

(No Model.)

2 Sheets—Sheet 1.

C. J. VAN DEPOELE.

ACTUATING DEVICE FOR MOVING COMMUTATOR BRUSHES.

No. 461,297.

Patented Oct. 13, 1891.

Fig. 1.

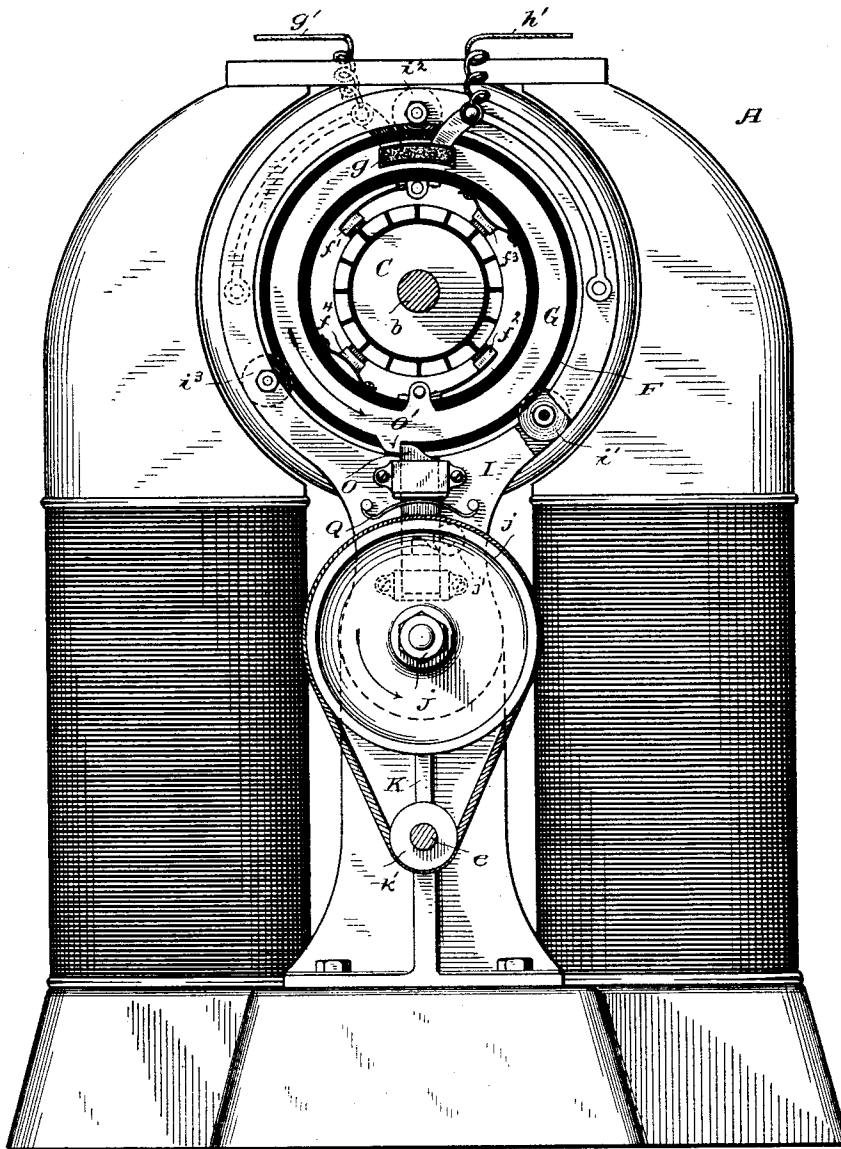
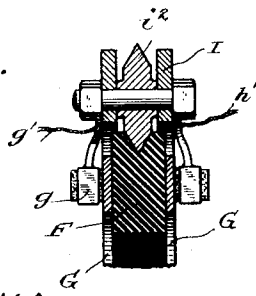


Fig. 2.



Witnesses

H. A. Lamb

Stephen James

Inventor

Charles J. VanDepoele

By

Frankland James

Attorney

C. J. VAN DEPOELE.
ACTUATING DEVICE FOR MOVING COMMUTATOR BRUSHES.
No. 461,297. Patented Oct. 13, 1891.

Fig. 3.

