

(No Model.)

E. P. WARNER & H. H. WAIT.
DYNAMO ELECTRIC MACHINE.

No. 587,379.

Patented Aug. 3, 1897.

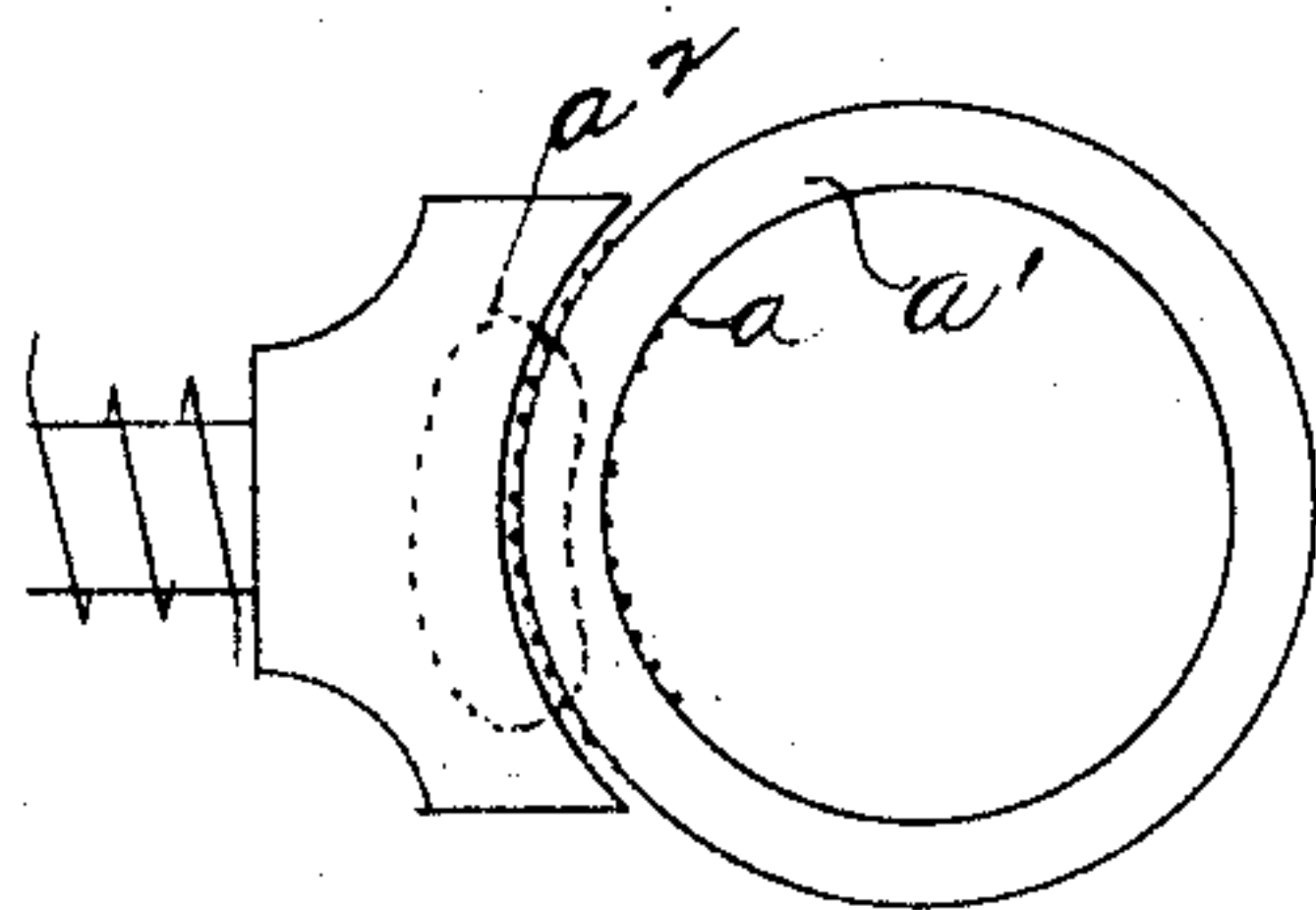


Fig. 1

