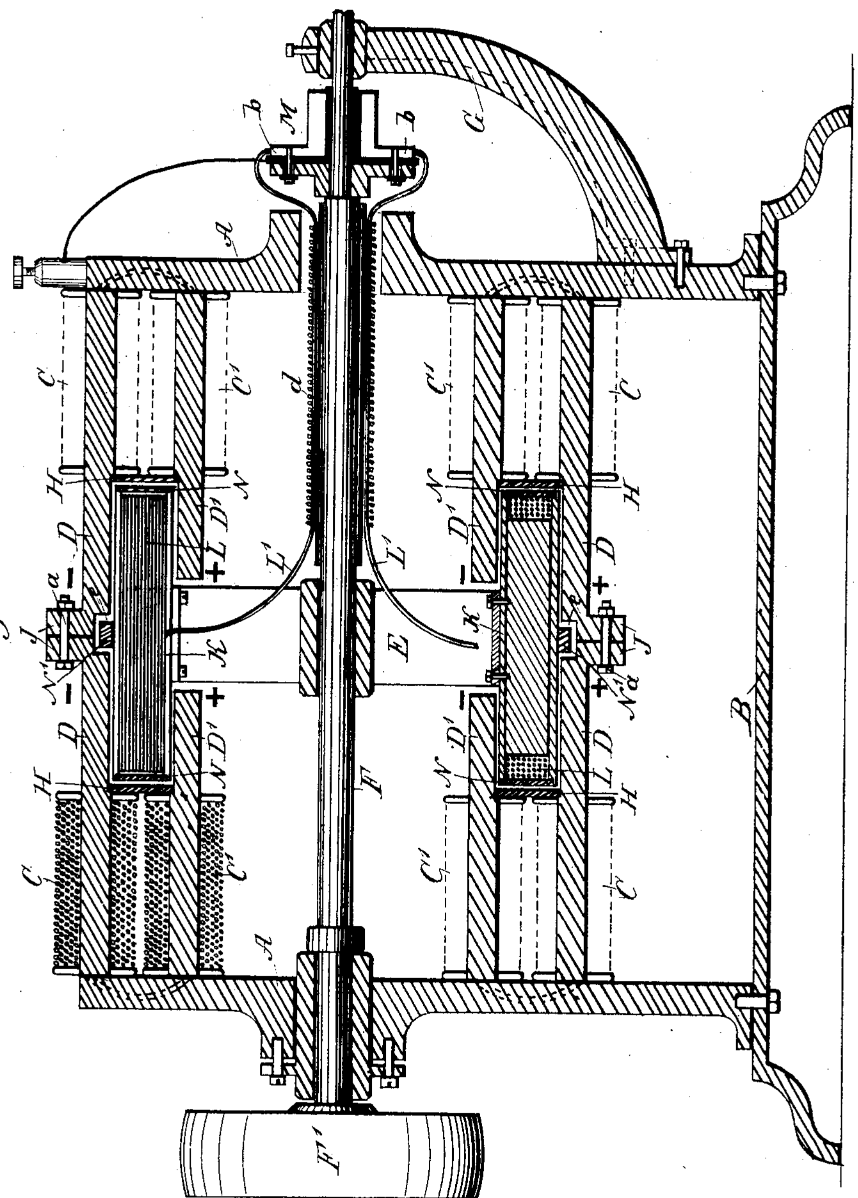
(No Model.) 2 Sheets—Sheet 1.

H. J. MÜLLER.

DYNAMO ELECTRIC MACHINE.

No. 265,853. Patented Oct. 10, 1882.

Fig. 1.



