic circuit is completed within the iron portions of the machine. In each of my said prior machines the field-coils surround and directly polarize the iron core of the
20 armature, and an iron shell or casing incloses the armature and the field-coils; but I have now so devised and organized the field-coils and the magnetic portion of the machine that although the coils surround and directly
25 polarize the armature-core more than three-quarters of their bulk is located in the open air, and as results of my invention the liability of undue heating the field-coils is wholly obviated, and the machines have little or no
30 external magnetism, are highly efficient, are comparatively light in weight, and are simple and economical in their construction.

After describing the machine illustrated in the drawings the several features deemed
35 novel will be specified in the several claims hereunto annexed.

Referring to the drawings, Figure 1 in end elevation illustrates a machine embodying my present improvements in what I deem
40 their best form. Fig. 2 is a side elevation of the magnetic portion of the machine without the armature, but with the field-coils shown in dotted lines. Fig. 3 is a plain view of the main parts shown in Fig. 2, the bearings for the armature-shaft being shown in horizontal
45 section.

The drum-shaped armature A (shown only in end view in Fig. 1) may be widely varied in its character without in any manner affecting certain portions of my invention; but for
50 obtaining the best results its core should be

composed of magnetic metal, as in many of my prior machines. The armature-shaft is mounted in split bearings, preferably in connection with split bushings, so that wear can
55 be readily compensated, and these bearings are on standards which are bolted to the ends of a bed-plate B, which may or may not constitute a part of the magnetic portion of the machine, as will be hereinafter explained. 60

The field-coil C is substantially rectangular in form, and is similar to others heretofore employed by me, and in this instance it is constructed in two divisions, each containing
65 five slightly-separated parts, and they are so formed and arranged that while resting edge-wise on the bed-plate all of them will inclose the armature longitudinally and directly polarize it, and one half of them at the ends
70 of the armature will be on one side of the armature-shaft and the rest on the other side, as clearly indicated in Fig. 1.

Two check-pieces D D', of magnetic metal, are vertically arranged to occupy proper positions with relation to the armature—one on
75 each side thereof—and they are bolted to the bed-plate B, which is in this instance of iron, and it in part constitutes a portion of the magnetic system in the machine; but if between said plate and the cheeks a heavy plate
80 of iron be interposed the bed-plate may be wholly outside of the magnetic system. These cheeks have concaved faces and are partially inclosed by the field-coil, because they are about of the same length as the armature,
85 and each at its top is extended toward the other, as at *a*, beneath the upper side of the field-coil, and also as at *a'*, beneath a portion of the armature and above the lower side of the field-coil, as is clearly indicated in Fig. 1. 90
The lower side of the coil is so confined between the bases of the two cheeks, and also between the base-plate and the lower projections *a'*, as to securely hold the coil in its vertical position. With the inward projec-
95 tions *a* and *a'* on the cheeks, as shown, the best results will accrue; but said cheeks may be wholly outside of the inclosing-plane of the field-coil without departure from certain portions of my invention, and so, also, might
100 the top of the coil be protected from injury by a skeletonized housing or screen without

in any manner affecting any portion of my invention.

The combination of the concaved vertical cheek-pieces in magnetic circuit at their bases and the field-coil interposed between them and inclosing portions thereof is, I believe, broadly new and of value, without reference to the character of the armature which may occupy the space afforded within the coil and between the concave faces of the cheeks, although for obtaining the best results the armature-core should be composed of magnetic metal.

It will be seen that only a portion of the lower sides of the field-coil is inclosed, and that the two ends and the upper side of the coil are located in the open air, and hence the coil is as fully exposed to cooling influences as I believe it to be possible in a machine wherein the field-coils directly polarize the armature, or in a machine wherein the magnetic circuit is completed. It will also be seen that the field-coils will develop opposite poles at the two sides of the iron core of an armature, and that the magnetic circuit will be completed within the metal of the two cheek-pieces and the bed-plate by which they are magnetically connected, thus obviating any appreciable external magnetic field; and it is obvious that by unbolting either cheek-piece from the base-plate the corresponding half of the field-coil may be readily removed and the armature-winding rendered fully accessible; also, that the bulk and weight of magnetic metal and bed-plate may be reduced to the lowest possible requirement, and that such a machine is extremely simple and economical in its construction.

For affording special facilities for circulation of air within the armature-space and between the sections of the field-coil at its partially-inclosed lower side, apertures in the bed-plate may be provided, as indicated in dotted lines in Fig. 3, between the bases of the cheek-pieces, so that more or less air may enter said armature-space, or leave it, by way of the open space beneath the bed-plate. It will be readily obvious that the ends of the field-coil divisions may be so curved or bent as to more or less overlap the ends of the cheek-pieces without departure from my invention, although the best results

will accrue if said coil ends be restricted so as to cover the ends of the armature.

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

1. In a dynamo-electric machine, the combination, substantially as hereinbefore described, of an armature having a core of magnetic metal, cheek-pieces which are connected at their bases in magnetic circuit and correspond in length with the length of the armature, and a field-coil which directly polarizes the armature, is partially inclosed at its lower side by the cheek-pieces at their bases, and has its upper side and its ends wholly exposed to the open air, whereby a completed magnetic circuit is afforded through the cheek-pieces and the armature and the field-coils freely exposed to cooling influences.

2. In a dynamo-electric machine, the combination, substantially as hereinbefore described, of an armature containing magnetic metal, cheek-pieces connected at their bases in magnetic circuit, and a field-coil which directly polarizes the armature, incloses portions of the cheek-pieces, and is itself uninclosed, except at its lower side, where it is located between the bases of said cheek-pieces.

3. In a dynamo-electric machine, the combination of a bed-plate having standards to support the bearings of the armature-shaft, a pair of concaved cheek-pieces bolted upon said bed-plate, and a field-coil located between said cheek-pieces and inclosing portions thereof and affording a space within said coil and between the cheeks for the reception of an armature.

4. In a dynamo-electric machine, the combination, substantially as hereinbefore described, of a pair of cheek-pieces connected in magnetic circuit at their bases and concaved at their ends to afford between them a space for the reception of an armature, and a field-coil interposed between said cheek-pieces, partially inclosing portions thereof, and also longitudinally surrounding the armature-space.

RUDOLF EICKEMEYER.

Witnesses:

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