ALBERT SCHMID, OF ALLEGHENY, AND NIKOLA TESLA, OF PITTSBURG,
ASSIGNEES TO THE WESTINGHOUSE ELECTRIC COMPANY, OF PITTS-
BURG, PENNSYLVANIA.

ARMATURE FOR ELECTRIC MACHINES.

Application filed June 26, 1889. Serial No. 815,937. (No model.)

To all whom it may concern:

Be it known that we, ALBERT SCHMID and NIKOLA TESLA, citizens, respectively, of the
Republic of Switzerland and Smiljan, Lika, border country of Austria-Hungary, now resid-
ing in Allegheny and Pittsburg, both in the county of Allegheny and State of Penn-
sylvania, have invented a certain new and useful Improvement in Armatures for Electric
Machines, (Case No. 310,) of which the follow-
ing is a specification.

The invention relates to the construction of armatures for electric generators and motors,
and the object is to provide an electrically-efficient armature, the construction of which
is simple and economical, and in which the coils of insulated conducting wire or ribbon
may be conveniently wound or formed into bobbins so located with reference to the body
of the armature as to afford as good results as possible.

For certain purposes it is desirable to con-
struct the armatures of electric generators and
motors with their cores of magnetizable mate-
rial projecting through the coils into close
proximity to the field-magnet poles. When
armatures are constructed in this manner,
some means are necessary for holding the coils
in position and preventing them from being
thrown out by centrifugal force.

This invention aims to provide such means
in an armature having polar projections, and
also to form an armature in such manner as
to expose a large area of core-surface to the
field-magnet poles.

The invention consists, in general terms, in
forming an armature-core which is preferably
built up of laminae of magnetizable material
insulated from each other, with diverging
slots or openings for receiving the armature
wire or ribbon, which slots are connected with
the exterior of the armature by openings
through which the wire may be laid in the
slots, and in placing the wire in such slots in
the proper manner.

We are aware of the United States Patents
No. 327,797, granted to Innisich, and No.
292,077, granted to Wenstrom, and the British
patent of Coepeer, No. 9,018 of 1887, and do
not claim the constructions shown and de-
scribed therein.

The invention will be described more par-
ticularly in connection with the accompany-
ing drawings, in which—

Figure 1 is an end view, partly in section, of
an armature embodying the features of the in-
vention, and Fig. 2 is a plan of the armature.

Referring to the figures, F F indicate field-
magnet poles, and A represents the body or
core of an armature composed, in this in-
stance, of laminae of magnetizable material
built up in any suitable manner, the laminae
being preferably separated by intervening
strata of insulating material. The individual
plates or laminae are constructed with radial
openings c, extending a short distance from
the surface, and with slots or openings b, which
extend in different directions from the open-
ings c. The slots diverge from each other at
such angles as to cause the two slots upon the
opposite sides of each web e thus formed to lie
in the same chord of the circle of the arma-
ture. The plates may also be stamped or formed with openings G to remove the un-
necessary metal. After the plates are formed
they are laid up in the proper manner to form
the entire armature-core, the slots b being
placed opposite each other to form continuous
openings through the entire length of the
armature. These openings may be lined by
pockets h of insulating material—such, for
instance, as vulcanized fiber—and the wires
are then wound into the slots from the open-
ings c and around the respective webs e.

Winding-clips k may be placed at the respect-
ive ends of the armature opposite each web e
to hold the wires in the proper positions as
they are wound in the slots and down upon
the armature ends.

The wires having been wound into their
proper positions, they may be held more se-
curely in position by means of blocks K of
non-magnetic material, placed at intervals or
extending through the entire slots or open-
ings c and projecting into the slots b.

An armature constructed in the manner
described is found to be very efficient in its operations and at the same time simple in its construction.

The connections between the armature-coils and the conductors or collecting-plates may be made in any usual well-known manner, according to the purposes desired to be served.

We claim as our invention—

1. A core for electrical machines, composed of plates of magnetizable material separated by insulation, said plates having diverging slots for receiving the armature-conductors and an opening to the exterior of the plate at the origin of the diverging slots.

2. A core-plate for electrical machines, stamped with diverging slots at intervals near its periphery and an opening to the periphery at the angle formed by each two diverging slots.

3. A core for electrical machines, composed of plates of magnetizable material separated by insulation, said plates having diverging slots for receiving the armature-conductors and an opening to the exterior of the plate at the origin of the diverging slots, the width of such openings being approximately equal to the width of the slot.

4. An armature-core for electric machines, consisting of plates of magnetizable material separated by insulation, having radial openings at intervals, slots diverging from said openings for receiving armature-coils, and winding blocks or clips at the ends of the core.

5. An armature-core for electrical apparatus, composed of plates of magnetizable ma-

terial separated by insulation and having radial openings at intervals, slots extending in opposite directions from said openings for receiving wires, and insulating-linings for said slots.

6. An armature for electric machines, consisting of a laminated core formed with diverging slots for receiving the wires, said slots leaving intervening webs, and coils of wire wound in said slots.

7. An armature for electric machines, consisting of a laminated core formed with diverging slots for receiving the wires, said slots leaving intervening webs, coils of wire wound in said slots, and non-magnetizable material closing the openings of the adjacent slots outside the wires, substantially as described.

8. An armature for electric machines, consisting of a core having its outer surface continuous except for narrow longitudinal openings at intervals and having slots diverging from said openings, armature-coils wound in said slots, and blocks or strips of non-magnetizable material closing the openings and forming with the metal of the armature a practically continuous surface.

In testimony whereof we have hereunto subscribed our names this 25th day of June, A. D. 1889.

ALBERT SCHMID.

NIKOLA TESLA.

Witnesses:

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ARMATURE FOR ELECTRIC MACHINES.

Fig. 2.

Witnesses
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By their Attorney
Charles A. Tiffany