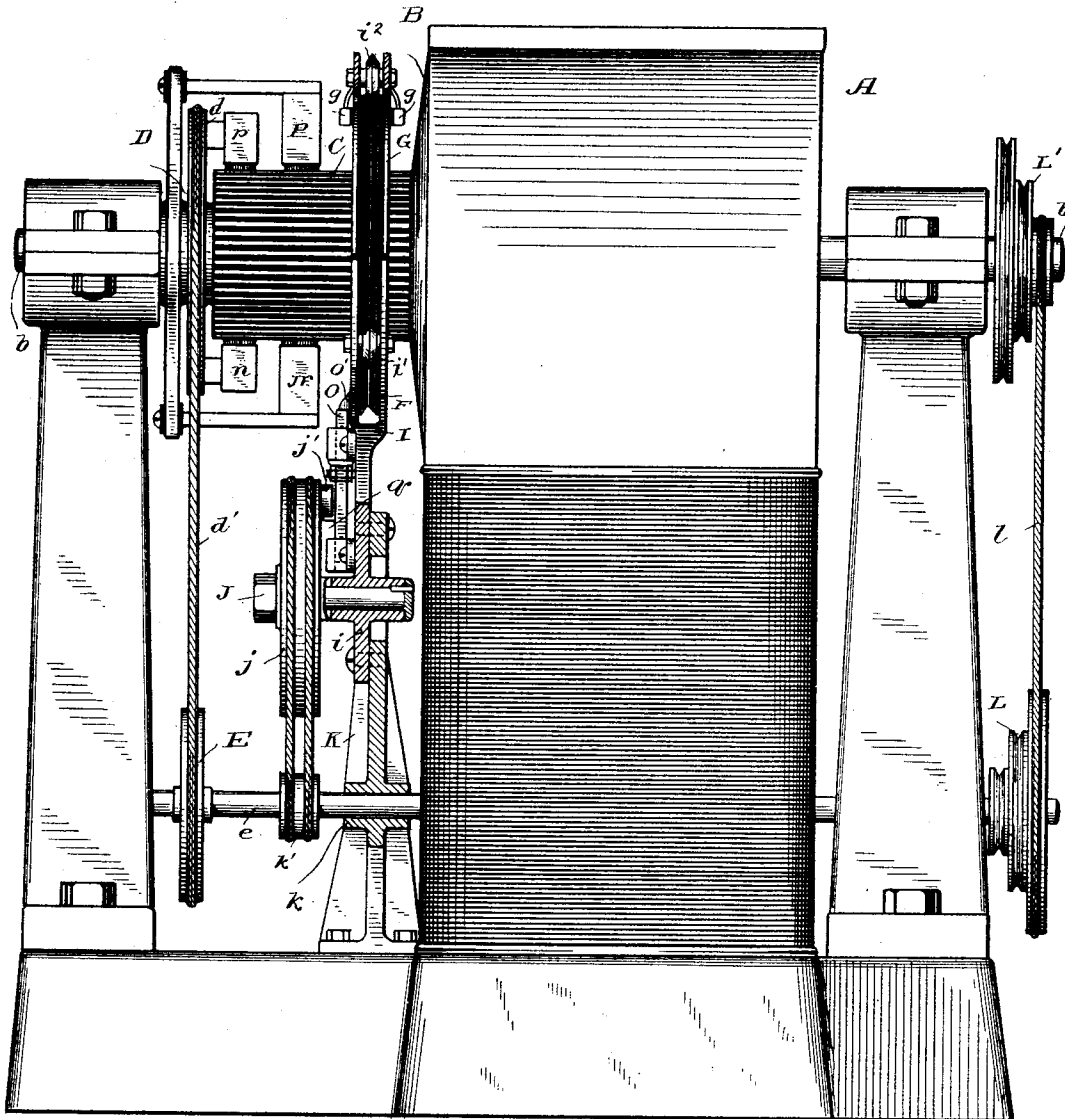
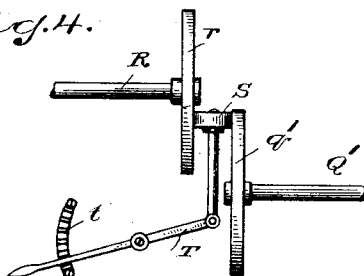


Fig. 4.



Witnesses
H. A. Lamb

Stephen Jannus

Inventor

Charles J. Van Depoele

By

Frankland Jannus

Attorney

UNITED STATES PATENT OFFICE.

CHARLES J. VAN DEPOELE, OF LYNN, MASSACHUSETTS.

ACTUATING DEVICE FOR MOVING COMMUTATOR-BRUSHES.

SPECIFICATION forming part of Letters Patent No. 461,297, dated October 13, 1891.

Application filed May 20, 1891. Serial No. 393,473. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. VAN DEPOELE, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Actuating Devices for Moving Commutator-Brushes, of which the following is a description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The present invention relates to means and mechanism for mounting auxiliary commutator-brushes in operative relation to the periphery of a commutator of a continuous-current machine, and also in means for imparting to said brushes the desired movements to enable them to produce pulsating currents having a defined rise and fall of the desired frequency and rapidity, and said currents may be alternating in character or flowing in the same direction, as required.

