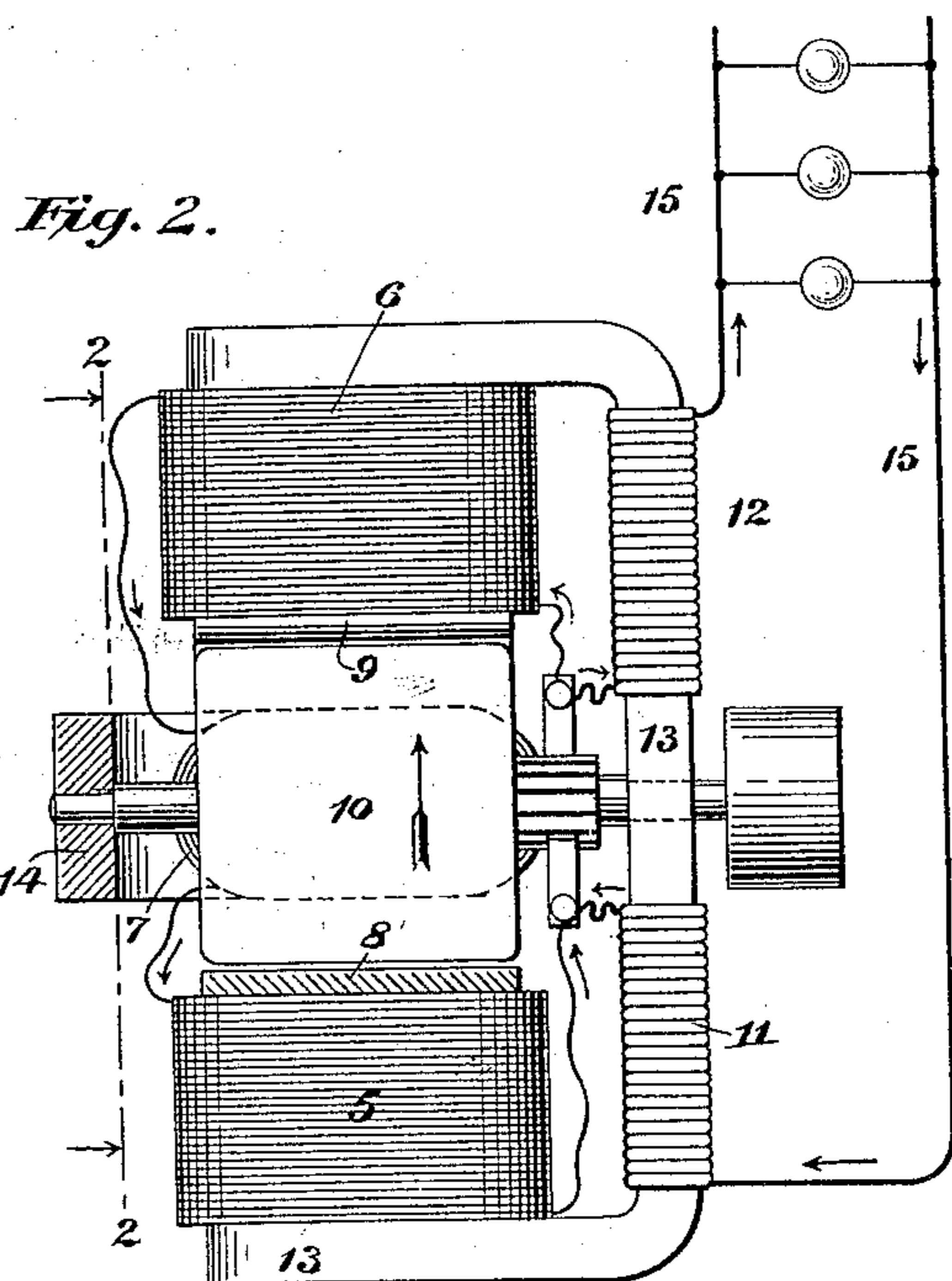
