

No. 879,949.

PATENTED FEB. 25, 1908.

G. DUNN.

COIL RETAINER FOR DYNAMO ELECTRIC MACHINES.

APPLICATION FILED JUNE 3, 1907.

Fig. 1.

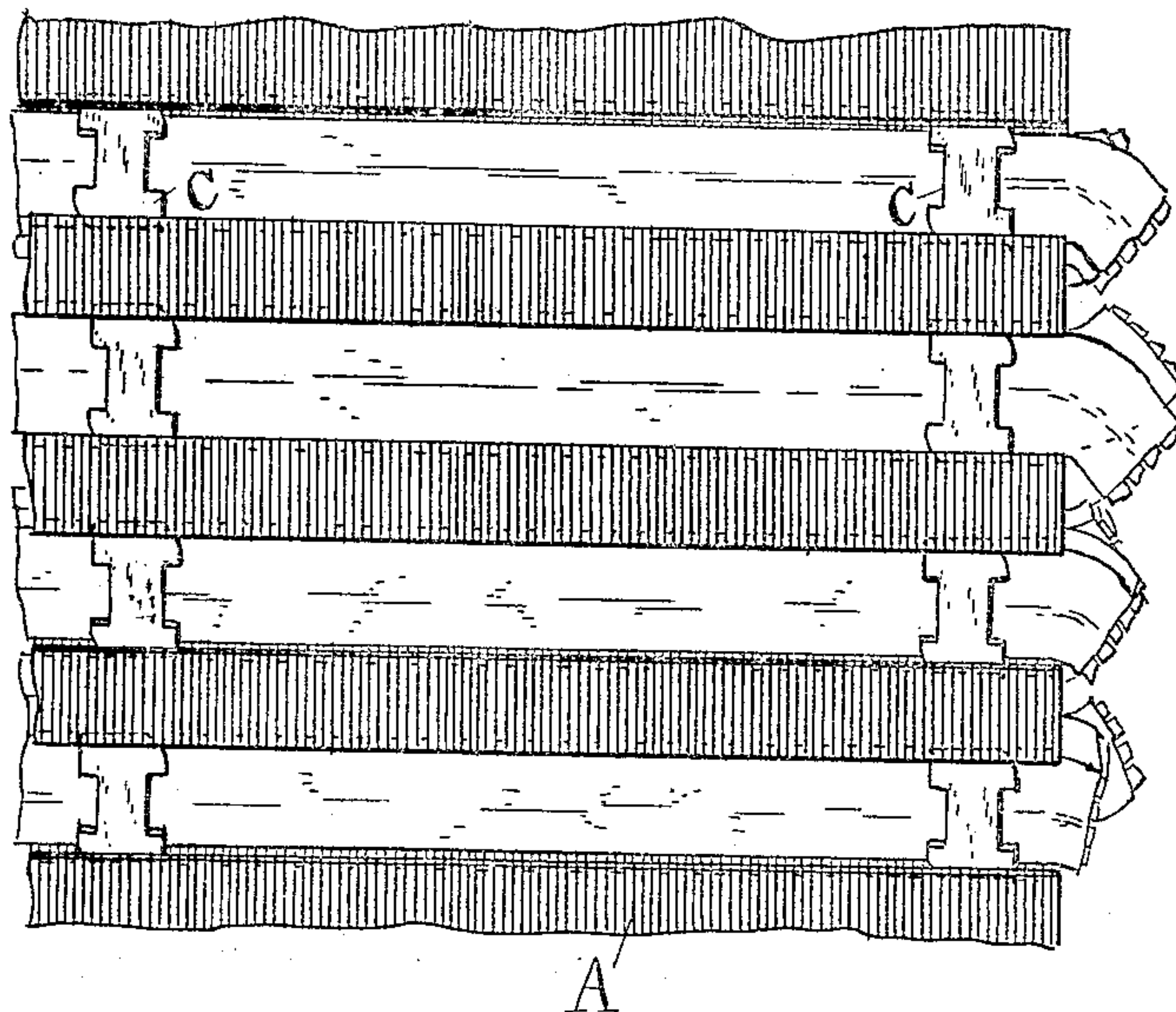


Fig. 2.