WITNESSES:

Otto Beyer

B. G. Underwood.

INVENTOR:

H. J. Müller

BY Munn & Co

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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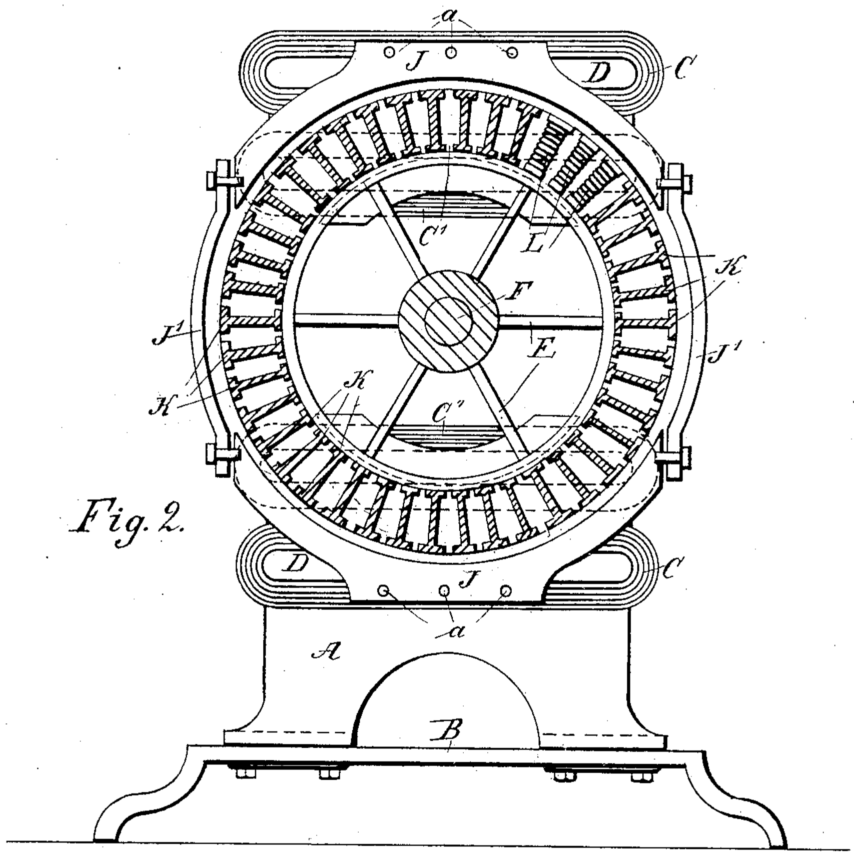


Fig. 2.

Fig. 4.

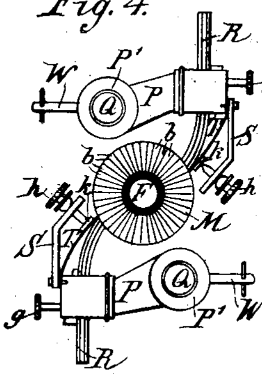
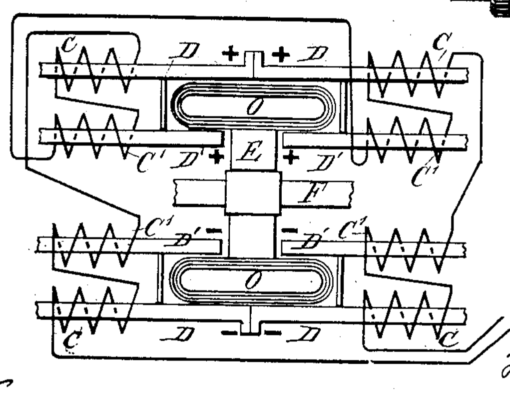


Fig. 3.



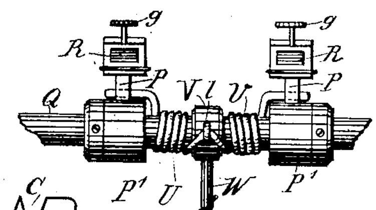


Fig. 5.

WITNESSES:

Otto Beyer

B. G. Underwood.

INVENTOR:

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N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

HANS J. MÜLLER, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF AND ALEXANDER LEVETT, OF SAME PLACE.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 265,853, dated October 10, 1882.

Application filed March 11, 1882. (No model.)

To all whom it may concern:

Be it known that I, HANS J. MÜLLER, of the city, county, and State of New York, have invented a new and Improved Dynamo-Electric Machine, of which the following is a full, clear, and exact description.

