(No Model.)

F. A. PERRET.

DYNAMO ELECTRIC MACHINE.

No. 432,169. Patented July 15, 1890.

Fig. 1.

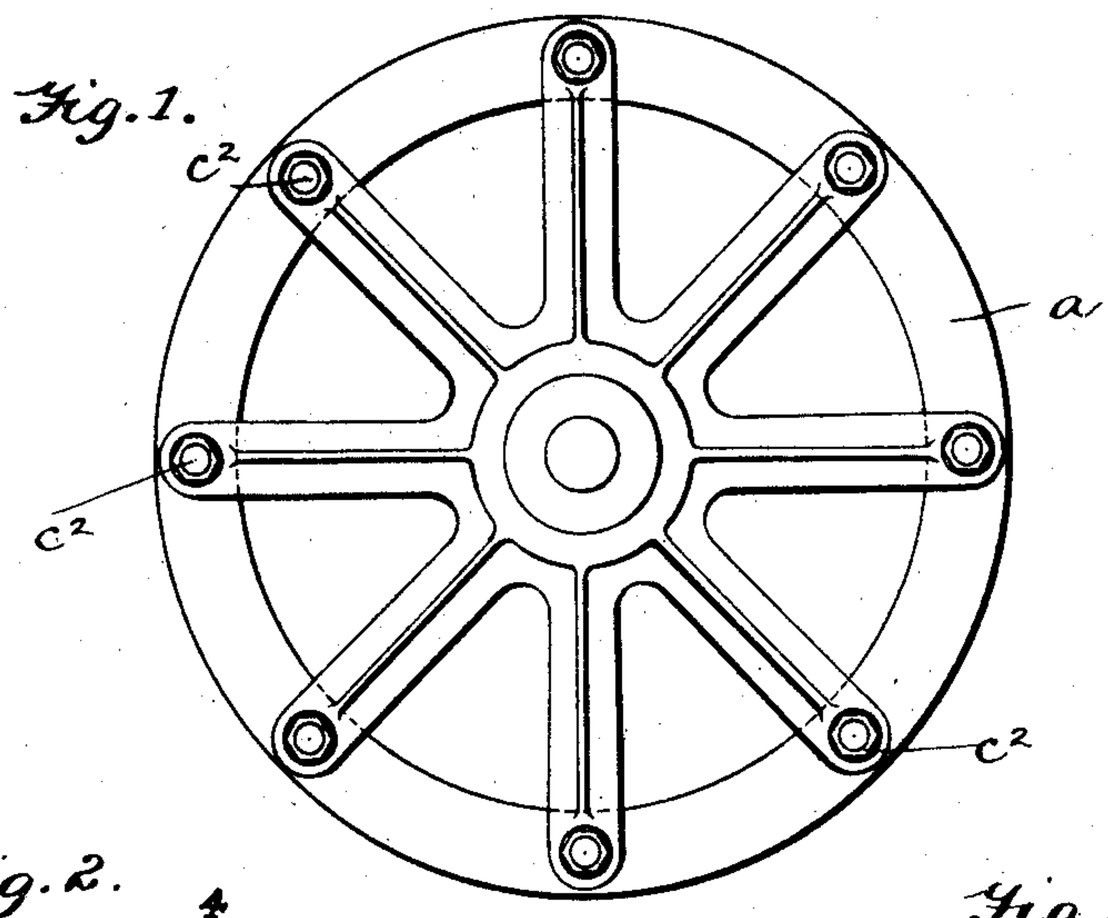


Fig. 2.

