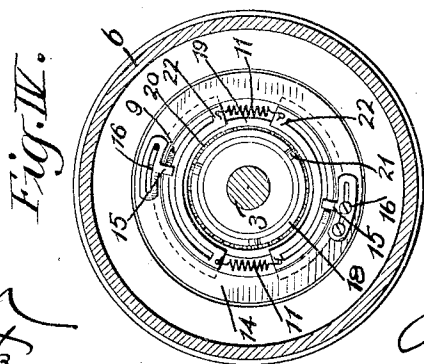
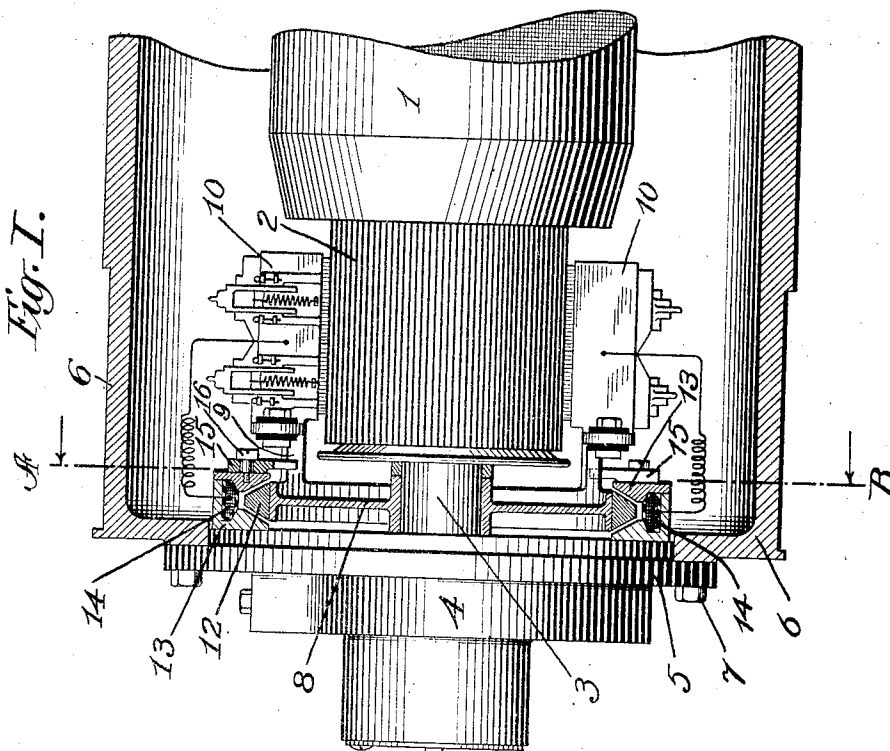
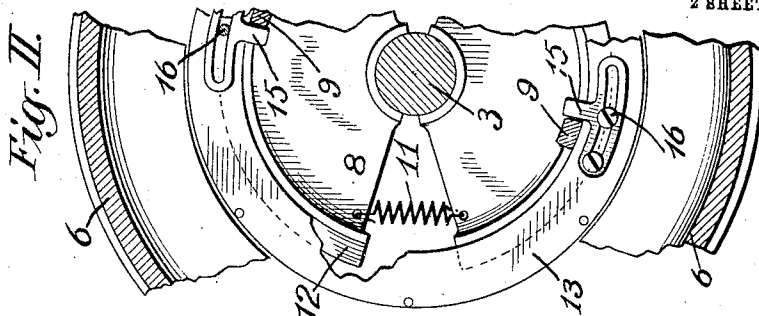


J. L. CREVELING.
 REVERSIBLE BRUSH HOLDER FOR USE WITH DYNAMOS.
 APPLICATION FILED AUG. 25, 1911.

1,058,730.

Patented Apr. 15, 1913.