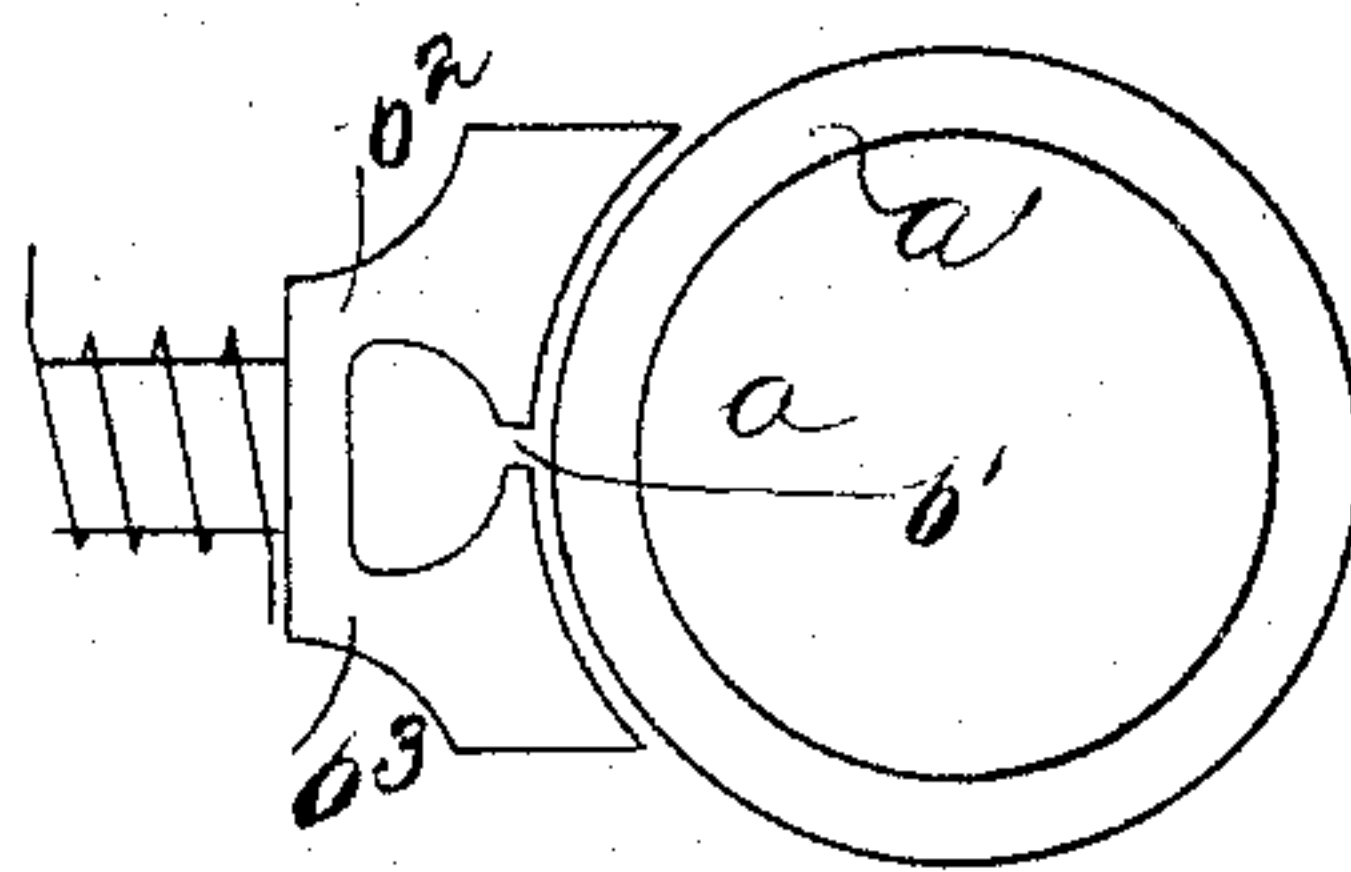


Fig. 2

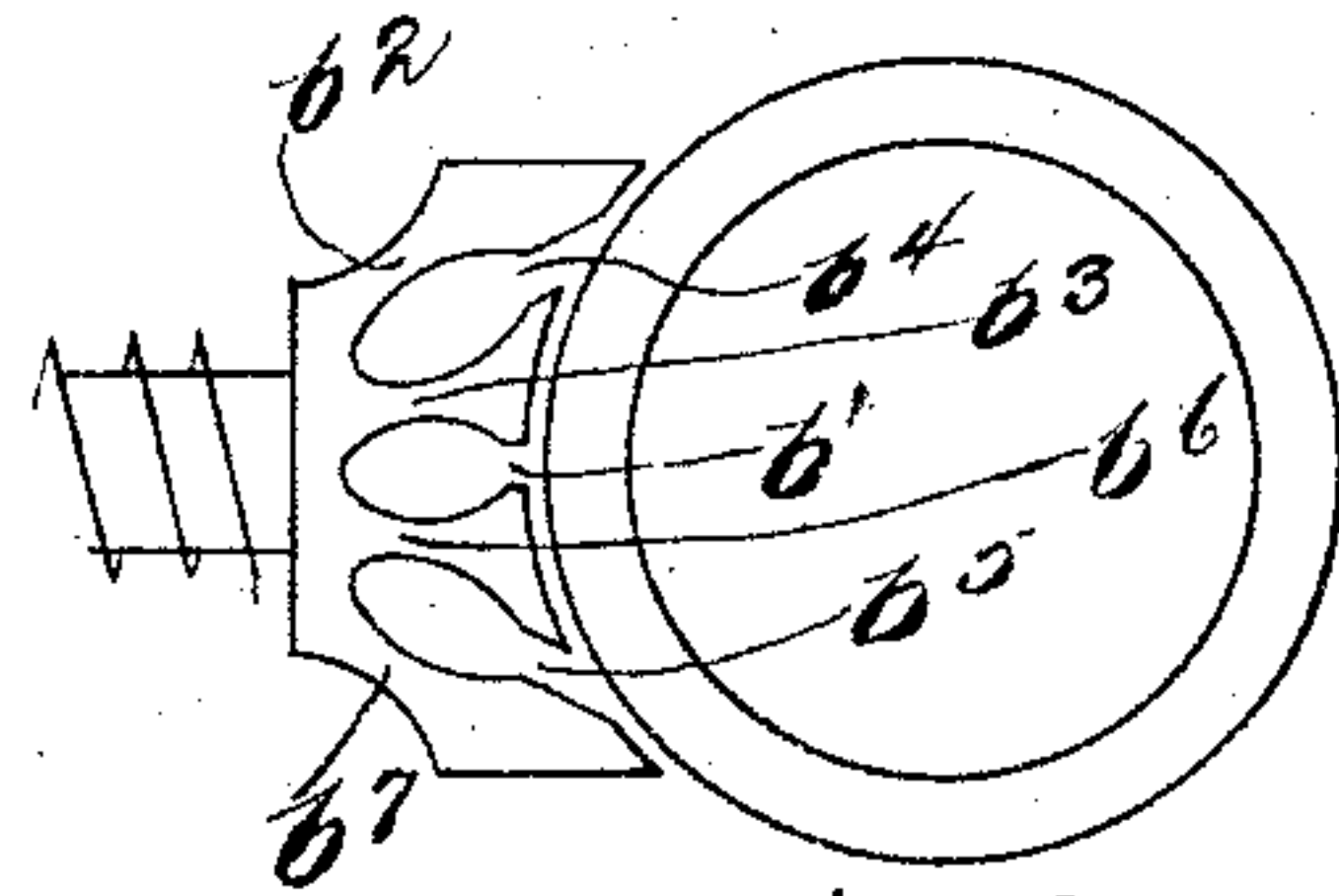


Fig. 3.