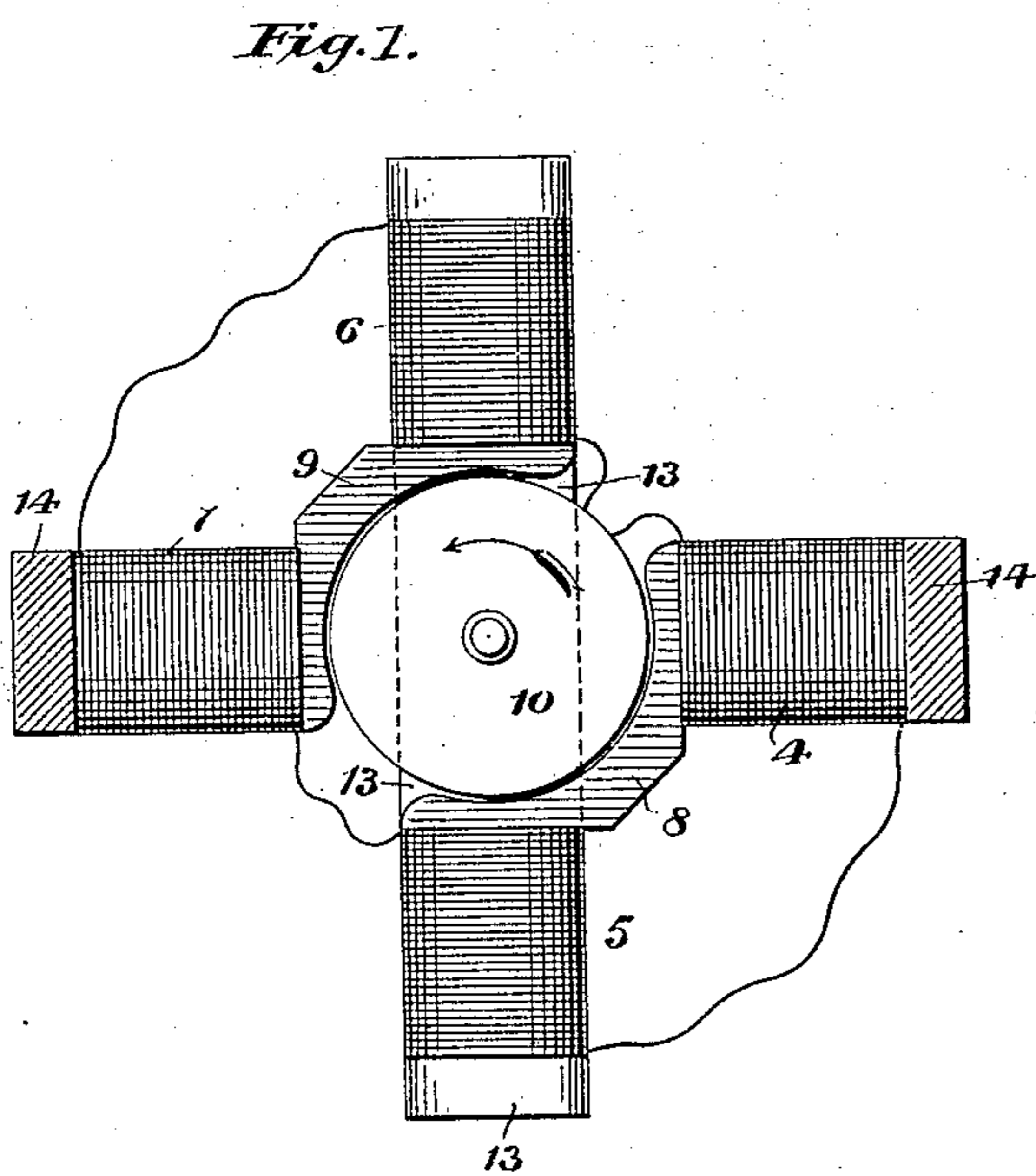