2 SHEETS-SHEET 1.



WITNESSES
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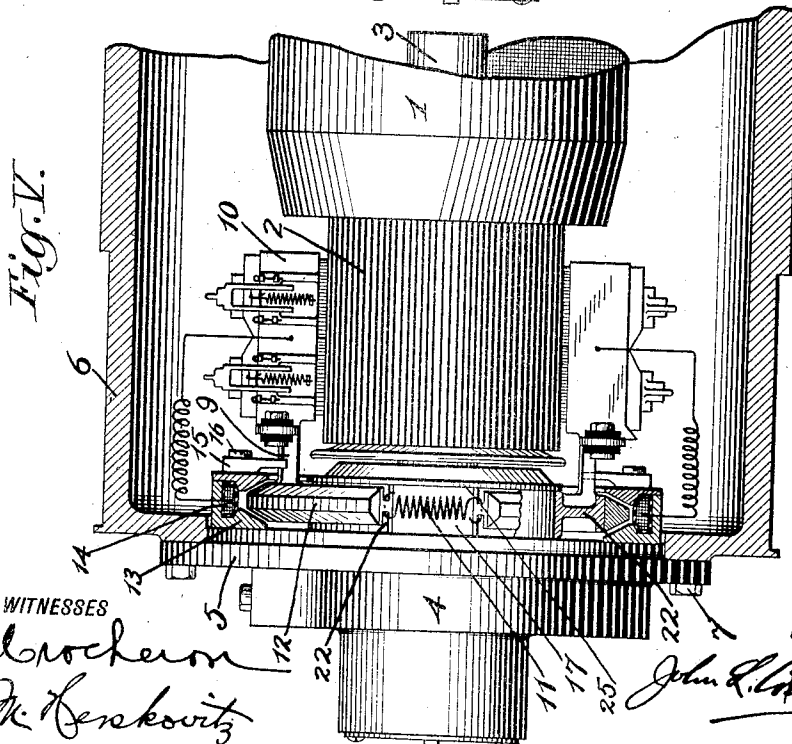
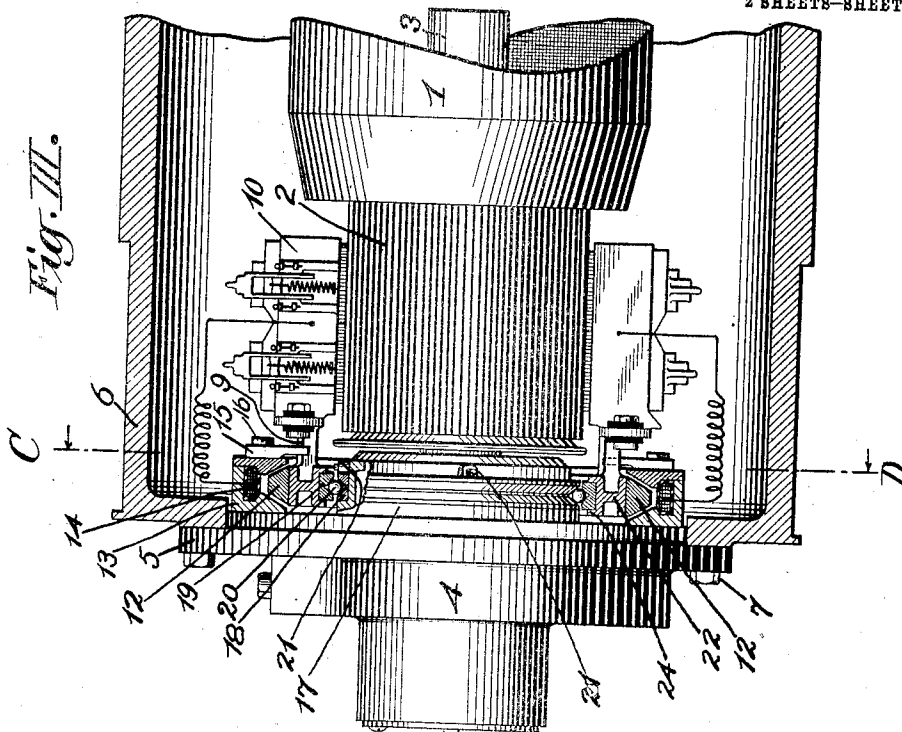
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J. L. CREVELING.
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1,058,730.

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2 SHEETS-SHEET 2.



WITNESSES

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REVERSIBLE BRUSH-HOLDER FOR USE WITH DYNAMOS.