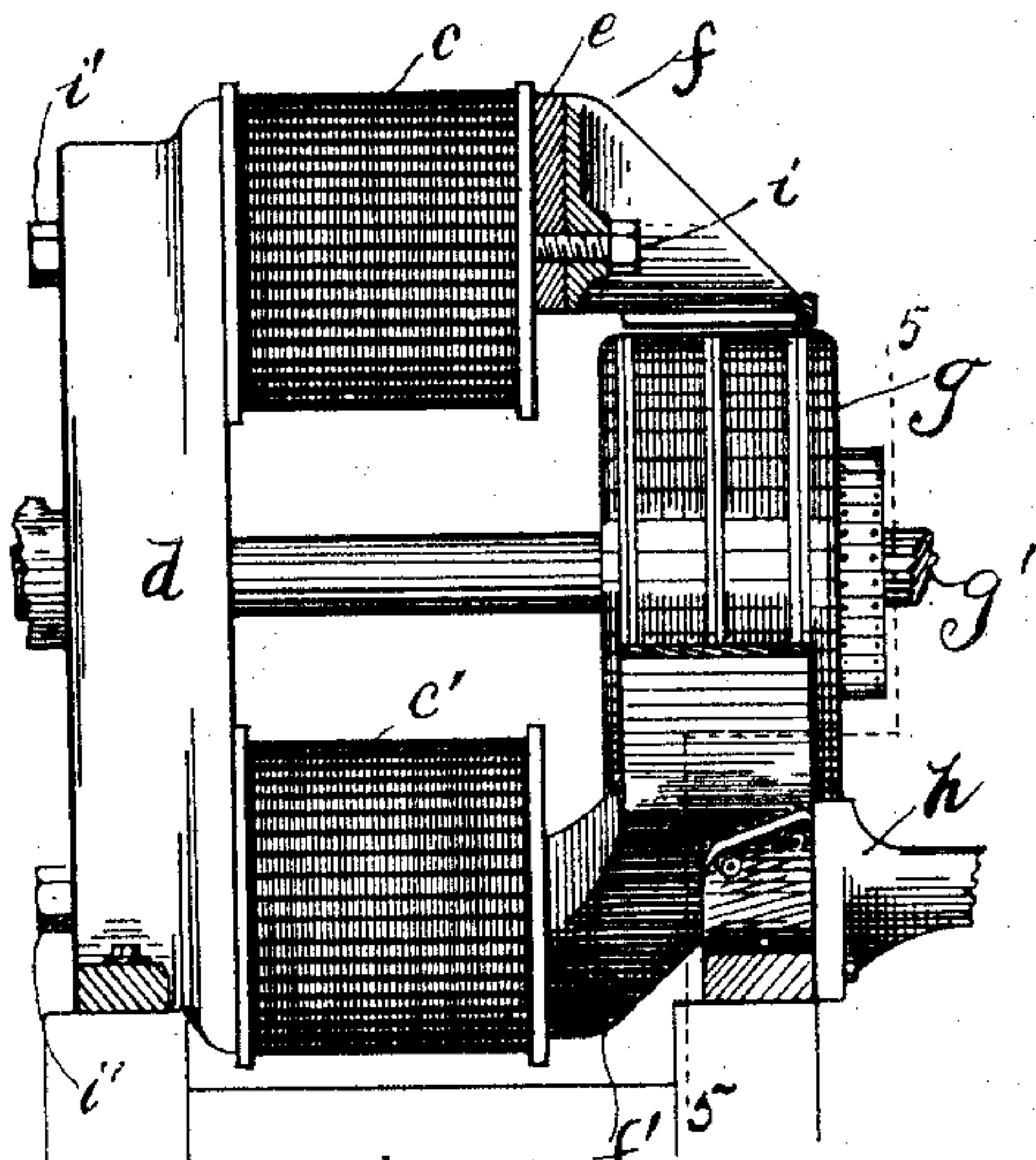


Fig. 4