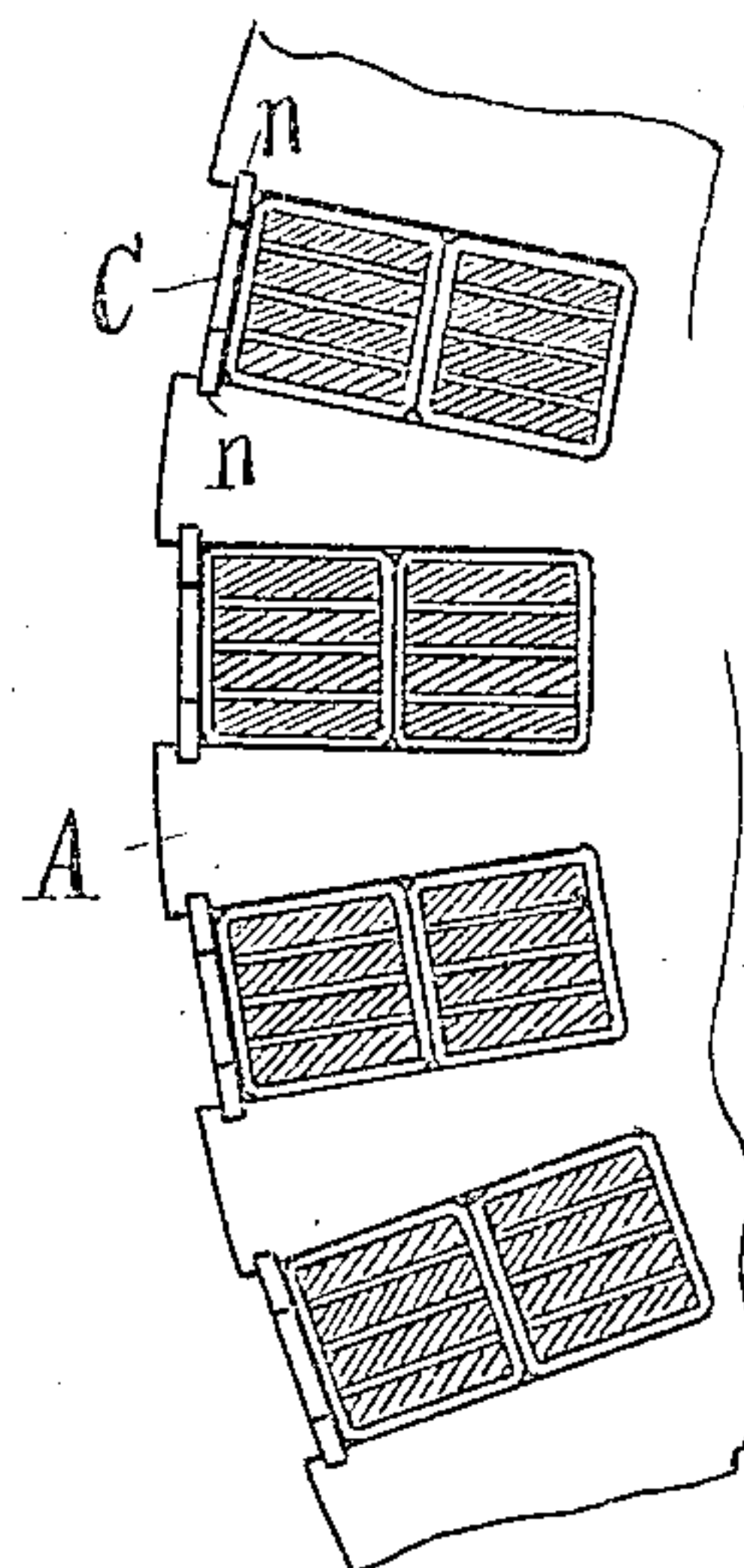


Fig. 3.

