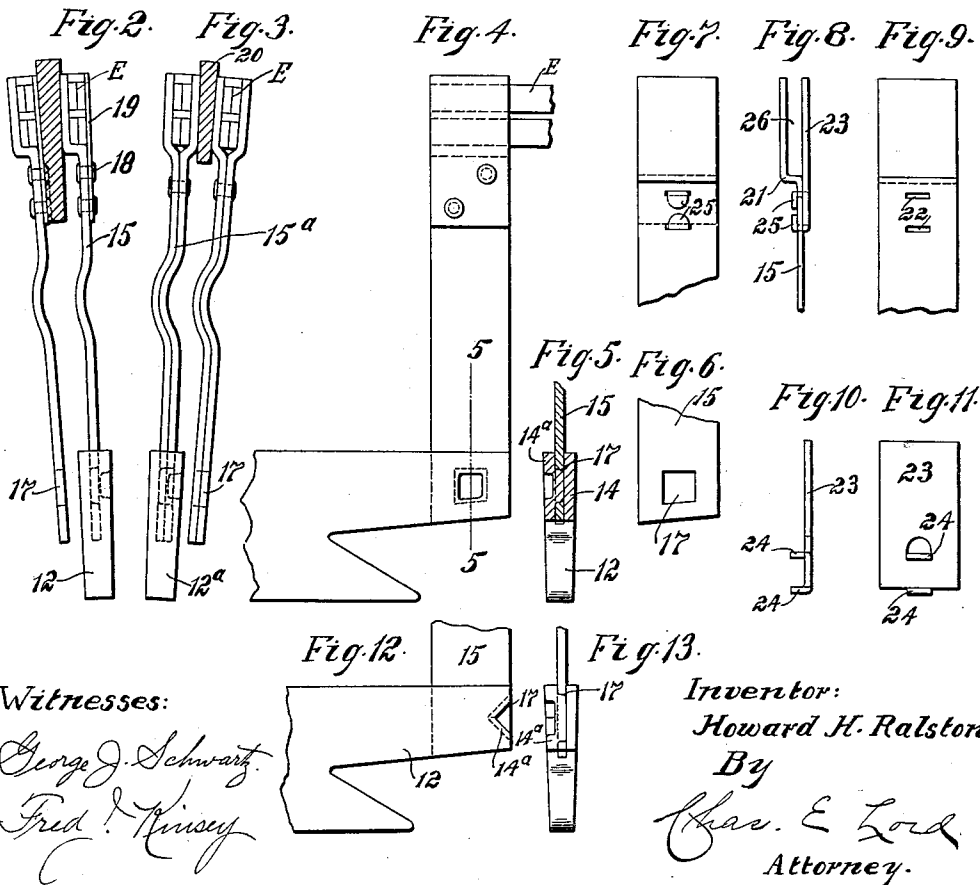
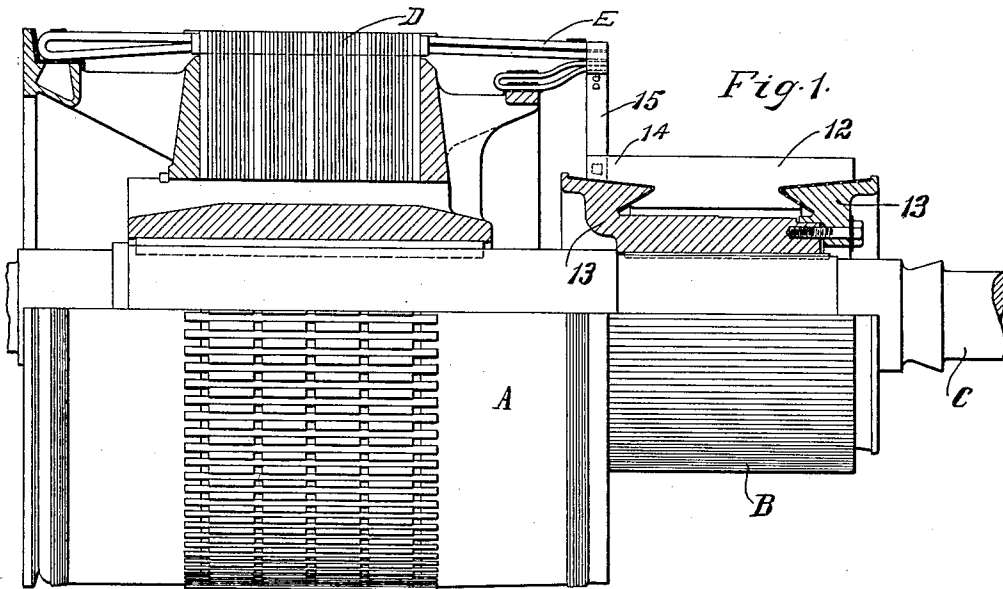


H. H. RALSTON.
DYNAMO ELECTRIC MACHINE.
APPLICATION FILED JAN. 27, 1905.

1,028,965.

Patented June 11, 1912.



UNITED STATES PATENT OFFICE.

HOWARD H. RALSTON, OF NORWOOD, OHIO, ASSIGNOR TO THE BULLOCK ELECTRIC MANUFACTURING COMPANY, A CORPORATION OF OHIO.

DYNAMO-ELECTRIC MACHINE.

1,028,965.

Specification of Letters Patent.

Patented June 11, 1912.