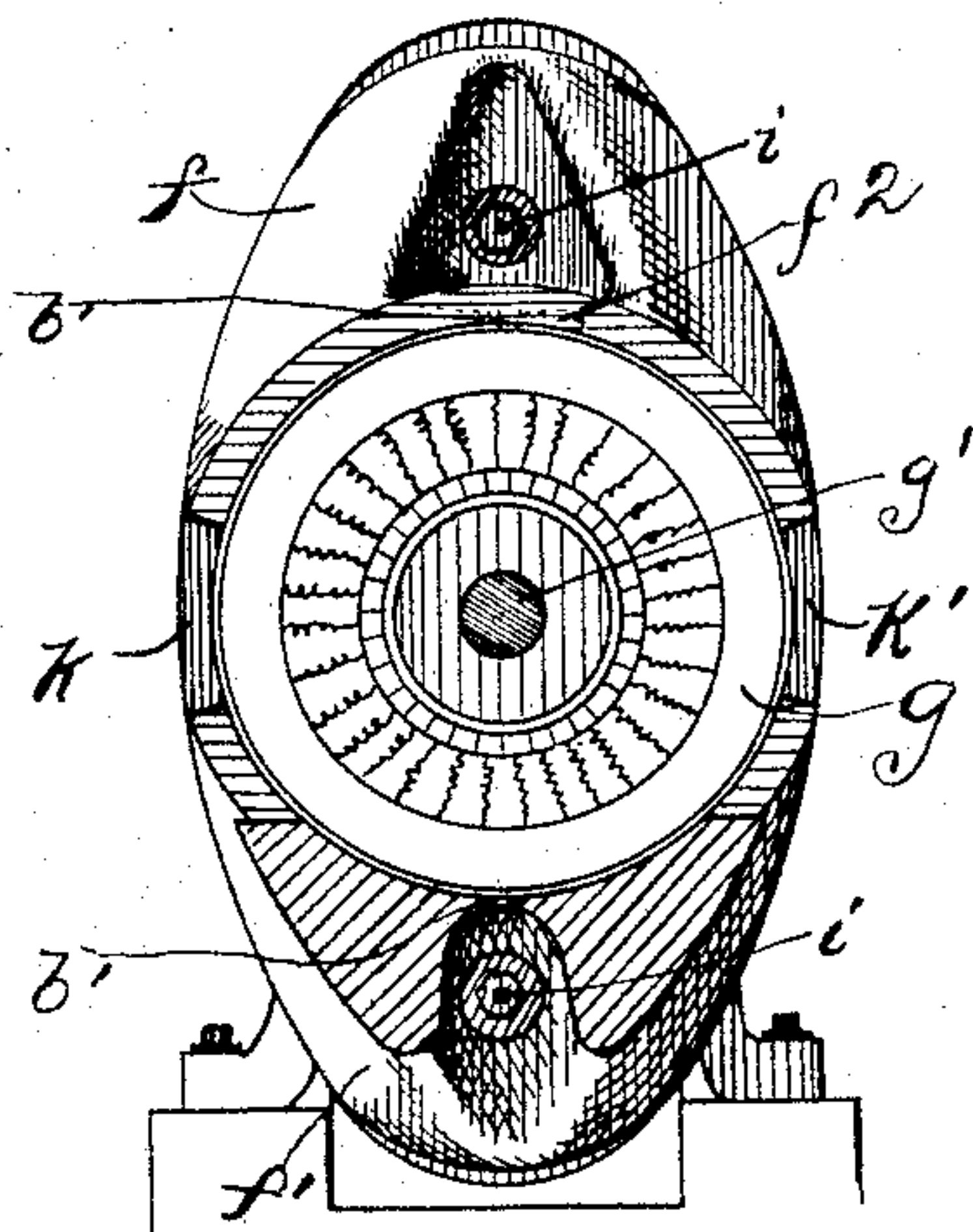


Fig. 5.