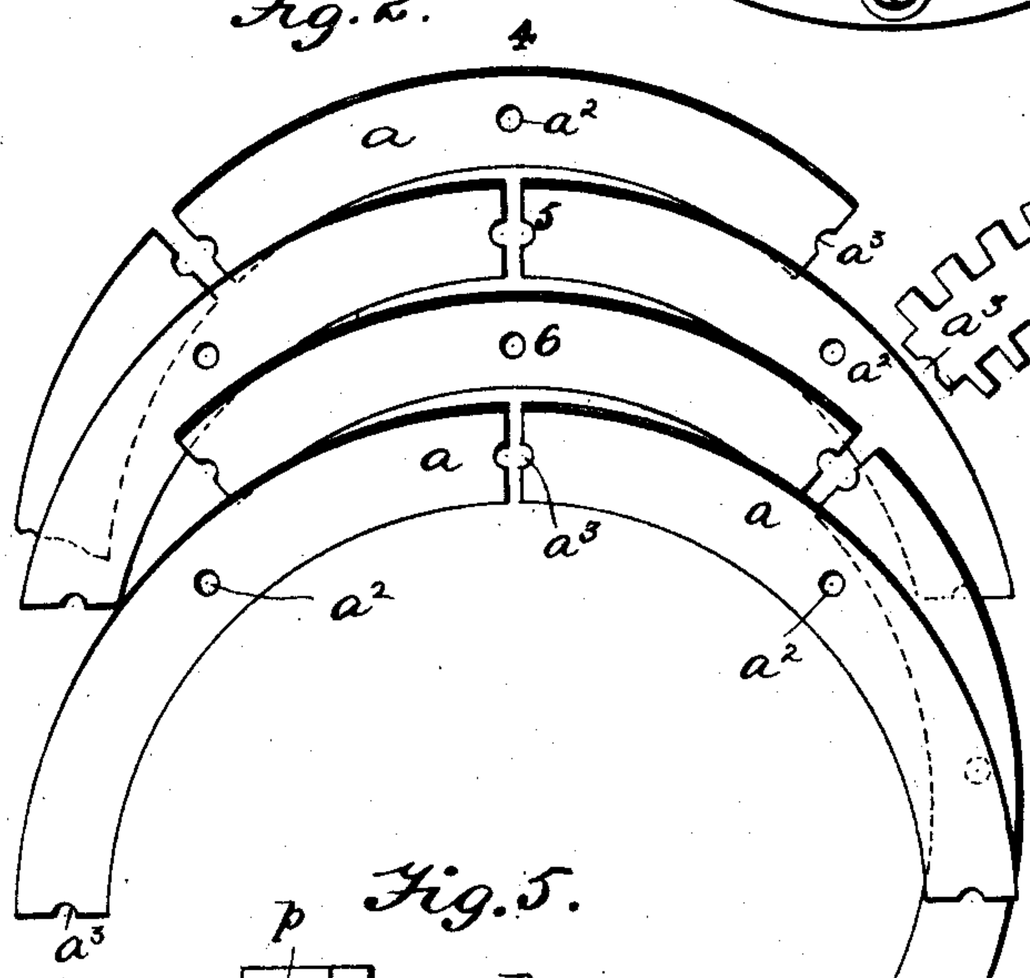
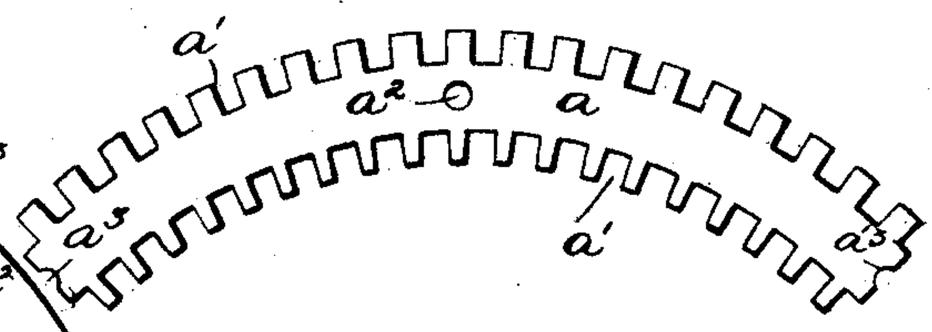


Fig. 3.



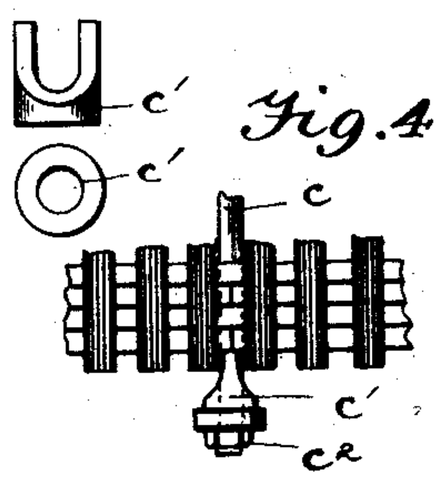
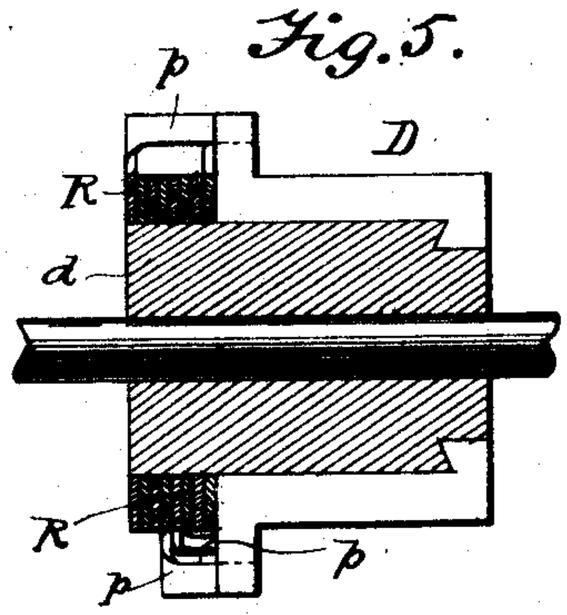