1,058,730.

Specification of Letters Patent.

Patented Apr. 15, 1913.

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To all whom it may concern:

Be it known that I, JOHN L. CREVELING, a resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Reversible Brush-Holders for Use with Dynamos, as set forth in the annexed specification and drawings, forming a part thereof.

My invention relates to dynamos or generators and has for its particular object to provide a dynamo wherein the direction of current supplied will remain uniform throughout reversals in direction of rotation of the armature.

Figure I is a partial longitudinal section and elevation of one type of generator embodying my invention. Fig. II is an end section and partial elevation of the generator shown in Fig. I taken on the line A—B. Fig. III is a partial longitudinal section and elevation of one type of dynamo comprehending my invention. Fig. IV is an end section and partial elevation of the dynamo shown in Fig. III taken on the line C—D on a smaller scale. Fig. V is a partial longitudinal section and elevation of a generator comprehending one form of my invention.

In the drawing, particularly Figs. I and II, 1 represents an armature of a generator provided with the usual commutator 2 and carried by the shaft 3. 4 is an end casting carrying one of the bearings of the shaft 3 and preferably provided with a flanged portion 5 carried by the field frame 6 and secured thereto as by screws 7. In Figs. I and II 8 represents a pair of webbed members preferably made of bronze, aluminum or some other nonmagnetic material and provided with a bearing portion journaled upon the shaft 3 and also provided with arms 9 which carry the usual brush-holders 10. The parts 8 are preferably held together upon the shaft 3 as by means of springs 11 and are provided at their outer peripheries with a magnetic shoe 12 of iron separated by a narrow air gap from the annular magnet frame 13 containing the exciting winding 14 which may be connected as shown in the drawing in shunt across the brushes carried by the brush-holders 10. This annular magnet frame 13 and its winding 14 are permanently secured within the field frame 6,

while the members 8, integral brush carrying arms 9, and brush-holders 10 are rotatable about the shaft 3 and commutator 2 and have but little friction thereupon. The commutator brushes are slidingly maintained in the brush holders 10 and are each pressed downward by light spiral springs into contact with the commutator 2, as clearly shown in Figs. I, III and V of the drawings. 15 is a stop, or limiting device, carried by the screws 16 in such manner as to engage the arms 9 and prevent rotation of the brushes and members 8 with the armature beyond certain desired limits which in the present instance, inasmuch as a bipolar machine is indicated for sake of simplicity, is substantially 180 degrees, and it will be noted that the stops 15 are made movable to allow for the width of the arm 9 in each direction so that a full 180 degrees may be given to the brushes upon reversal of rotation of the armature and thus upon reversal, the brushes will assume positions at the opposite ends of the axis of commutation depending upon the direction of rotation, and in this way the direction of current delivered may be maintained uniform throughout reversals in direction of rotation of the armature.

In Figs. III and IV the end casting 4 is provided with a hub or extension 17 upon which is fitted an annular ball-bearing member comprising an inner ring 18 and an outer ring 19 both forming a ball-race containing the balls 20. The entire ball-bearing member may be held in place upon the hub 17 as by the members 21 attached to the hub. The members 22 are made of non-magnetic material and flanged as indicated at 24 to fit loosely upon the outer ring 19, and said members 22 are united as by the springs 11 tending to draw them upon the ring 19 of the bearing member 18—19—20. These members 22 are provided with the magnetic shoes 12 separated by a narrow air gap from the magnet frame 13 provided with the winding 14, and the other parts of the device are similar to those described with reference to Figs. I and II.

In the modification shown in Fig. V the parts are the same as shown in the other figures except the hub or extension 17 is pro-

vided with a flange 25 and the members 22 are carried upon said hub.