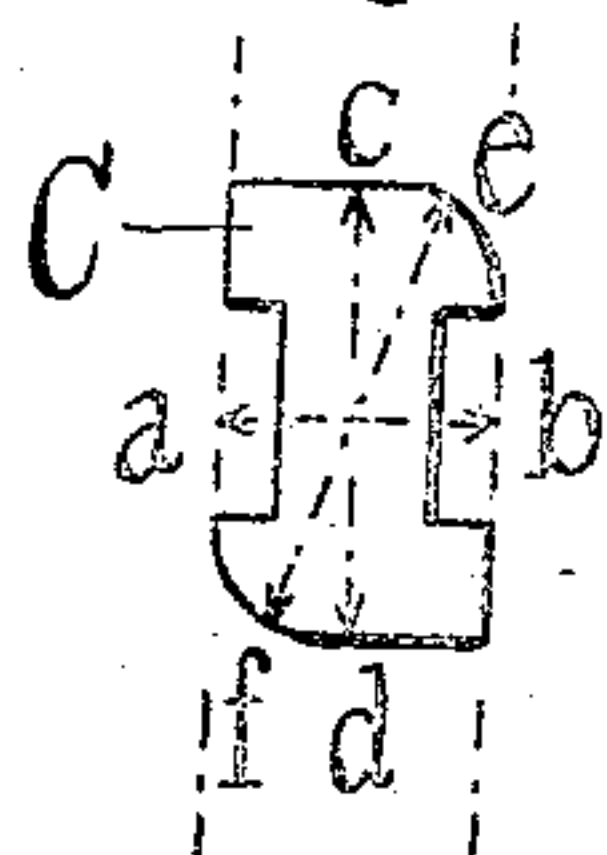


Fig. 4.

