

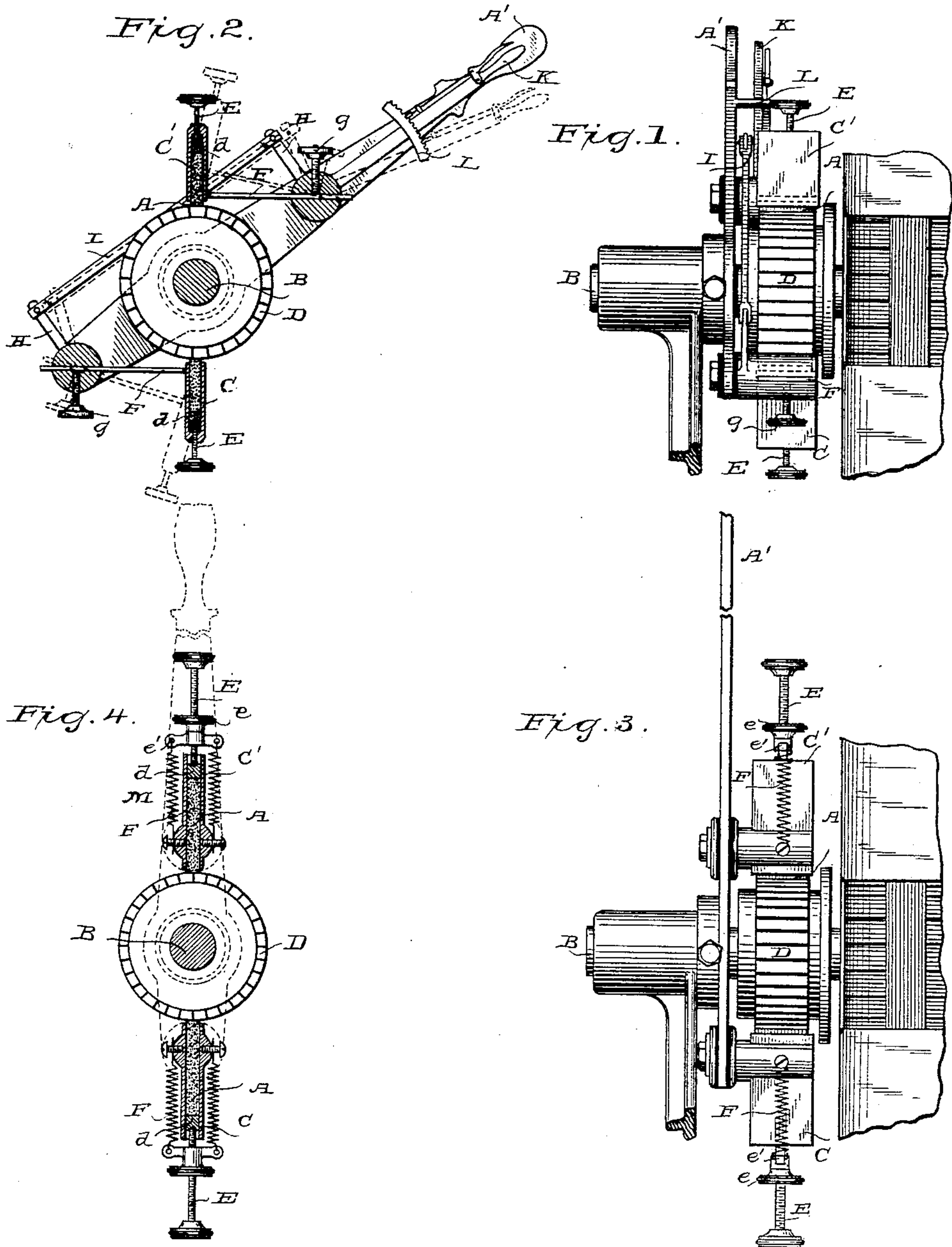
(No Model.)

C. J. VAN DEPOELE.

CARBON CONTACT OR COMMUTATOR BRUSH.

No. 390,921.

Patented Oct. 9, 1888.



Witnesses.

H. H. Lamb.  
Geo. W. Campbell.

Inventor.

Charles J. Van Depoele.

By his Attorney

Frankland James.



# UNITED STATES PATENT OFFICE.

CHARLES J. VAN DEPOELE, OF CHICAGO, ILLINOIS.

## CARBON CONTACT OR COMMUTATOR-BRUSH.

SPECIFICATION forming part of Letters Patent No. 390,921, dated October 9, 1888.

Application filed February 8, 1887. Renewed September 7, 1888. Serial No. 281,824. (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 Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carbon Contacts or Commu-  
tator-Brushes, of which the following is a specification, reference being had therein to the accompanying drawings.

The present invention relates to improvements in commutator-brushes or contacts for use with dynamo-electric generators and electro-dynamic motors.

In the operation of electric motors it is desirable for various reasons to use a thick brush or contact held by suitable mechanism in position tangential to the surface of the commutator—that is, projected endwise against it. In these positions the brushes may be moved around the commutator to any desired position without in the least affecting their mechanical relationship thereto, and it has been usual to use thick bunches of thin copper laminae secured together at their outer ends for this purpose; but I find in practice that the leaves of brushes so constructed will get into the interstices or separations between the sections of the commutator, by the rotation of which the leaves of which the brush is composed will be gradually bent outward and away from each other, and so in a short time rendered useless. This difficulty I have overcome by substituting for the copper contact-brushes heretofore used brushes or contacts of carbon or other non-homogeneous substance, which, being porous, will in a short time take up a quantity of copper-dust and form a smooth wearing-face that is extremely durable.