Application filed January 27, 1905. Serial No. 242,822.

To all whom it may concern:

Be it known that I, HOWARD H. RALSTON, citizen of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is a full, clear, and exact specification.

My invention relates to dynamo electric machines and especially to the construction and arrangement of the commutators of said machines and the connections between the commutator segments and the armature coils. It is essential in making the connections between the commutator segments and the armature coils to secure perfect electrical contact and a considerable degree of mechanical strength.

The object of my invention is therefore to simplify the method of making these connections and to minimize the liability of the commutator segment and connections pulling apart during the operation of the machine.

The invention in one of its aspects, comprises the method of fastening a commutator connector to a commutator segment, said method consisting of slotting one end of the commutator segment, and then placing in the slot thus formed a connector with an opening or cut-away portion therein, and then forcing into the opening of said connector part of the metal of the segment adjacent to said opening.

In another aspect my invention comprises the combination with a commutator segment having one end slotted, of a commutator connector in the slot in said segment, said connector having an opening or cut-away portion and part of the metal of the segment adjacent to the opening or cut-away portion of said connector being forced into said opening after the parts are assembled.

My invention still further consists in the details of construction and in the combinations of elements described in the specification and set forth in the appended claims.

In the accompanying drawings, which illustrate the preferred embodiment of my invention, Figure 1 is an elevation partially in section of an armature equipped with my invention; Fig. 2 is an end view of a pair of commutator connectors one of which is attached to a commutator segment in accordance with my invention; Fig. 3 is a

view similar to Fig. 2, showing a slightly different form of commutator connector; Fig. 4 is a side elevation of a part of the commutator segment and its connector; Fig. 5 is a sectional elevation on line 5—5 of Fig. 4; Fig. 6 is a side view of the inner end of the commutator connector, showing the preferred shape of the opening in said connector; Figs. 7 and 8 are side and end views respectively of the outer end of commutator connector, showing the preferred means for connecting said commutator connector to the armature coils; Figs. 9, 10, and 11 are views of the outer part of the commutator connector dismantled; and Figs. 12 and 13 are side and end elevations respectively of a modified form of connection between commutator segment and connector.

Referring now to the figures of the drawings, the armature A is provided with a laminated core D and armature coils E connected to the segments of commutator B mounted in the frame 13, which is fastened to the shaft C in a customary manner. Each commutator segment has a slotted end 14 to which the connector or connector-neck 15 is attached in accordance with my invention. The end 14 of the commutator segment is sawed, or otherwise slotted on a radial plane, the slot being of a width just sufficient to admit the connector 15, the inner end of which has a cut-away portion or opening 17. After the connector 15 is placed in position in the slot formed in the commutator segment, the material of said segment adjacent to said opening, that is, a part of the metal in the side 14^a (Figs. 5 and 13), is forced into the opening or cut-away portion 17 preferably by means of a die, or embossing tool, which is similar in shape to the opening or cut-away portion 17, but of a slightly smaller size. The commutator segments and connectors thus fastened together are clearly shown in Figs. 2 to 5 inclusive.

It may be desirable for the purpose of increasing the current carrying capacity of the connector to use several of said connectors in parallel and fasten same to a single commutator segment. In Fig. 2 I have shown my invention applied to a single commutator connector fastened to a single commutator segment, and in Fig. 3 a double commutator connector 15^a fastened to a single commutator segment 12^a.

In the slightly modified form of my in-

vention shown in Figs. 12 and 13, the side of connector 15 is cut-away to form an opening or recess 17 into which the material of the segment is forced by a properly shaped
5 embossing tool.

The outer end of commutator connector 15 shown in Fig. 2 has riveted thereto at 18 a strip 19, which together with the outer end of said connector forms a pocket
10 to receive the end or ends of the armature coils E. These coil ends are soldered or otherwise fastened in said pockets. In Fig. 3 the outer end of a double commutator connector 15^a has its members spread apart to
15 form a pocket to receive the ends of said armature coils. The adjacent connectors are separated from each other at their outer ends by insulating strips or wedges 20. To avoid the use of rivets in the commutator
20 connectors, I prefer to use the arrangement shown in Figs. 7 to 11 inclusive. In this arrangement the outer end of the flat strip forming the connector 15 is bent at 21 into
25 a plane parallel to the remainder of the connector and just below said bend 21 a plurality of rectangular holes 22 are formed. The auxiliary strip 23 shown more clearly in Figs. 10 and 11 is punched to form the
30 ears or tabs 24 which are adapted to pass through the openings 22 and have their ends bent as shown at 25 in Figs. 7 and 8. This

arrangement forms a simple, inexpensive and readily assembled structure which provides a pocket at 26 to receive the ends of the armature coils E.

I aim in the appended claims to cover all modifications which do not depart from the spirit of my invention.

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

1. As an article of manufacture, a commutator segment having one end slotted, combined with a connector consisting of a flat strip of conducting material having an opening or cut-away portion in one end, said strip fitting in the slot in said segment and part of the material of said segment adjacent to the opening in said connector filling said opening.

2. A commutator segment comprising a bar having a slot, and an extension or neck having an apertured end seated in said slot, the side of the bar being locally depressed into the aperture.

In testimony whereof I affix my signature, in the presence of two witnesses.

HOWARD H. RALSTON.

Witnesses:

L. LOWENBERG,
FRED J. KINSEY.