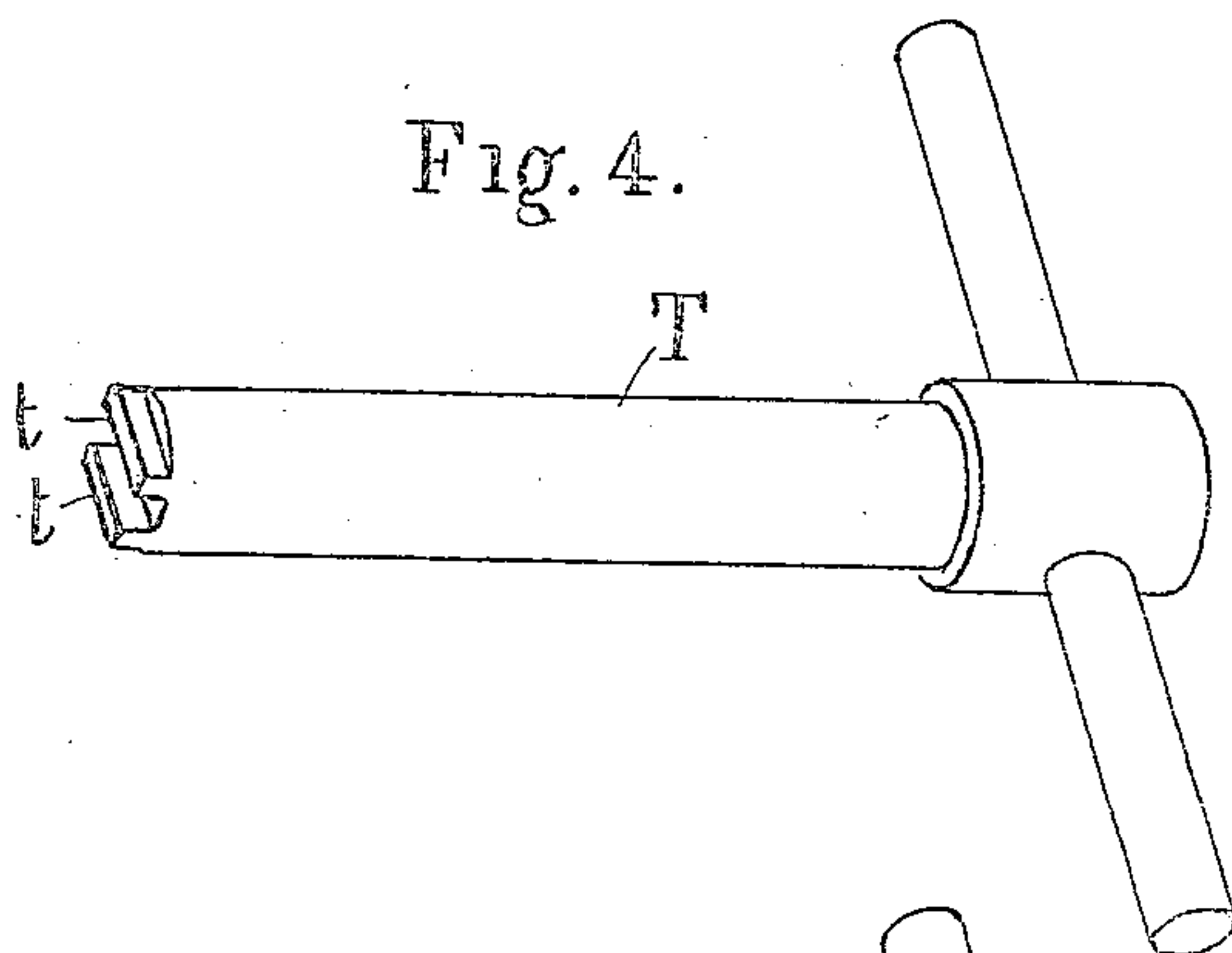
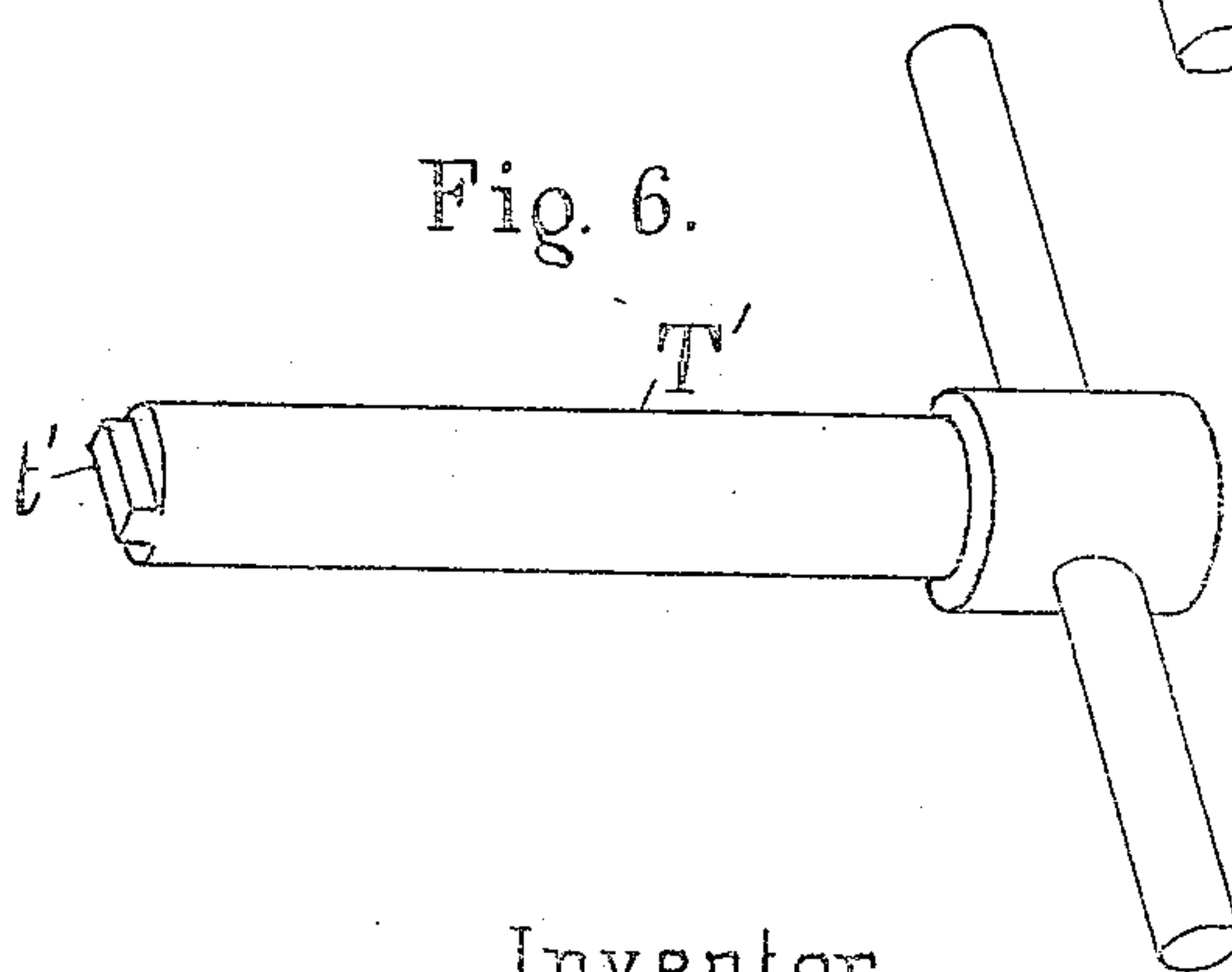