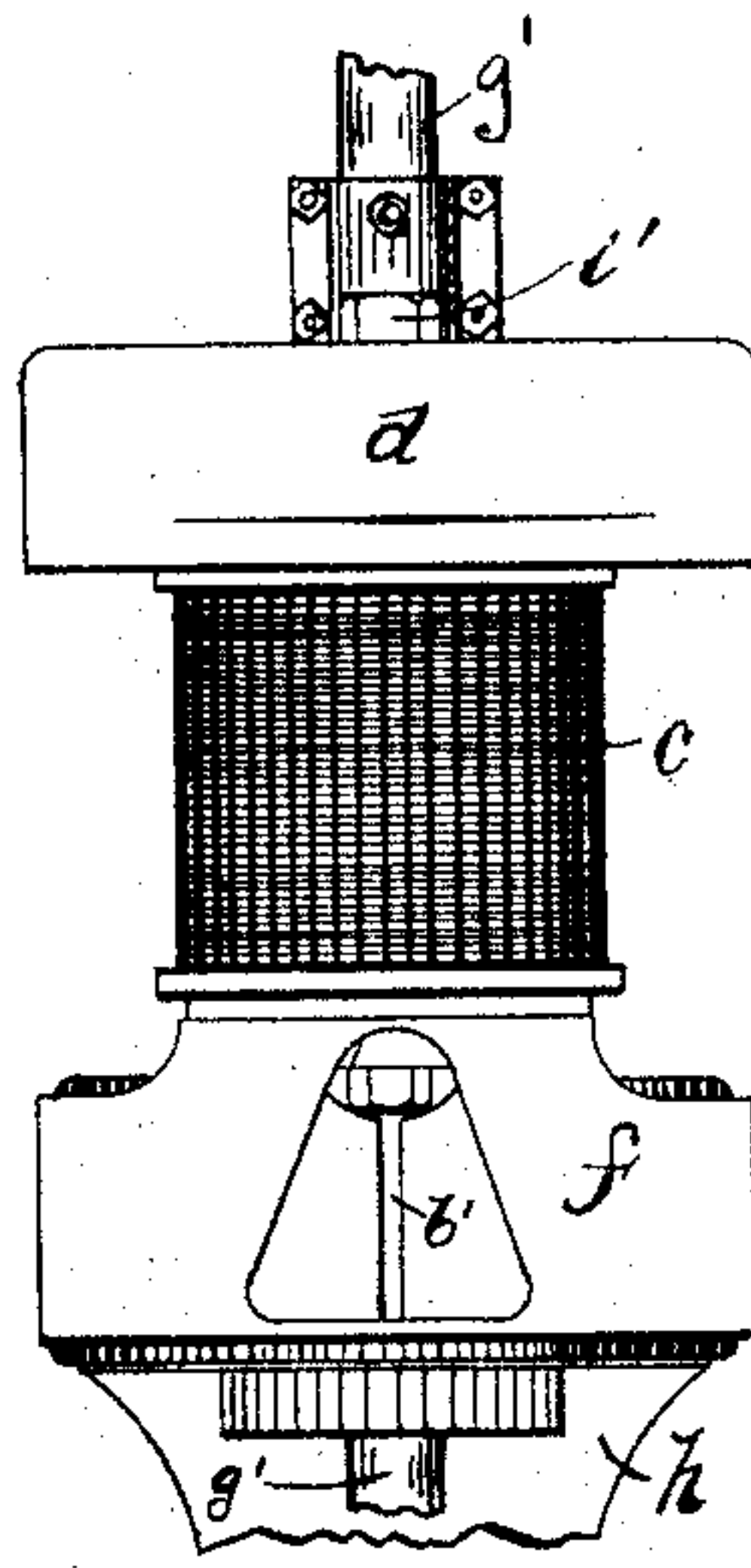


Fig. 6.

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UNITED STATES PATENT OFFICE.

ERNEST P. WARNER AND HENRY H. WAIT, OF CHICAGO, ILLINOIS, ASSIGNORS
TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 587,379, dated August 3, 1897.

Application filed June 3, 1896. Renewed January 20, 1897. Serial No. 619,973. (No model.)

To all whom it may concern:

Be it known that we, ERNEST P. WARNER and HENRY H. WAIT, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Dynamo-Electric Machines, (Case No. 60,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to a dynamo-electric machine; and its object is to prevent the formation of a local magnetic field through the pole-pieces, due to the magnetizing effect of the armature-coils.

In the operation of dynamo-electric machines as usually constructed a local magnetic field is produced in the pole-pieces by the armature-coils, the field passing from the armature-core across the air-space to the pole-piece, traversing a portion of the pole-piece and returning to the armature-core, thus threading the armature-coils that are for the instant opposite the pole-piece. This local field interferes with the proper regulation of the machine; and it is the object of our invention to so design the pole-pieces as to prevent the formation of the local magnetic field. For this purpose we provide a slot in the face of the pole-piece extending for a distance into the body thereof, the slot being so proportioned as to form constricted necks or paths, through which the lines of force produced by the field-coils must pass, the metal of the necks being brought to a point near saturation, whereby the production of a local magnetic field due to the armature-coils is prevented.

We will describe our invention more in particular by reference to the accompanying drawings, in which—

Figure 1 is a diagrammatic view illustrating the manner in which the field-poles have heretofore been constructed, the position of the local magnetic field being indicated by a dotted line. Fig. 2 is a diagrammatic view illustrating the pole-pieces constructed after the manner of our invention, whereby the production of a local magnetic field is prevented. Fig. 3 is a diagram showing the

pole-piece provided with a number of slots for accomplishing a similar result. Fig. 4 is a side view of a dynamo-electric machine embodying our invention. Fig. 5 is an end view thereof, partially in section, on line 5 5, Fig. 4. Fig. 6 is a plan view of the machine.