The general subject of moving auxiliary commutator-brushes for the purpose of affecting the character of a current or currents from a continuous-current machine is set forth in my patent, No. 422,855, dated March 4, 1890, and referred to also in numerous subsequent patents.

As set forth in Letters Patent No. 435,261, granted to me August 26, 1890, it is frequently desirable to impart to currents transmitted to special working circuits such a degree of independence as would be indicated by the term "spasmodic"—that is to say, that the currents for some purposes are required to be so rapid in their rise and fall or change in direction that the mechanism in question might be said to be operated by spasmodic currents, as distinguished from intermittent or pulsating currents. For instance, in an electric pump the current should reach its maximum at the earliest point of each stroke in order to produce the most powerful effect. While I have in said Letters Patent set forth and claimed means for producing a spasmodic action of the auxiliary commutator-brushes, I have in the present application shown what is believed to be the best mechanical means for accomplishing this object, which, in view of my said prior patent, I shall proceed to describe with particularity and to claim specifically, it being

understood that both forms of brush-moving mechanism—that is to say, the regular and the extra-rapid or spasmodic—may be employed in the same machine where it is desired to take off from the same commutator currents of different character.

The different features of the invention will be hereinafter set forth, and referred to in the appended claims.

In the drawings, Figure 1 is an end elevation of an electro-dynamic machine embodying the invention. Fig. 2 is an enlarged detail of the contact devices. Fig. 3 is a side elevation of the apparatus seen in Fig. 1, with additions thereto. Fig. 4 is a detail view of a modification of the speed-changing mechanism.

As indicated in the drawings, A is an electro-dynamic machine which has an armature B of the continuous-current type and a sectional commutator C.

P and N are the main positive and negative commutator-brushes, which, while stationary in operation, are of course adjustable upon the commutator C.

p n are a pair of auxiliary commutator-brushes, which are arranged to engage the commutator C and to be moved about the same with a steady regular motion toward and away from the main stationary brushes, and said brushes are mounted upon a suitable sleeve D, which carries a pulley d, which is connected by belt d' to a pulley E, carried by a shaft e, driven by connections with the armature-shaft, substantially as set forth in my patent, No. 422,857, dated March 4, 1890.

Although the speed of the brushes p n may be altered, still said brushes move in synchronism with the armature, whatever the rate. This arrangement is all that could be desired for various electric engines of the reciprocating type, in which a steady rise and fall of current is desirable; but there are instances in which it is desired to reverse the current or to change its flow from one circuit to another and to practically divide up the continuous current into pulsations which reach their maximum as quickly as possible and fall from maximum to zero with equal rapidity, for which purpose I find that a set of commutator-brushes which can be moved spasmodically about the commutator produce

the best results. Such an arrangement is here shown, and comprises, primarily, a ring of insulating material F, placed outside of and concentric with the commutator C. Upon the inner periphery of this ring are placed a number of contact-brushes, preferably of carbon, which perform the double function of collecting current and of providing a frictional bearing or connection for the ring F.

In the present instance four brushes are shown, two $f' f^2$ particularly adapted for collecting current, and two others $f^3 f^4$, which, although they might be used for transmitting current, are not connected in any working circuit, and therefore simply help to make mechanical contact between the ring F and the commutator. A pair of flat metallic rings G H are secured to and move with the ring F, and a pair of insulated contact-brushes $g g$ engage said rings and collect current therefrom, which current can be led off by suitable conductors $g' h'$, placed in electrical connection with said brushes. The outer periphery of the insulating-ring F may be rounded or flat, but is preferably grooved, and said ring is sustained by three or more guide rollers or pulleys $i' i^2$, which are sustained between the two sides of a light casting or other metallic frame I, which is made in circular form and envelops the exterior of the commutator carrying the guide-rollers which sustain the contact-carrying ring F. The frame I is formed with a downwardly-extending part i , which carries a casting J, upon which a belt-pulley j is journaled. The part i is adjustably fixed in a standard K, within which it can be raised or lowered to adjust it in correct position for machines of different size. The lower part of the standard K carries a journal k , in which is sustained the shaft e , which carries a pulley k' , which is belted to the pulley j . The axle e passes rearward between the legs of the field-magnets of the machine and is provided at its other extremity with changeable-speed belt-pulleys L, which are belted to a corresponding set of changeable-speed pulleys L' on the rear end of the armature-shaft b . By shifting the belt l the speed of the shaft e and connected parts may be varied. The base or shank i of the frame I carries a vertically-moving latch O, which is pressed upward by a suitable spring Q and arranged to be periodically depressed by a small friction-roller j' , carried by the pulley j and engaging a lug upon the latch O, thus serving to depress the latch with each rotation of the pulley j . The contact-ring G is provided with an extension or lug O', which engages the latch O, and is thereby retained in stationary position. The friction of the brushes $f' f^2 f^3 f^4$ upon the commutator is such that the insulating-ring F, together with the brushes and the rings G H, always tends to move in the direction of the rotation of the commutator, and when free will do so at high speed. Said contact devices are normally held stationary by the engagement of