The invention consists in a dynamo-electric machine constructed with two sets of field-magnets, which are united and combined in such a manner as to form two double outer poles, and four independent inner poles, between which poles the armature rotates, the armature-coils being overlapped by the projecting ends of the magnet-cores. The coils of the magnets can be united in such a manner that the polarity of the double pole and the corresponding inner poles will be alike or opposite, as may be necessary, according to the kind of armature used.

The invention further consists in swinging brush-holders, combined with springs for holding the ends of the brushes on the commutator, and with springs for pressing the brush-holders toward the commutator.

The invention also consists in details of construction and combinations of parts, as will be fully described hereinafter.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of my improved dynamo-electric machine. Fig. 2 is a cross-sectional elevation of the same. Fig. 3 is a diagram of the same, showing a different connection of the wires of the field-magnets. Fig. 4 is an end elevation of the commutator and brush-holder. Fig. 5 is a longitudinal elevation of the brush-holder.

Two end standards or uprights, A, are securely mounted on a base, B. A set of magnets, C C C′ C′, are held between these standards at the top and bottom thereof. The cores D of the outer magnets, C, extend to the middle of the machine, and at their meeting ends are provided with outwardly-projecting flanges J, through which bolts or rivets *a* are passed for uniting the adjoining ends of the cores; or these cores can be united in any other suitable manner. The inner ends of the cores D′ of the inner magnets, C′, do not meet, but are separated a distance slightly greater than the width of the armature-wheel E, rigidly mounted on a shaft, F, journaled in one of the end standards A and in an arm, G, projecting from the outer surface of the other standard. The shaft F is provided with a belt-pulley, F′. The cores D D′ of the magnets C C′ are braced and separated at the inner ends of the wire coils by brass strips H. The ends of the flanges J are united by brass braces J′. The ends of the coils of the magnets C C′ are connected in the usual manner—that is, the inner end of one coil with the outer end of the next, and so on.

The ends of the cores of the upper magnets C are united, and form a double negative pole, and the ends of the cores of the upper magnets C′, which are not united, form two single positive poles. The ends of the cores of the lower magnets C are united, and form a double positive pole, and the ends of the lower magnets C′ form two single negative poles. On the rim of the armature-wheel E a series of cores, K, having the cross-section of a double T or H beam, are mounted in such a manner that they will be at right angles to the rim and parallel with the shaft F. The length of each of these cores K is about equal to the distance from the opposite inner ends of the coils of the magnets C C′. The armature-coil wires L are wound on these cores K parallel with the lengths of the same, and the inner end of one coil is united with the outer end of the next coil in the usual manner. From the connecting-wires insulated wires L′ run along the shaft to separate sections *b* of the commutator M, mounted insulated on the shaft F between one standard A and the arm G, which commutator is composed of as many sections *b* as there are coils in the armature. The wires L′ are held on the shaft F by a wire, *d*, wound around these wires and the shaft. The armature-cores K are held together and braced by brass rings N, placed in the ends of the cores, and by a brass ring, N′, passing over the tops of the cores, which ring N′ runs in a groove, *c*, in the inner surface of the field-magnet cores D, at the meeting ends of the same.

In the modification shown in the diagram Fig. 3 the armature consists of a Gramme ring, O, mounted on the shaft F, and also passing in between the ends of the cores D D′. In this case the connections of the field-magnet wires are different. The outer end of the coil of the lower left-hand magnet C is connected with the commutator. The inner end of the coil of this magnet is connected with the outer end of the coil of the lower left-hand magnet C′. The inner end of the coil of this magnet is connected with the inner end of the coil of the upper left-hand magnet C. The outer end of the coil of this magnet is connected with the inner end of the coil of the upper left-hand magnet C′. The outer end of the coil of this magnet is connected with the inner end of the coil of the upper right-hand magnet C′. The outer end of the coil of this magnet is connected with the inner end of the coil of the upper right-hand magnet C. The outer end of the coil of this magnet is connected with the outer end of the coil of the lower right-hand magnet C′. The inner end of the coil of this magnet is connected with the outer end of the coil of the lower right-hand magnet C, and the inner end of the coil of this magnet is connected with the commutator, all as shown in Fig. 3.