(No Model.)

O. P. LOOMIS.
DYNAMO ELECTRIC MACHINE.

No. 405,218.

Patented June 11, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

OSBORN P. LOOMIS, OF SOMERVILLE, MASSACHUSETTS.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 405,218, dated June 11, 1889.

Application filed January 31, 1889. Serial No. 298,175. (No model.)

To all whom it may concern:

Be it known that I, OSBORN P. LOOMIS, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Dynamo-Electric Machines, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to means for regulating dynamo-electric machines.

The object of the invention is to prevent what is known as "lead" in dynamo-electric machines. The cause of this so-called "lead," as is well known, is the distortion of the lines of force out of their true path from pole to pole by the magnetism generated in the armature by the current flowing around said armature. When more current flows there is more lead, as a natural consequence. In my invention I propose to counteract this lead of magnetism of the pole-pieces by changing it backward gradually under changes of load, thus keeping the brushes always at a non-sparking point, and thereby securing a maximum amount of work from the machine.

In the accompanying drawings I have shown a dynamo-electric machine made in accordance with my invention.

In said drawings, Figures 1 and 2 are end and side views, respectively, of my improved dynamo, partly in section.

My improved dynamo is constructed with two sets of shunt-wound field-magnets 4 5 and 6 7, diametrically opposite each other, the magnets 4 5 constituting one set and the magnets 6 7 constituting the other set of magnets, like poles of each set being attached to common pole-pieces 8 and 9, as shown in the drawings.

10 is the armature thereof, which is provided with commutator-brushes and electrical connections, as ordinarily. The resistances of the shunt-magnets are arranged so that when no load is on the machine the magnets 4 5 are of equal strength, so that the line of polarity is in the center of the pole-piece 8. So, also, the magnets 6 7 are made of equal strength, so that the polar line will pass

through the center of the pole-piece 9. When, therefore, there is no load on the machine, the line of magnetization is from the center of the pole-piece 8 to the center of the pole-piece 9; but when a load comes on the armature the magnetism generated in said armature tends to shift the polar line in the direction of the magnets 4 and 7, when the machine is rotated in the direction of the arrow.

The outer magnet ends of the opposite magnets 5 6 and 4 7 are connected together by bow-shaped yokes 13 and 14, respectively, the yoke 13 in Fig. 1 being illustrated in dotted lines because at the rear of the apparatus, but shown in full lines in Fig. 2; and the yoke 14, illustrated in Fig. 1, being in front of the machine, is shown as cut away to exhibit the construction more clearly, the said yoke 14 being illustrated in Fig. 2 as having half of its side portion cut away to exhibit the construction of the machine and showing it as well as the yoke 13 serving as bearings for the armature-shaft. To prevent the shifting of the polar line, main or series coils 11 and 12 are placed, preferably, only upon the yoke 13, that joins the ends of the opposite magnets 5 and 6 together, the other yoke 14 being unprovided with any series coils, as one set of series coils 11 and 12 will serve the purpose. These series coils 11 and 12 will create a counterbalancing polar line in the direction of the magnets 5 6, and thus bring back the polar line to the center of the pole-pieces 8 and 9. Therefore there will be no lead and no sparking, and the brushes will be kept all the time at the maximum point. It will be noted that the greater the tendency of the polar line to shift, the greater will be the amount of current passing through the coils 11 and 12, so that a correspondingly-increased force will be tending to draw the polar line back to its former position. Thus the polar line is kept from shifting under all loads and circumstances, and sparking prevented.

15 is the working-circuit, supplying any suitable translating devices with current.

If the machine is to be run in a reverse direction, the series coils 11 and 12 should be located upon the yoke 14, instead of the yoke 13.

The feature of my construction which I regard as novel is having two sets of magnets

diametrically opposite, with like poles attached to a common pole-piece, the outer magnet ends of the opposite magnets of each set being connected to each other, respectively, by yokes 13 and 14, and one of the opposite magnets of each set of magnets provided with series coils, for the purpose described. By connecting magnets 5 and 6 together by yoke 13, I make them independent of magnets 4 and 7, so that the coils 11 and 5 and 6 and 12 mutually help each other without influencing the magnets 4 and 7, which are connected together by another separate yoke 14.

Having fully pointed out my improved construction of dynamo, what I desire to claim and secure by Letters Patent of the United States as my invention is—

1. A dynamo-electric machine consisting of two sets of shunt-magnets diametrically opposite, like poles being connected to a common pole-piece and having the outer ends of the opposite magnets of each set connected together by yokes, and series coils wound

upon said yoke or yokes so as to generate a counterbalancing field of force and prevent the polar line from shifting.

2. The combination, in a dynamo-electric machine, of two sets of oppositely-arranged shunt-magnets 4 5 and 6 7, joined, respectively, to common pole-pieces 8 and 9, those of each set being of equal strength, yokes 13 and 14, connecting the outer magnet ends of the magnets 5 6 and 4 7 together, respectively, and serving as bearings for the armature, and series coils 11 and 12, wound upon said yoke or yokes, substantially as set forth, so as to set up a counterbalancing field of force to prevent the shifting of the polar line.

In testimony whereof I have hereunto set my hand and affixed my seal, this 29th day of January, 1889, in the presence of two subscribing witnesses.

OSBORN P. LOOMIS. [L. S.]

Witnesses:

PAUL F. C. TUCKER,
WILLIS FOWLER.