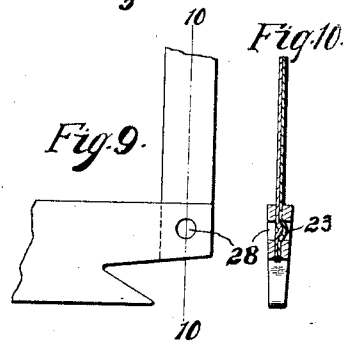
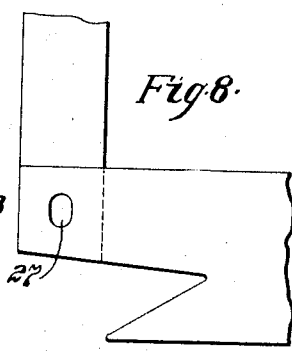
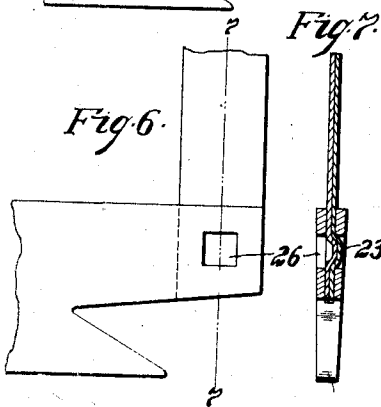
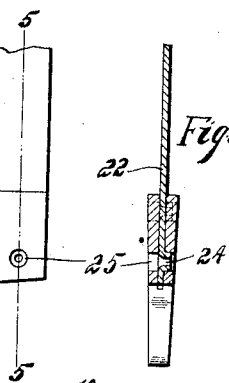
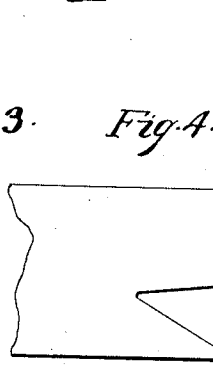
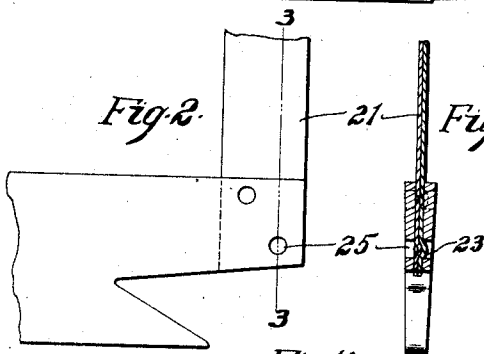
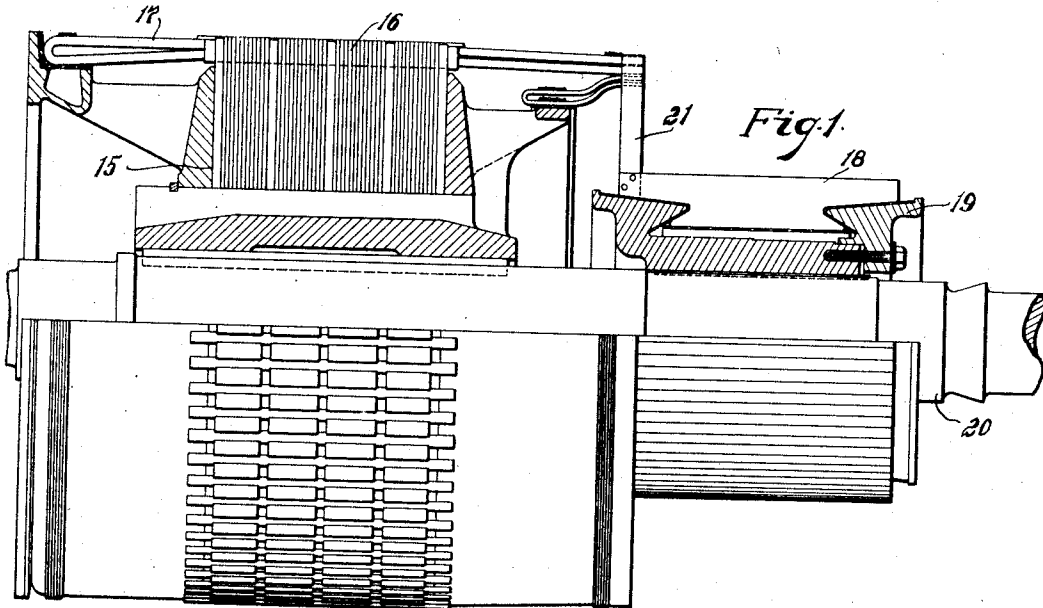


H. H. RALSTON.
DYNAMO ELECTRIC MACHINE.
APPLICATION FILED SEPT. 14, 1905.

1,009,788.

