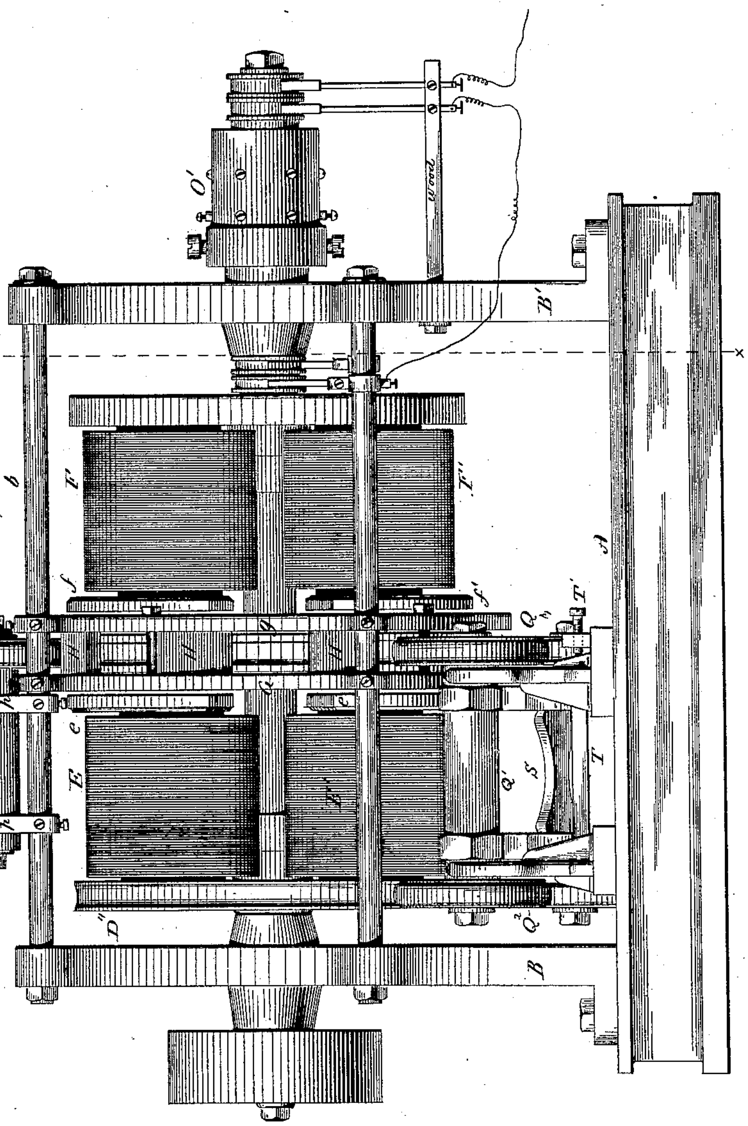
(No Model.) 4 Sheets—Sheet 1.

G. W. FULLER.

DYNAMO ELECTRIC MACHINE.

No. 278,122. Patented May 22, 1883.