Fig. 4.

Fig. 5.



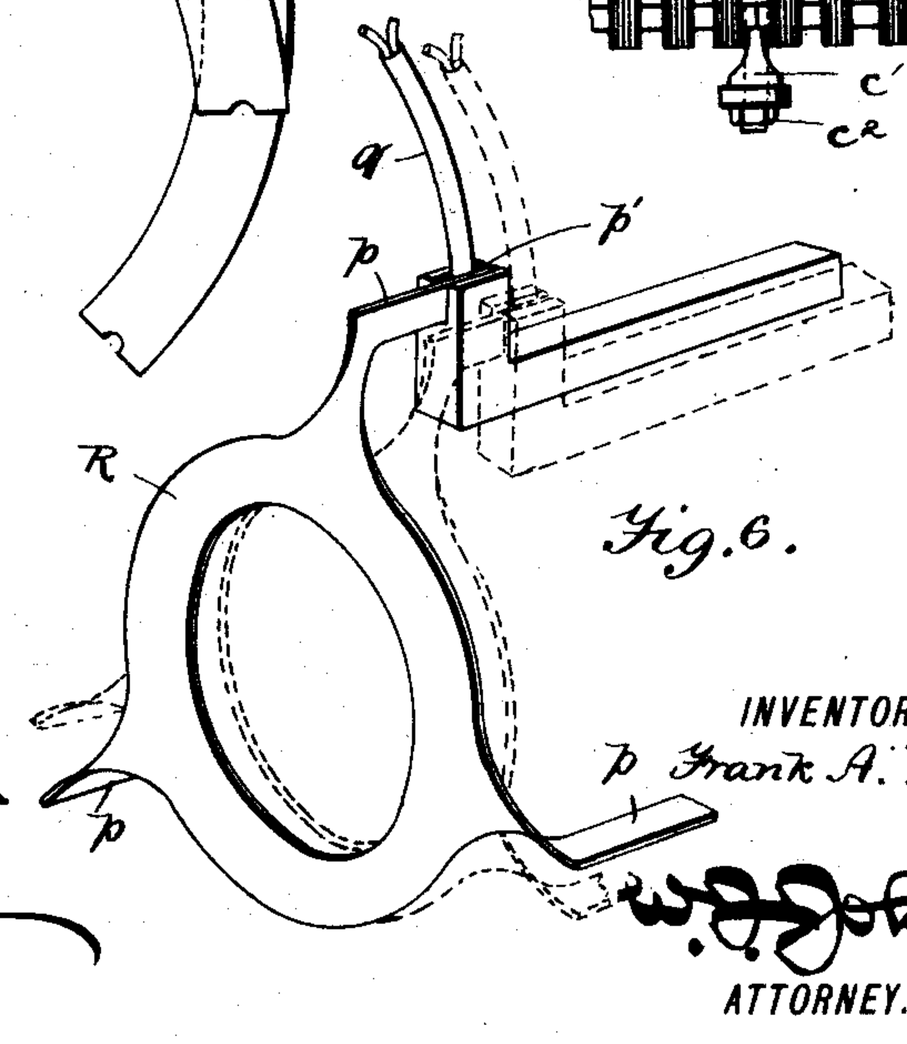


Fig. 6.

WITNESSES:

Frank S. Ober.

Thomas K. Trenchard.

INVENTOR

Frank A. Perret.

W. J. Johnston

ATTORNEY.

UNITED STATES PATENT OFFICE.

FRANK A. PERRET, OF BROOKLYN, NEW YORK.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 432,169, dated July 15, 1890.

Application filed February 24, 1890. Serial No. 341,558. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. PERRET, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is a specification.