The practical operation of my dynamo is substantially as follows: If in Figs. I, 5 III and V the armature 1 and commutator 2 be considered as revolving in such direction that the uppermost part is moving toward the observer, the rotatable brush-holders 10, due to the friction of the brushes upon the commutator, will tend to revolve in the same direction and will be stopped in the positions indicated in the drawing by the stops 15 engaging the arms 9, it being noted that in that construction shown in 15 Fig. I the members 8 will revolve with the shaft 3; in that construction shown in Figs. III and IV the members 22 will cause the ring 19 to revolve upon the balls 20; in that construction shown in Fig. V the members 22 will revolve upon the hub 17. If 20 now the generator speed be raised to that point that the electromotive force of the generator be appreciable, the magnet 13-14 will become energized due to the current in the winding 14 and the shoes 12 will be attracted and firmly held within the annular magnet and all frictional contact between the members 8 and any revolving parts of the generator will be broken—that is, in the 30 construction shown in Fig. I the members 8 will be lifted clear of the shaft 3 and no wear will take place due to revolution of the shaft; in that construction shown in Figs. III and IV the members 22 will be 35 lifted clear of the ring 19 and no pressure will be exerted upon the balls or ball-races; in that construction shown in Fig. V the members 22 will be lifted clear of the hub 17 and firmly held within the magnet 13-14. 40 It will be noted that with this construction, when the generator is in operation, the brush rigging will be supported by the electromagnets and these are provided with complete magnetic circuits of iron, or other 45 magnetic material, and, therefore, the attractive force is very great and the brush-holders are firmly held in their proper positions. If now the generator stop, the magnets will release the shoes 12 and the brush rigging 50 will assume the positions shown in the drawings. If the direction of rotation of the armature be changed, the members 8 of the generator shown in Figs. I and II together with the brush rigging therefor will revolve 55 into a reverse position placing the brushes at opposite ends of the axis of commutation and thus compensate for said reversal of rotation. If now the generator voltage rise, the magnet 13-14 will again attract the shoes and lift the supporting members 60 clear of the moving parts of the generator and the brush rigging will again be held in its proper definite relation by means of the magnetic clutches.

From the foregoing it will be obvious that

when my generator is running at such speed as to be useful, all strain upon the brushes and brush-holders will be carried by the magnetic brush-holder supports and not imposed upon any of the members upon which 70 the brush rigging revolves in performing its function of rectifying the polarity of the machine; therefore, chattering or vibration of the brushes due to uneven wear of the commutator will not tend to injure the bearing members and the brush rigging may be 75 carried by loose bearing members so as to be free to revolve readily, as the said bearing members do not have imposed upon them the function of holding the brush rigging in its proper operating relation when the generator is running. 80

I do not wish in any way to limit myself to any of the details of construction or to the exact mode of operation set forth in this application which are given to illustrate types of dynamos comprehending the 85 essentials of my invention.

I make no claim in the present application broadly to rotatable reversible means 90 for maintaining the polarity of the current the same on reversal of the rotation of the armature of a dynamo electric machine in combination with means for stopping the rotation of such pole changing means at 95 the limit of their rotation, together with means for additionally firmly holding the same after the armature has reached its proper speed of rotation, as this constitutes the subject matter of an earlier application filed by me in the U. S. Patent Office 100 on the 7th day of August, 1911 and bearing Serial No. 642,582.

It will be obvious that wide departure in the way of details may be made without departing from the spirit and scope of my invention which is as set forth in the following 105 claims.

I claim—

1. A generator comprehending an armature, a commutator, brush holders and rotatable commutator brushes in operative relation therewith; together with electromagnetic means for supporting said brush holders out of mechanical contact with any of 110 the moving parts of the machine. 115

2. A generator comprehending a commutator, brush holders and commutator brushes in operative relation therewith, rotatable means for holding said brush holders and brushes in operative relation to said commutator, and independent magnetic means for supporting said brush holders out of mechanical contact with any of the moving 120 parts of the machine. 125

3. A generator comprehending a commutator brush holders and commutator brushes in operative relation therewith, rotatable means for carrying said brush holders and brushes and permitting movement of the 130

same, and electromagnetic means for independently supporting said brush holders out of mechanical contact with any of the moving parts of the machine.

- 5 4. A generator comprehending a rotor, current collecting means in contact therewith, means for supporting said collecting

means and allowing motion thereof combined with electromagnetic means for independently supporting said collecting means.
JOHN L. CREVELING.

Witnesses:

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M. HILLOCK.