The ends of the cores of the upper pairs of magnets will be positive, and the ends of the cores of the lower pairs of magnets will be negative, as indicated by the corresponding signs in Fig. 3. In both cases the greater parts of the armature-coils are surrounded by the cores D D′ of the magnets C C′, and an extraordinarily large induction-surface is obtained, and the coils rotate in segmental spaces formed by the ends of the cores of the field-magnets. By uniting the cores of the outer magnets I obtain an outer double pole and two independent inner poles, and accordingly, as the coils are united, the polarity of the outer double pole will be the same as that of the inner single independent poles, or the reverse, by a slight change in the connections of the magnet-coils. I can thus change the magnets to operate either with a Gramme ring or with the Siemens armature, as indicated in Figs. 3 and 1, respectively.

The brush-holders P are attached to sleeves P′, loosely mounted on spindles Q, projecting from the outer surface of one of the standards A. The brushes R are held in the brush-holders by binding-screws *g*. The ends of the brushes R are pressed upon the surface of commutator M by screws *h* passing through the ends of arms S of the brush-holders P, the ends of the screws *h* resting on metal plates or disks *k* at the ends of springs T, secured to the brush-holders P, which springs T press the ends of the brushes upon the commutator. Springs U are coiled on the spindles Q, and the ends of the springs rest against the outer edges of the brush-holders. The middle of the springs U pass over hooks *l*, or through eyes or loops of sleeves V, loosely mounted on the spindles Q, and each provided with a binding-screw, W. The springs U can be secured or held to sleeves V in any other suitable manner. By turning the sleeves V in the direction toward the upper or outer ends of the brush-holders the tensions of these springs U will be increased, and those tensions can be maintained by locking the sleeves V in position by means of the binding-screws W. The springs U can thus be adjusted according to the desired pressure of the brushes on the commutator.

The brush-holders P can swing on the spindles Q, and will present a uniform end surface to the commutator independently of wear of the ends of the brushes—that is, they adjust themselves automatically to always present the same end surface to the commutator. I have shown two brush-holders on each spindle Q; but there may be one or more brush-holders on each spindle.

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

1. A dynamo-electric machine constructed with two sets of field-magnets, each set composed of four electro-magnets, and each set forming a double outer and two inner poles, substantially as herein shown and described, and for the purpose set forth.

2. In a dynamo-electric machine, the combination, with a rotary armature, of field-magnets having in each set of magnets an outer double pole and two inner single poles, the outer and inner poles being of opposite polarity, substantially as herein shown and described, and for the purpose set forth.

3. In an armature of a dynamo-electric machine, the combination, with the armature-wheel E, of the cores K, the coils L, and the bracing-rings N in the ends of the cores K, substantially as herein shown and described, and for the purpose set forth.

4. In a dynamo-electric machine, the combination, with the armature-wheel E, of the cores K, the coils L, and the bracing-rings N and N′, substantially as herein shown and described, and for the purpose set forth.

5. In a dynamo-electric machine, the combination, with a swinging brush-holder, of a spring for pressing the brush-holder toward the commutator and a spring for pressing the end of the brush upon the commutator, substantially as herein shown and described, and for the purpose set forth.

6. The combination, with the brush R, a holder, P, and spring T for pressing on the former, of the bracket or fixed arm S, and screw *h* for adjusting the pressure of said spring, as shown and described.

7. In a dynamo-electric machine, the combination, with the brush-holder P and brushes R, of the arm S and the screw *h*, substantially as herein shown and described, and for the purpose set forth.

8. In a dynamo-electric machine, the combination, with the brush-holder P, of the arm S, the screw h, and the spring T, substantially as herein shown and described, and for the purpose set forth.

9. In a dynamo-electric machine, the combination of the sleeve V, having hook l, and the clamp-screw W, as shown, with the spindle Q, the spring U, coiled on the latter, and the swinging brush-holder P, all as shown and described.

HANS J. MÜLLER.

Witnesses:
OSCAR F. GUNZ,
C. SEDGWICK.