Fig. 5.



Fig. 6.



Witnesses:

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UNITED STATES PATENT OFFICE.

GANO DUNN, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO CROCKER-WHEELER COMPANY,
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COIL-RETAINER FOR DYNAMO-ELECTRIC MACHINES.

No. 879,949.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed June 3, 1907. Serial No. 376,992.

To all whom it may concern:

Be it known that I, GANO DUNN, a citizen of the United States of America, and a resident of East Orange, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Coil-Retainers for Dynamo-Electric Machines, of which the following is a specification.

The object of this invention is to provide a device for securing the coils or windings in the slots of dynamo-electric machine elements, the devices being of simple construction and inexpensive material, easy of application irrespective of the length of the slots, and reliable, so formed that they will not increase the self-induction of the windings, will have negligible magnetic losses, will be free from eddy currents of moment, and will not obstruct the heat radiation.

In the accompanying sheet of drawings which forms a part of this application, Figure 1 shows a portion of the face of an armature with a slotted core in which windings are shown in one of the slots and locked with coil-retainers embodying my invention. Fig. 2 shows a portion of the end of the armature with the coil-retainers in edge view and the locked windings in section. Fig. 3 shows one form of such coil-retainer with narrow middle section drawn to larger scale. Fig. 4 shows a perspective view of a tool suitable for applying this form of coil-retainer. Fig. 5 shows another form of coil-retainer constructed to be locked by a tool with a screw-driver end. Fig. 6 is a perspective view of a tool suitable for applying the form of coil-retainer of Fig. 5.

The invention is illustrated in connection with an armature, the core of which consists of circular iron punchings A with peripheral slots as shown. When these punchings are laid together in sufficient numbers the slots formed thereby have considerable length and in these slots the customary windings W are laid. In the side walls of each slot and near the mouth are notches *n n* into which the coil-retainers C C lock. These coil-retainers are conveniently punched from sheet metal. Metal is preferable to any vegetable fiber, because of the shallow space required above the windings for a retainer of sufficient strength. Metal is preferable, also, because of permanency of form, there being no shrinking or loosening through drying, and it is less of an ob-

struction to the conduction and radiation of heat from the windings. Of the metals, iron or brass is usually to be preferred. Iron is the least expensive and it has greater strength and electrical resistivity, while brass, for example, avoids a slight increase in self-inductance which would be caused by iron. German silver, zinc and other metals may be substituted with some advantages both as to dia-magnetism and electrical resistivity.