Fig. 1



Witnesses.
Eug. E. Quimby
Jos. A. Earle

Geo. W. Fuller
Inventor.
By atty.
Wm. E. Earle

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

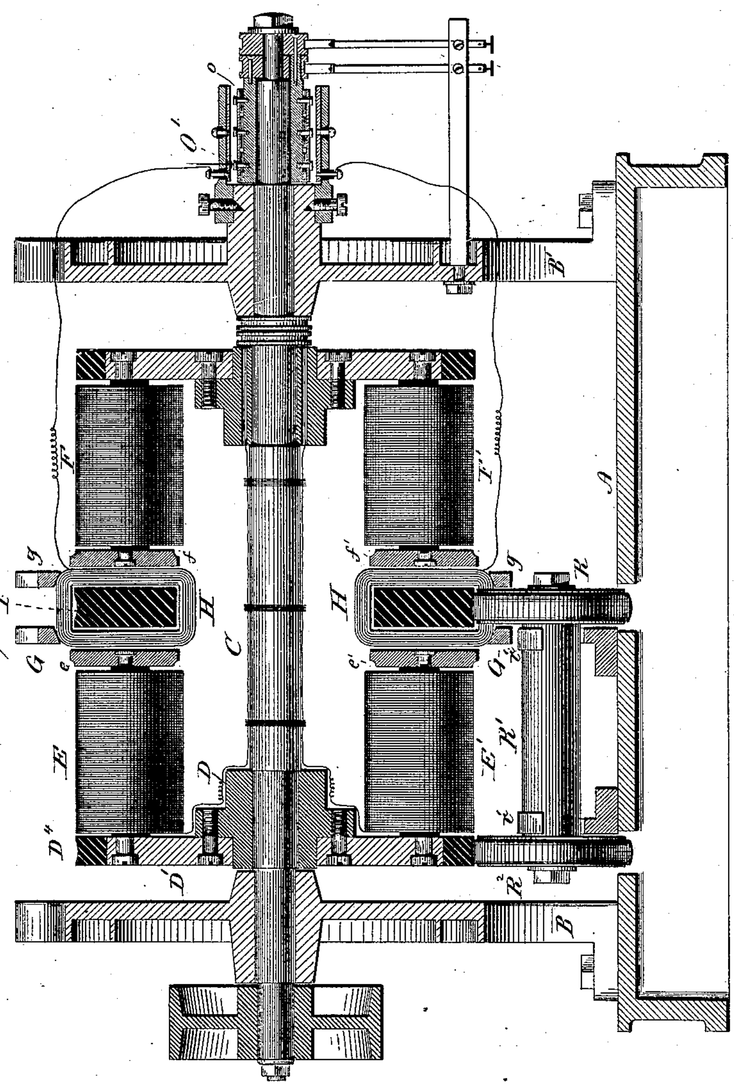
(No Model.) 4 Sheets—Sheet 2.

G. W. FULLER.

DYNAMO ELECTRIC MACHINE.

No. 278,122. Patented May 22, 1883.

Fig. 2.



Witnesses.
Edw. E. Quimby.
Jos. C. Earle

Geo. W. Fuller
Inventor.
By Atty.
John E. Earle

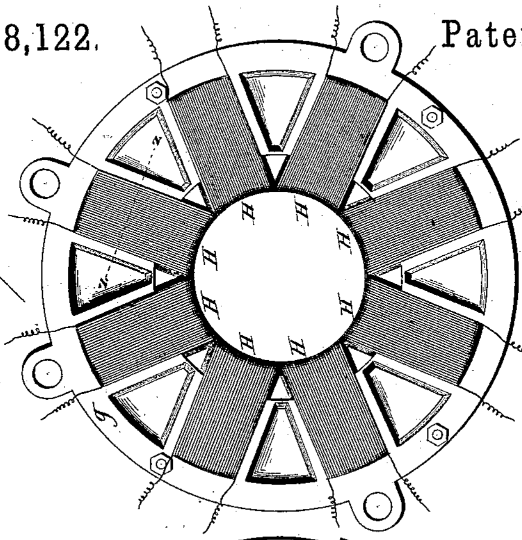
N. PETERS, Photo-Lithographer, Washington, D. C.

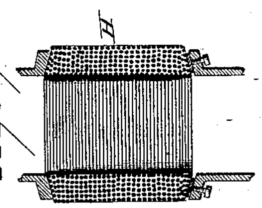
(No Model.) 4 Sheets—Sheet 3.

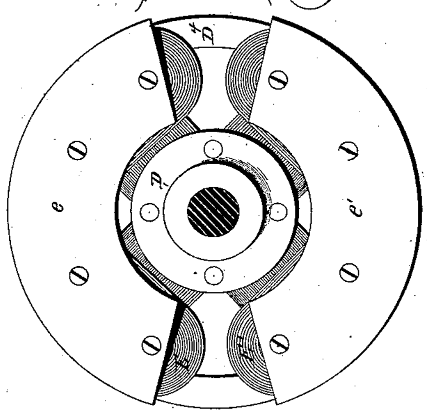
G. W. FULLER.

