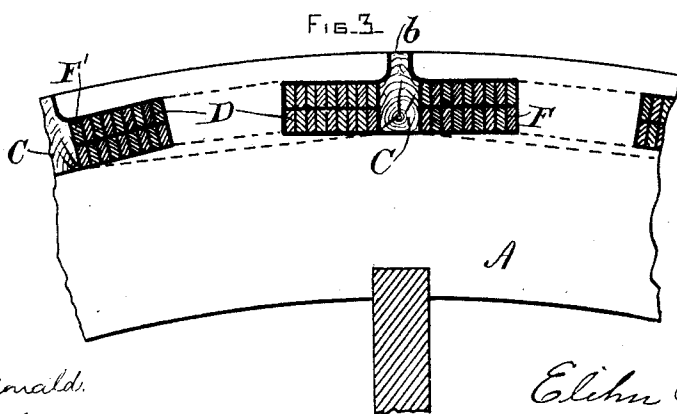
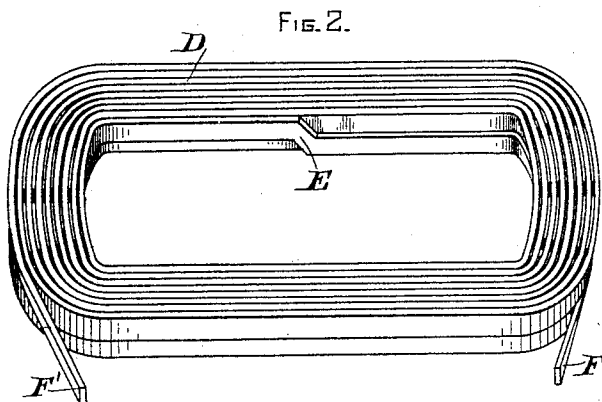
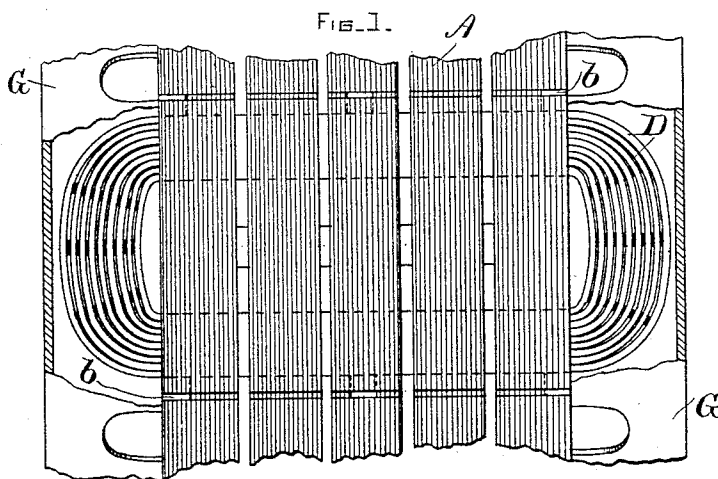


(No Model.)

E. THOMSON.
ARMATURE WINDING.

No. 516,848.

Patented Mar. 20, 1894.



WITNESSES.

W. G. MacDonald,
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INVENTOR -

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Atty

UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF SWAMPSCOTT, MASSACHUSETTS, ASSIGNOR TO THE
GENERAL ELECTRIC COMPANY, OF NEW YORK.

ARMATURE-WINDING.

SPECIFICATION forming part of Letters Patent No. 516,848, dated March 20, 1894.

Application filed November 16, 1892. Serial No. 452,140. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, residing at Swampscott, county of Essex, State of Massachusetts, have invented a certain new and useful Improvement in Armature-Windings, of which the following is a specification.

My present invention comprises an armature and coil of peculiar construction. It is desirable to have such coils compact, and to have both ends of the coil terminate at the external part of the coil, which by previous methods has been difficult, since it is necessary to give the turns a common direction from end to end, and in a plain coil this brings one end on the inside and the other on the outside of the coil. In my invention the coil is wound in two halves or portions starting at or near the center, each half being wound outwardly from the center to the end, and in opposite directions from the center taken as a common starting point, though of course the direction of the turns from end to end of the coil is the same. At the center a bend is made so that the upper portion is wound over the under portion. The coil thus formed is of course electrically continuous but mechanically it may be considered as divided into portions, each portion comprising approximately one half of the entire wire and terminating in one of the coil ends while the sections themselves are superimposed one upon the other. In this manner the ends of the coils are brought to convenient points for attachment to the terminals of other coils, to collector rings, or to a commutator as may be desired.

In the accompanying drawings Figure 1 is a top view of a portion of an armature sufficient to illustrate the invention. Fig. 2 is a view in perspective of one of the coils, and Fig. 3 is a sectional view through the core of a portion of the armature.

A represents an armature core of the preferred pattern. As seen in Fig. 1, it is made up of a number of ring sections laminated and spaced apart in the customary manner. The armature is provided with internal chambers to which entrance is had through comparatively narrow surface openings *b*, and the wire is wound through one of these open-

ings and back through the next, so as to form coils such as are seen in Fig. 3, which may be held in place by wedges *C* or by other means, that being a feature which has nothing to do with my invention. The coil itself, *D*, is made up of wire or ribbon of any suitable material, and the winding of it is commenced first at or near the center where there is an upward bend *E*, seen in Fig. 2. Starting from this bend the lower portion of the coil is wound into the desired number of turns which surround one another circumferentially and terminate in the end *F*. The bend *E* is long enough to bring the wire up just above the portion thus wound, and the remaining half is then wound from the center outwardly, forming an upper half superimposed on and similar to the lower half and terminating in the other end *F'* of the coil.

In Fig. 2 the bend is shown for convenience midway of the long side of the coil. It may be located anywhere, but in practice it will preferably be midway of the short end of the coil, so that the ends may be led off to the sides of the armature without making one half of the winding longer than the other. When the coils have been wound in place around the polar projections of the armature, a casing *G* of insulating material, or at any rate of material safely insulated from the coil *D*, may be used as a protection. Of course with armatures constructed differently from that shown in the drawings the coil may be wound up separately in the manner described and applied to the armature as a whole. This has, however, proved a specially convenient form of winding for the armature shown, where a compact flat coil is desired, and where the coil must be wound in place upon the armature.

What I claim as new, and desire to secure by Letters Patent, is—

1. An armature having under cut or broadened coil chambers to which entrance is had through comparatively narrow openings in the surface of the armature, and coils surrounding the projections between such recesses, each wound in two layers having the ends of the coil at the external part of such layers, respectively.

2. An armature coil having under-cut or

broadened coil chambers to which entrance
is had through comparatively narrow open-
ings in the surface of the armature, and the
spaces between such chambers forming teeth
5 for the reception of the coils, and an arma-
ture coil or winding upon each tooth formed
of a single piece of wire or ribbon having a
bend E at or near its center, and portions
superimposed upon one another, as shown,
10 each consisting of a number of turns wound

circumferentially in the same plane and each
terminating in one of the ends, substantially
as described.

In witness whereof I have hereto set my
hand this 12th day of November, 1892.

ELIHU THOMSON.

Witnesses:

JOHN W. GIBBONEY,
BENJAMIN B. HULL.