Patented Nov. 28, 1911.



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Attorney.

UNITED STATES PATENT OFFICE.

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

DYNAMO-ELECTRIC MACHINE.

1,009,788.

Specification of Letters Patent. Patented Nov. 28, 1911.

Application filed September 14, 1905. Serial No. 278,488.

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 armature coils.

It is essential in making the connection 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 segments and connections pulling apart during the operation of the machine.

In carrying out my invention I perforate one end of the segment and force a part of the material of the connector into the perforation, whereby the segment and connector will be securely held together.

My invention further consists in the combination of a segment having a radial slot or recess and one or more lateral openings or perforations, and a connector seated in said slot or recess and having a portion of its material forced into the opening or openings.

In another aspect my invention comprises the method of fastening the commutator connector to the commutator segment, which method consists in slotting or recessing the end of the segment and perforating said slotted or recessed end, placing the connector in the slot or recess and forcing a part of the material of the connector into the perforation or perforations of the segment.

In the accompanying drawings which illustrate my invention, Figure 1 is an elevation partially in section of an armature equipped with my invention; Fig. 2 is a partial elevation of a segment showing my improved connecting means; Fig. 3 is a section along the line 3—3 of Fig. 2; Fig. 4 is a view similar to Fig. 2, showing a modification; Fig. 5 is a section along the line 5—5

of Fig. 4; Fig. 6 is a view similar to Fig. 2, showing a second modification; Fig. 7 is a section along the line 7—7 of Fig. 6; Fig. 8 is a partial elevation of a segment and connector, showing a third modification; Fig. 9 is a view similar to Fig. 2, showing a fourth modification; and Fig. 10 is a section along the line 10—10 of Fig. 9.

Referring to the figures of the drawing, the armature 15 is provided with a laminated core 16, and armature coils 17 connected to the segments 18 of the commutator mounted in frame 19, which frame is fastened to the shaft 20 in the customary manner. Each commutator segment is perforated at one end and the end is also sawed or otherwise slotted on a radial plane, the slot being of a width just sufficient to admit the connector:

The connector consists preferably of two flat strips of good conducting material side by side as shown at 21 in Figs. 3, 7 and 10, or it may consist of a single strip of metal as shown at 22 in Fig. 5. After the connector is placed in position in the slot formed in the commutator segment, a suitable die or embossing tool is inserted in the perforation at one side of the segment and the material of the connector is forced into the perforation at the other side of the segment. The tool may be inserted just far enough and with sufficient pressure to form a depression and force the material a slight distance into the perforation of the segment as shown at 23 in Figs. 3, 7, and 10, or if desired the tool may be forced entirely through the connector, forcing the material into the segment and against the walls of the perforation as shown at 24 in Fig. 5. In either case the metal of the connector is sufficiently displaced or forced out of the plane of the slot so that the parts will be securely held together.

The number and shape of the perforations in the segment may be varied to a considerable extent. I prefer two circular perforations as are shown at 25 in Figs. 2, 3, 4 and 5. In Fig. 6 I have shown at 26 a single square or rectangular perforation; in Fig. 8 a single oval shaped perforation 27; and in Fig. 9 a single circular perforation 28.

It will be seen that my fastening means is simple but nevertheless effective and durable.

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. In combination, a commutator segment having a slot or recess and an opening or perforation, and a connector inserted in said recess and held to the segment by a portion of the material of the connector forced into the opening or perforation, said connector fitting closely into said recess so as to form a good connection of low electrical resistance.

2. In combination, a commutator segment having a radial slot or recess and one or more lateral perforations or openings, and

a connector fitting tightly in said slot or recess and having a projection or lug which fits into each lateral perforation or opening of the segment.

3. In combination, a commutator segment having a radial slot or recess and one or more lateral perforations or openings, and a connector fitting tightly in the slot or recess and having a part of its material embossed or spread into said lateral opening or openings in the segment.

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

HOWARD H. RALSTON.

Witnesses:

ARTHUR F. KWIS,
FRED J. KINSEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."