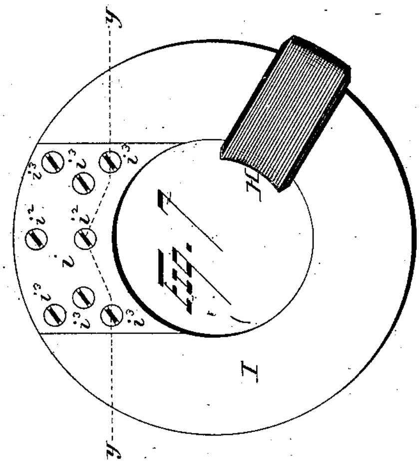
DYNAMO ELECTRIC MACHINE.

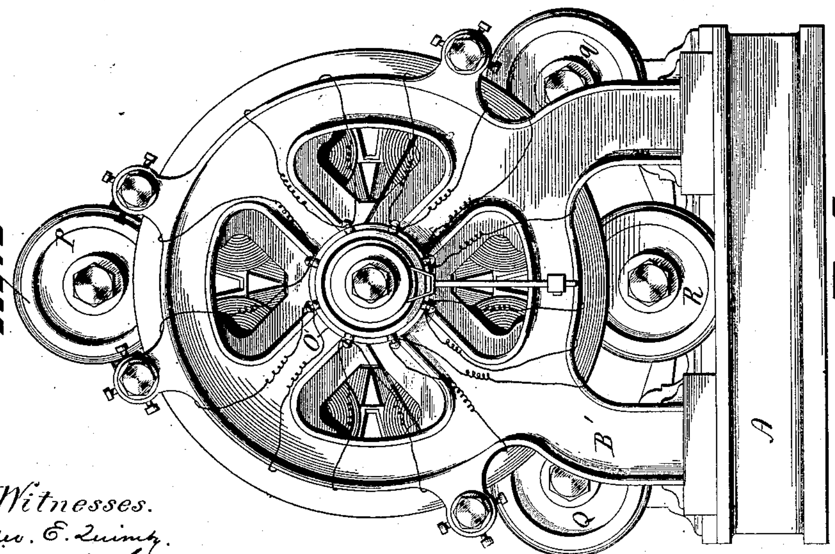
No. 278,122. Patented May 22, 1883.

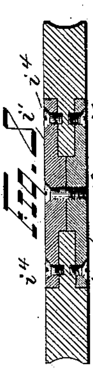












Witnesses.

Edw. E. Quimby

Geo. W. Fuller
Inventor
By atty.

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

(No Model.) 4 Sheets—Sheet 4.

G. W. FULLER.

DYNAMO ELECTRIC MACHINE.

No. 278,122. Patented May 22, 1883.