the projection O', with the latch O. When the latch is depressed by the roller j' , the contact-carrying devices are released and the rings travel rapidly around with the commutator until a full revolution is made, when the projection O' catches the latch O and holds it until the roller j' moves around into position to again release it, thus making the motion of the brushes carried by the ring F dependent upon the rate of rotation of the pulley j , which, as before stated, can be made faster or slower, as desired. The brush-carrying devices may be moved only a part of a revolution at a time. This can readily be arranged by providing a plurality of the lugs O'. The regularly-moving brushes $p n$ may be used in combination with the spasmodically-moving brushes $f' f^2$ or not, as desired.

The invention is not limited to any particular form of variable-speed gearing, because it will be quite apparent that many known forms of mechanism of this description might be substituted for that which is herein shown with good results; but for the sake of illustration I have shown in Fig. 4 a simple form of changeable-speed gear which may be employed, if desired. In this figure the driving-shaft Q' is provided with a disk q' , the driven shaft R being provided with a similar disk r , and the two disks connected by a friction-roller S. The friction-roller S is sustained or carried by an arm connected with a lever T, which may be set in any one of a number of notches in a segmental rack t . Obviously, the speed of the driven shaft R will vary with the position of the friction-roller S, which latter can be placed as desired by means of the lever T.

Numerous other minor modifications and changes may be made in the hereinbefore-described invention without departing from the nature or scope thereof.

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

1. The combination, with a sectional commutator, of a contact-carrying device concentric therewith, frictional connections between the commutator and contact devices, a detent holding the contact-carrier, and means for periodically retracting the detent.

2. The combination of a sectional commutator, a concentric contact-carrying device provided with contacts engaging the commutator and adapted to connect the contact-carrier therewith, so that it will move with the commutator, a detent for arresting the movement of the contact-carrier, and means for retracting the detent at desired intervals.

3. The combination of a sectional commutator, a concentric rotatable contact-carrying device, contacts thereon engaging the commutator, a detent for arresting the rotation of the contact-carrying device, and means actuated by the armature-shaft for retracting the detent at a rate corresponding with the armature speed.

4. The combination, with a sectional commutator, of a concentric contact-carrying device comprising a base of insulating material, contact-brushes spring-supported upon said base and engaging the periphery of the commutator, contact-surfaces upon the insulated base, connections between said circuits and the brushes engaging the commutator, a stationary support for the contact-carrier, and current-collecting devices carried by the support and engaging the rings upon the contact-carrier.

5. The combination, with the commutator of an electro-dynamic machine, of a concentric commutator-brush holder comprising an insulating-base, with a plurality of contact-brushes secured thereto and engaging the commutator, two or more contact-surfaces in connection with the brushes, an exterior frame and support therefor, and guide-rollers carried by the frame and engaging and sustaining the brush-carrying devices.

6. The combination, with the commutator of an electro-dynamic machine, of a concentric commutator-brush holder comprising an insulating-base, with a plurality of contact-brushes secured thereto and engaging the commutator, two or more contact-surfaces in connection with the brushes, an exterior frame and support therefor, and guide-rollers carried by the frame and engaging and sustaining the brush-carrying devices, a detent carried by the frame and located so as to normally engage a projection upon the brush-

carrier, and means for retracting the detent at desired intervals.

7. The combination, with the commutator of an electro-dynamic machine, a concentric commutator-brush holder and brushes and contact-surfaces carried thereby, a driving-shaft, and variable-speed connections between said driving-shaft and the armature-shaft, of a vertically-adjustable frame inclosing the concentric commutator-brush carrier, sustaining the same in operative position, a detent upon the frame adapted to normally engage a lug upon the brush-carrier, and means actuated by the driving-shaft for periodically retracting the detent and liberating the brush-carrier, permitting the same to rotate with the commutator until again arrested by the detent.

8. In an electro-dynamic machine, the combination, with the commutator thereof and the main stationary commutator-brushes, of auxiliary brushes and contact devices therefor carried by a concentric brush-holder, said auxiliary brushes making a frictional contact and adapted to rotate their support about the commutator, a detent for arresting the rotation of the brush-holder, and means for retracting the detent at desired intervals.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES J. VAN DEPOELE.

Witnesses:

JOHN W. GIBBONEY,
FRANKLAND JANNUS.