Like letters refer to like parts in the several figures.

As illustrated in Fig. 1, due to the armature-coils a on the armature-core a' , a local magnetic field is produced, threading the armature-coils which are in front of the pole-piece and passing through the body of the pole-piece, as indicated by the dotted line a^2 . It is the object of our invention to prevent the formation of this local magnetic field; and to accomplish this object we provide a slot b' in the pole-piece, the slot being widened at the rear to leave two constricted paths $b^2 b^3$, through which the lines of force produced by the field-coils c must pass in passing to the armature. The cross-sections of the paths $b^2 b^3$ are proportioned so that the metal thereof is brought to a point near saturation during the normal operation of the machine, thus choking back or preventing the passage of the lines of force induced by the coils a and which tend to find circuit through the metal of the pole-pieces.

In Fig. 3 we have illustrated a pole-piece provided with three slots $b' b^4 b^5$, narrow at the face of the pole-piece and of increased width at the interior of the pole-piece, four constricted necks or paths $b^2 b^3 b^6 b^7$ being thus provided.

In Figs. 4, 5, and 6 we have illustrated a machine embodying our invention as employed in practice, the machine comprising a standard d , carrying at the top and bottom core-pieces for the field-coils $c c'$. Upon the ends of the core-pieces are mounted the pole-pieces $f f'$, between which rotates the armature g , mounted upon the shaft g' , one end of which is journaled in a standard h , (a portion of which is broken away in Figs. 4 and 6,) the other end of the shaft g' being journaled in a bearing mounted upon the standard d . The pole-pieces $f f'$ are hollowed or cut away at the middle to leave a thin shell f^2 at the face of the pole-piece. A slot b' is provided extending through the shell f^2 , as illustrated,

the slot being enlarged at the rear to thus form constricted necks or paths joining the pole-pieces with the cores upon which the field-coils are mounted. The lines of force of the field produced by the coils $c c'$ are thus caused to traverse the constricted necks or paths thus formed in passing to the armature, and in consequence the metal of said necks is brought to a point near saturation, thus preventing the formation of a local magnetic field through the pole-pieces, due to the armature-coils that may for the time being rest in front of the pole-pieces.

Bolts i extend through the pole-pieces $f f'$ into the cores $e e'$, thus securing the pole-pieces and the cores together. Bolts i' extend through the standard d into the cores, thus securing the cores to the standard. Between the edges of the pole-pieces we provide distance-pieces $k k'$, of non-magnetic material, which serve to support the weight of the upper pole-piece.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a dynamo-electric machine, the combination with an armature, of a pole-piece cut away or slotted to leave constricted necks or paths for the passage of the main field-lines of force, said necks or paths being so proportioned that the metal thereof will rise to a point near saturation during the normal operation of the machine to prevent the formation of a local field through the pole-pieces due to the armature-coils; substantially as described.

2. In a dynamo-electric machine, the combination with cores carrying the field-coils, the pole-pieces connected therewith by two

or more constricted necks or paths, said necks or paths being proportioned to carry the necessary lines of force of the main field when at practical saturation-point to thereby prevent the passage of lines of force due to the armature-coils; substantially as described.

3. In a dynamo-electric machine, the combination with a pole-piece, provided with a slot or slots, narrow at the pole-face and of increased width at portions removed from the face of the pole-piece, to thus leave constricted necks or paths between the face of the pole-piece and the remaining portions of the field-magnet circuit to prevent the formation of a local magnetic field; substantially as described.

4. In a dynamo-electric machine, the combination with a standard, of cores for the field-magnet coils mounted thereon and perpendicular thereto, pole-pieces mounted upon the ends of said cores, and extended toward one another to surround the armature, said pole-pieces being hollowed or cut away at the middle to leave a thin shell at the face of the pole-pieces, a slot extending from the front to the rear of said shell, said slot being of increased width at the rear to form two constricted necks or paths joining the face of the pole-piece with the core, upon which the field-magnet coil is mounted; substantially as described.

In witness whereof we hereunto subscribe our names this 20th day of May, A. D. 1895.

ERNEST P. WARNER.
HENRY H. WAIT.

Witnesses:

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W. CLYDE JONES.