Fig. 12

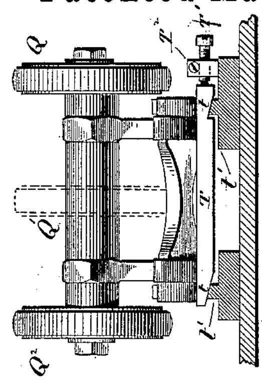


Fig. 4

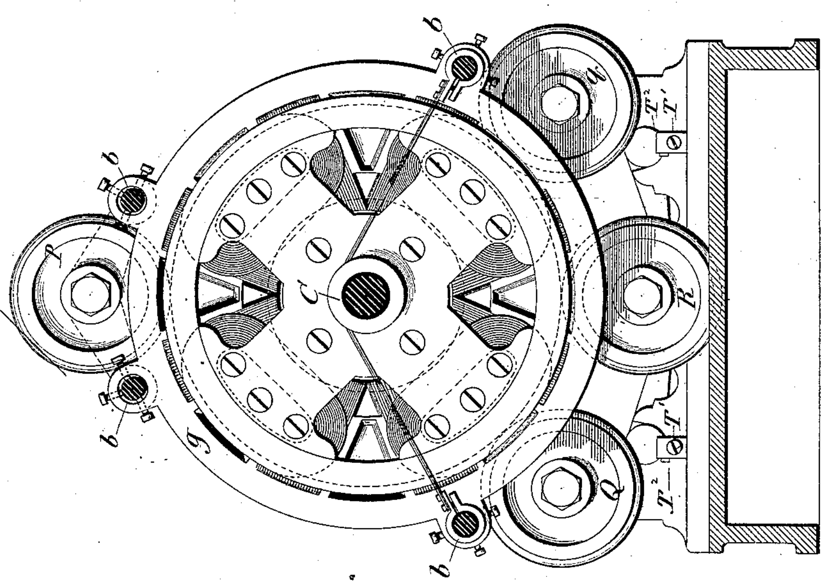


Fig. 11

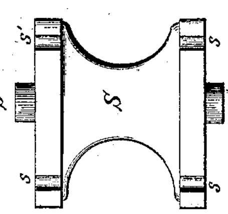
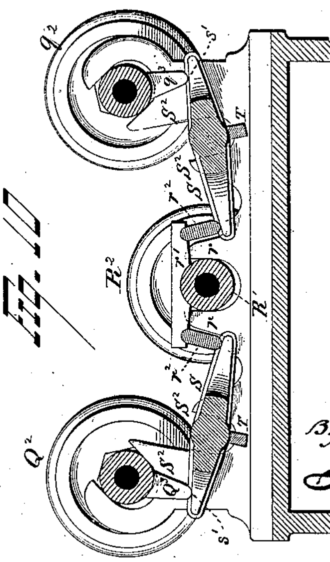


Fig. 10



Witnesses.
Edw. E. Quimby
Jos. C. Earle

Geo. W. Fuller
Inventor
By Atty.
John E. Earle

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

UNITED STATES PATENT OFFICE.

GEORGE W. FULLER, OF NORWICH, CONNECTICUT.

DYNAMO-ELECTRIC MACHINE.

SPECIFICATION forming part of Letters Patent No. 278,122, dated May 22, 1883.

Application filed February 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. FULLER, of Norwich, Connecticut, have invented a certain Improvement in Dynamo-Electric Machines, of which the following is a specification.

My improvements relate to certain modifications in dynamo-electric machines containing my invention of a floating armature-core which is independent of the coils surrounding it, and which, by reason of its capacity to rotate, is made to preserve unchanging polar relations to the field-magnets.

The machine described in the present case, which I designate "Case D," closely resembles a machine which I have described in another pending application designated "Case C," particularly as regards the feature that the floating armature-core is segmentally inclosed by a group of circumposed stationary armature-coils which are interposed between the poles of two parallel systems of rotating field-magnets, one half of both of which systems of one polarity are upon one side of the shaft, and are respectively united by common pole-pieces, while the other half upon the other side of the shaft are of opposite polarity, and are also respectively united by common pole-pieces. In the present case my floating core is an annulus composed entirely of soft iron or other magnetic material, which is supported and centralized by means of exteriorly-placed rollers which act upon its periphery through the spaces between the armature-coils. Several of these rollers are adjustable for the purpose of centralizing the core. A core thus constructed, being free to move, is rotated by the attraction of the rotating field-magnets; but I also provide for its rotation by mechanical power imparted by one or more positively-rotating friction-rollers bearing upon its periphery.

The accompanying drawings of a machine containing my invention are as follows:

Figure 1 is a side elevation. Fig. 2 is a central longitudinal vertical section. Fig. 3 is a front end elevation. Fig. 4 is a transverse vertical section through the line *x x* on Fig. 1. Fig. 5 is an elevation of one of the groups of field-magnets, showing the two pole-pins. Fig. 6 is a face view of the stationary armature-coils and the frame in which they are supported. Fig. 7 is a face view of the armature-core, showing one of the stationary coils by which it is inclosed, and the section of the core which is made removable for the purpose of slipping the stationary coils upon the core after they have been wound. Fig. 8 is a transverse section of the core, taken through the bent dotted line *y y* on Fig. 7. Fig. 9 is a section showing upon an enlarged scale the parts cut by the line *z z* on Fig. 6. Fig. 10 is an elevation, partly in section, of the supporting, driving, and centralizing rollers, and the adjustable cradles for regulating the elevations of the rollers. Fig. 11 is a top view of one of the adjustable cradles. Fig. 12 is an elevation, partly in section, showing one of the cradles supporting the bearings of the driving-rollers and the adjustable wedge for varying the elevation of the cradle.