The invention is not to be regarded as limited to any particular form, provided that it is constructed for insertion into the slot from the face instead of being slid in from the end, and is brought into engagement by a tool which acts on the coil-retainer, preferably in a rotative manner, to bring it into locking engagement with the notches in the slot walls. Two forms are illustrated, a form C with a narrow middle section and enlarged ends in Fig. 3, and a form C' like a frame with two diagonal corners rounded and a rectangular central opening, suited for engagement by a square ended tool or screw-driver. The form of Fig. 3 affords less opportunity for circulatory currents, and is on this account to be preferred. It is set in place by a tool T with double tongues *t t* which engage either side of the narrow middle section. The outside dimension as taken on the axis *a—b* between inclosing parallel lines is less than the width of the slot, and the outside dimension as taken on the axis *c—d* is equal to the distance apart of the bottoms of opposing notches in the slot walls. On the axis *e—f* which lies intermediate of the other two axes, the two diagonal corners of the coil-retainer are rounded so as to leave this dimension preferably slightly in excess of the distance between the bottoms of the notches so that the spring of the material of the armature core and of the coil-retainer will allow these corners to pass the bottoms of the notches in revolving the coil-retainer, but such excess along this axis is not essential. The other two diagonal corners are not rounded and prevent further rotation of the retainer after the axis *c—d* has been brought directly across the slot. A number of coil-retainers are usually required in each slot at spaces generally from two to six inches according to the weight and character of the windings, centrifugal force, width of the

slot, and bending moment of the coil-retain-
ers. The slot insulation may be turned
down and folded over the windings prior to
the pressing down and engaging of the coil-
5 retainers, in which case the notches will be
clear, or the coil-retainers may be inserted
between the walls of the slot insulation, in
which case the coil-retainers readily cut
through the walls to engage the notches.
10 Insulation may be slipped under the coil-
retainers if the wrapping of the windings is
not sufficient. Varnish applied to the sur-
face after the element is otherwise com-
pleted impedes accidental unlocking of the
15 coil-retainers.

The use of the coil-retainers according to
this invention is not limited to the revolving
elements or armatures of direct current
machines, nor to elements which have the
20 slots for the windings in their convex faces.

What I claim as new and desire to secure
by Letters Patent of the United States is:

1. The combination of a slotted dynamo-
electric machine element, windings located
25 in the slot, and a coil-retainer constructed
to admit of passage into the slot from the
face of the element, and for locking into the
walls of the slot by rotation, substantially as
described.

2. The combination of a slotted dynamo- 30
electric machine element, the walls of the
slots near their mouths being notched, wind-
ings located in the slots, and a coil-retainer
with a middle section shaped for engage- 35
ment with a suitable key, the outside di-
mension along one axis being less than the
width of the slot, and the outside dimension
along another axis being equal to the dis-
tance apart of the bottoms of opposing
notches, substantially as described. 40

3. The combination of a slotted dynamo-
electric machine element, the walls of the
slots near their mouths being notched, wind-
ings located in the slots, and a coil-retainer 45
having a narrow middle section and enlarged
ends, with the middle section shaped for en-
gagement with a suitable key, the outside
dimension along one axis being less than the
width of the slot, and the outside dimension
along another axis being equal to the dis- 50
tance apart of the bottoms of opposing
notches, substantially as described.

Signed by me at Ampere, New Jersey, this
31st day of May, 1907.

GANO DUNN.

Witnesses:

HENRY J. FULLER,
H. C. HARRISON.