This invention has reference to dynamo-electric machines; and it consists of improvements in the construction of armatures and commutators, the design of which is to cheapen the cost of manufacture, and, as regards the commutator, to provide a simple and cheap manner of "cross-connecting" the segments thereof and of connecting the ends of the armature-coils with the commutator-segments.

The details of the invention will be described with reference to the accompanying drawings, in which—

Figure 1 represents an end view of the armature, showing more particularly the spider supporting it. Fig. 2 is a conventional perspective of a few of the armature-plates, showing how they are put together. Fig. 3 is a detail plan of one of the armature-plates. Fig. 4 is a partial plan of one end of the armature, showing the coils in position, the manner of binding the plates together, and a peculiar form of boss or sleeve used. Fig. 5 is a longitudinal section of a cross-connected commutator; and Fig. 6 is a detail perspective of one of the cross-connecting rings and a commutator-segment, also showing the manner of connecting the ends of the armature-coils.

The armature is constructed on the general plan of a Pacinotti ring. It is built up of iron plates *a*, each of which forms a segment of each layer. The plates I have shown are each one-fourth of a ring or layer; but it is obvious that they may be made any fraction thereof. Each plate is formed with the notches *a'* for the coils peculiar to the Pacinotti type, and with a perforation a^2 in the center and a half-circle a^3 cut out of each end. When the plates of one layer are placed together, the half-circles meet, forming a complete circle or perforation of the same diameter as the central perforation. These plates are placed together in the armature so that they will break joints—*i. e.*, the middle or central portion of the plates of one layer are placed opposite the joined ends of the plates in the next adjacent layers. Thus in Fig. 2 the middle of plate 4 is opposite the joint 5 in the next layer, and joint 5 is in line with the middle of plate 6, and so on throughout the armature. This is done to bring the perforations in the middle of the plates in line with those at the joints, so that binding-rods *c* may pass entirely through the completed structure. The rods having all been inserted, a small boss or sleeve *c'* is placed over the ends of each. This sleeve has cut-away sides, as shown, forming two legs, and these rest against the end plates of the armature, the arms of the spider abutting against their opposite ends. The parts are then brought up tightly together by nuts c^2. The object of the legs on the sleeve is to permit the sleeve to enter the narrow space between the coils on each side of it, otherwise the space at those points must be wider than the other spaces around the armature. The width of the legs is sufficient to fully bridge and secure a joint between the plates. An armature knitted together or overlapped and then bound by the rods in the manner described must necessarily be very strong—much stronger, in fact, than if the joints were in a straight line. Another advantage gained by this construction is that I may make the plates as small a fraction of a circle as desired, thereby saving the expense of large dies, which are made with great difficulty.

In machines having more than two field-magnet pole-pieces it is desirable to dispense with the extra number of collecting-brushes which ordinarily have to be used, and this has been done by what is known as "cross-connecting" the segments of the commutator. I have shown in Figs. 5 and 6 a simple way of cross-connecting for a six-pole machine. It consists of a series of metallic rings, in number one-third of the number of commutator-segments. Each ring R for a six-pole machine has formed upon it three angular lugs *p p p*, which are placed one hundred and twenty degrees apart. The rings are placed upon the extended hub *d* of the commutator D, and are suitably insulated from each other. The three lugs *p* of each ring are to be connected, respectively, with three of the commutator-segments standing one hundred and twenty degrees apart. This is done as the rings are placed in position by bending the

lugs at right angles to the plane of the ring and placing them in notches p', formed in the segments. As the rings are adjusted successively, each one is placed on its axis, so that its lugs will stand in the planes of the three segments next to those previously connected, and so on until the cylinder is completed. The cross-connection having been made, the ends of the armature-coils (which are represented in Fig. 6 by q) are brought down and inserted in the notches of the commutator-segments beside the lugs. Then by solder or other means a rigid connection of the parts is made. I am able, therefore, to make a complete cross-connected commutator before putting it upon the shaft. Besides this I save the space between the commutator and armature usually occupied by these connections.

Having thus described my invention, I claim—

1. In a ring-armature, the combination of the core, the coils thereon, a supporting-spider, and the two-legged sleeve or boss inserted between the arms of the spider and the end of the core, for the purpose described.

2. The combination, with a commutator whose segments are slitted in planes radial to the shaft, of cross-connecting rings made of sheet metal and having integral lugs which are bent at right angles to the rings and extend into the radial slits in the commutator-segments, whereby a simple and compact connection is made with said segments.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

FRANK A. PERRET.

Witnesses:
JOHN F. O'BRIEN,
JAMES J. MADIGAN.