Except in the particulars hereinafter set forth in detail, the machine represented in the drawings is the same as that shown and described in my pending application entitled "Case C," and, excepting as to the particulars referred to, does not therefore need especial description. It will be sufficient to remark that the machine has a substantial bed-plate, A, supporting the standards B B′, in which the shaft C of the machine has its bearings.

Mounted upon and rotating with the shaft C are two systems of field-magnets, E E E′ E′ and F F F′ F′. The opposed ends of the field-magnets are provided, respectively, with pole-pieces *e e′* and *f f′*. A stationary frame, G *g*, supports the circumposed armature-coils H between the pole-pieces of the rotating magnets.

The commutator composed of the strips O, fastened to the interior of the stationary commutator-cylinder O′, and the brushes affixed to the brush-holders mounted upon and rotated by the rotating shaft C, are the same as those shown in Case C, and the electrical connections of the machine are also the same as those shown and described in Case C.

The armature-core L is a flattened ring, which, like that of Case C, is independent of the stationary coils, which loosely inclose it segmentally, but in this instance is composed entirely of a paramagnetic material. It is constructed, however, with a removable section united to the principal section by tongued-and-grooved joints. The removable section may be conveniently composed of the shouldered plates i and i', secured to each other by the screws i^2 i^2, and respectively secured to the parts of the principal section, which they overlap, by the screws i^3 and i^4, as shown in Figs. 7 and 8.

The armature is provided upon its periphery with a shallow circumferential groove, I^2, for engaging the peripheries of the wheels or rollers by which it is centralized and supported or driven. Of these rollers the uppermost one, P, has its bearings in the box P′, supported by means of the eye-bars p p upon the upper pair of horizontal bolts, b, by which the standards B and B′ are connected. The shaft of the roller P has adjustable bearings, as in Case C.

The lower part of the groove I^2 in the core is engaged by the peripheries of the three driving-rollers Q, q, and R. The central driving-roller, R, is affixed to the end of a shaft which is inserted through the box R′, and has affixed to its opposite end the roller R^2, the periphery of which engages the circumferential groove D^4, formed in the periphery of the rotating magnet-disk D′, secured to the hub D, mounted upon and revolving with the shaft C. The driving-rollers Q and q are likewise respectively secured to shafts which pass through the boxes Q′ and q', and have affixed to their opposite ends the rollers Q^2 and q^2, which also engage the groove D^4 in the periphery of the disk D′. It will of course be understood that systems of toothed wheels may, if desired, be used in the place of the described system of rollers or friction-wheels, by which, as will be seen, power derived from the shaft C is transmitted from the rotating disk D′ and made to rotate the armature-core.

The boxes in which the shafts of the driving-rollers have their bearings are all movable. Thus the box R′ is contained between two parallel vertical jaws, in which it can slide up and down. The boxes Q′ and q' are contained in parallel jaws which are oppositely inclined toward the center of the machine. The boxes carrying the driving-rollers are thus provided with guide-bearings, in which, when they are being adjusted, they move in converging lines toward or from the axis of the rotating core.

It will be seen that the box R′ is guided in its movement up and down, when being adjusted, by the vertical jaws r r. To move it up and down it is provided with the cross-arms r' r', which are notched on their under sides, near the ends, to receive the rounded upper ends of the push-bars r^2, the lower rounded ends of which are seated in notches s, formed, respectively, in the tops of the cradles S S. The notches s s in each cradle are upon one side of its fulcrum, and similar notches, s' s', are formed in the top of each cradle, upon the opposite side of its fulcrum. The two cradles are alike in construction, and are provided at their ends, respectively, with cylindrical bosses S′ S′, which constitute their axes of oscillation.

The boxes Q′ and q' of the side rollers are provided with feet Q^3 q^3, the lower rounded ends of which are deposited in the notches s' in the tops of the cradles, respectively. The fulcra of the cradles are the tops of the wedge-bars T T, one of which is represented in elevation in Fig. 12, on reference to which figure it will be seen that the bar T is horizontal upon the top, and has two inclined faces, t t, upon its under side, which bear, respectively, upon the correspondingly-inclined tops of two standards, t' t', affixed to the bed of the machine.

The blunt end of the wedge-bar abuts against the horizontal set-screw T′, inserted laterally through the standard T^2. By turning in the set-screw T′ the top of the wedge-bar T is raised, thus raising the cradle resting upon it, and thereby forcing upward the friction-rollers with which the cradle is immediately connected. The bosses S′ S′ of the cradles are guided in paths inclined toward the axis of the rotating core, respectively, by the pairs of inclined parallel jaws S^2 S^2. (Shown in Figs. 4 and 11.) As each cradle is supported upon the top of an adjustable bar like that shown in Fig. 12, it will be seen that the rollers Q and q can be raised or lowered independently of each other, and that by raising one and lowering the other the core can be thrown over laterally in either direction, as may be required, to bring the peripheries of the driving-rollers Q, R, and q against the periphery of the core, or to centralize the core with relation to the interiors of the circumposed stationary coils. By this organization of driving-rollers the core is rotated by mechanical power and at the same speed as that of the rotating magnets. The core, however, will be rotated by the mere attractive force of the rotating field-magnets without the aid of mechanical power. If desired, therefore, the adjustable rollers Q, R, and q may be employed merely as supporting and centralizing rollers, in which case the rollers Q, R, and q will not be employed, and the ends of the shafts on which they are mounted may be provided with bearings against the under sides of adjustable half-boxes contained in suitably-inclined guides; or the rollers for centralizing and supporting the core may be mounted in a vertical plane transversely bisecting the middle of each cradle, as indicated in dotted lines in Fig. 12. In such case the cradles would require to be moved toward the front of the machine a sufficient distance to bring the middle of the cradles into the plane of the core.

It will be seen that the two cradles serve as equalizing-levers for equalizing the pressure of the rollers Q, R, and q upon the periphery of the armature-core. The weight of the armature resting directly upon the roller R is transmitted to the inner sides of the cradles or levers, which are thus depressed. The outer sides of the cradles, being correspondingly elevated, act upon the feet Q^3 q^3 and press the rollers Q q toward the axis of the core. Thus all three of the rollers, Q, R, and q, are made to do an equal amount of work in supporting or driving the armature-core.

I claim as my invention—

1. In a dynamo-electric machine in which

the field-magnets are rotated and the armature-coils are stationary, a suitably supported and centralized armature-core independent of the armature-coils, and one or more driving-wheels having a prescribed speed of rotation relatively to the speed of rotation of the field-magnets for mechanically rotating the armature-core.

2. In a dynamo-electric machine substantially such as described, employing a floating armature-core independent of the armature-coils, two or more rollers and adjusting devices for supporting the floating core and centralizing it relatively to the spaces within the armature-coils.

3. In a dynamo-electric machine substantially of the character described, mechanism for driving the armature-core, consisting of one or more suitably-supported shafts, such shaft, or each of such shafts, if there be more than one, being provided with two wheels, the one engaging the periphery of one of the rotating magnet-disks and being driven thereby, and the other engaging the periphery of the armature-core and imparting rotation thereto.

4. In a dynamo-electric machine substantially of the character described, in combination with the floating armature-core thereof, the mechanism for adjusting the rollers which support and centralize the armature-core, consisting of the cradles S S, provided with adjustable fulcra upon which they respectively rock, and acting upon one side of their fulcra, respectively, through the push-bars r^2 upon the arms r', and also acting upon the other sides of their fulcra, respectively, upon the feet Q^3 q^3, affixed to the boxes Q' q', as and for the purposes set forth.

5. In a dynamo-electric machine substantially of the character described, in combination with the floating armature-core thereof, the mechanism for equalizing the work of the rollers which support or drive the armature-core, consisting of the cradles S S, provided with adjustable fulcra upon which they respectively rock, each cradle, upon the inner side of its fulcrum, giving support to the box R' of the central roller, R, the two cradles acting, respectively, upon the outer sides of their fulcra to support the boxes Q' q' of the side rollers, Q q, and the guides for guiding the movements of the boxes Q', R', and q' in paths converging toward the center of the armature.

GEO. W. FULLER.

Witnesses:
JOS. C. EARLE,
J. H. SHUMWAY.