In the accompanying drawings I have shown the practical application of my invention, which will now be described.

Figure 1 is an elevation of the commutator and brush-holding devices, together with the immediately-surrounding parts of an electric motor. Fig. 2 is a sectional elevation showing the commutator, the armature-shaft, the commutator-brush-controlling devices, and carbon commutator-brushes in position therein. Fig. 3 is a view similar to Fig. 1, and shows the application of my present invention to the commutator-brush controlling and adjusting

devices now in use. Fig. 4 is a vertical section on the line 4 4 of Fig. 3.

Similar letters denote like parts throughout.

My improved brushes consist of plates or pieces of carbon shaped to fit loosely within the boxes or holders where they are placed, and then securely held in position against the commutator by the tension of suitable springs, to be referred to. The carbon brushes or contacts A may be of any desirable length or shape, according to circumstances, the particular shape and size or proportion herein shown being merely for the sake of illustration. The lower ends of the brushes should be formed or molded to fit the surface of the commutator, the subsequent wear being sufficient to retain the shape originally given.

To a hand-lever, A', journaled so as to be movable radially with respect to the armature-shaft B, are secured a pair of oblong flat boxes, C, which are arranged tangential to the commutator D and provided with plungers or followers d, fitting into the said boxes C and pressed upon by adjusting-screws E, working through the ends of the boxes C, where they are secured by jam-nuts e. From the sides of the boxes C project at right angles flat springs F, which are securely connected thereto. The free ends of said springs fit into slots f, formed in posts G, which are pivotally mounted in the hand-lever A' and suitably insulated therefrom. The posts G are each provided with a clamping-screw, g, by which the springs F are removably secured in position. The posts G are placed in diametrically-opposite positions with respect to the commutator. From each of the posts G, on the same side of the commutator, projects an arm, H, which arms are united by a link or connecting-rod, I. From the upper post G also projects a hand-lever, K, which may be in itself resilient, or is provided with a spring-latch arranged to engage with one or other of the notches in the quadrant L, attached to the lever A'.

With this construction it will be seen that by moving the lever K in the direction of the arrow the brushes will be moved from the commutator—a very important saving of wear and tear when, as is frequently the case in electric railways, long downgrades have to be traversed, during the descent of which the motor



is performing no useful work. By a simple return movement of the lever K the brushes are again brought into working position without their relative positions having been in any way altered. The brushes are moved about the commutator by means of the lever A.

In order to secure great nicety of adjustment of the pressure of the brushes upon the commutator, the teeth or notches on the quadrant L should be quite small; or, instead of teeth, an adjusting screw may be used, the result attained being practically the same.

In Figs. 3 and 4 I have shown the application of my present improvement to the commutator-brush-holding devices as constructed for use with brushes formed of copper laminae, and substantially as set forth in Letters Patent No. 291,650, granted to me January 8, 1884.

For the sake of clearness I will briefly describe what is shown in said figures. To the lever A' are rigidly secured flat boxes C'. The tops of these boxes are open and the followers therein are pressed upon by endwise-acting screws E, provided with jam-nuts e, as previously described. To the jam-nuts e, however, are secured extensions or ears e', to which are attached tension-springs M, by which the adjusting-screws and followers are constantly pressed against the brushes contained within the boxes C'. With this construction the brushes are constantly in contact with the commutator, and are only movable around the periphery thereof.

In order to reduce the resistance of the carbon brush to the minimum, the boxes C C' are brought down very close to the surface of the commutator, and should the small resistance then remaining be a disadvantage the brushes themselves can be plated with a good conductor, and all objections thus removed.

I do not limit myself to the use of carbon alone, as any non-homogeneous or porous hard conducting substance will answer the purpose and come within the scope of my invention.

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

1. The combination, with a commutator-cylinder formed of separated insulated segments, of commutator-brushes bearing upon the surfaces thereof and formed of carbon or other similar unyielding material, and of a width

greater than the distances between the commutator-segments, substantially as described. 55

2. The combination, with an electro dynamic motor, of commutator-brush boxes and radially-moving support therefor, carbon commutator-brushes free to move within said boxes, and a follower or followers for pressing the carbon brushes against the commutator, substantially as shown and described. 60

3. The combination, with a commutator of an electro-dynamic motor, of commutator-brush boxes arranged radially with respect thereto, circumferentially-moving supports therefor, resilient arms connecting the brush-boxes and their supports, and a link connecting said supports, whereby they may be rotated simultaneously in opposite directions and the brushes moved away from or toward the commutator, substantially as described. 65

4. The combination, with an electro-dynamic motor, of commutator-brush boxes, resilient arms attached to and extending from said boxes and being longitudinally adjustable in pivoted supports, connections between the said pivoted supports, whereby the said supports may be rotated simultaneously in opposite directions and the brush-boxes moved away from or toward the commutator, and a hand-lever connected to one of the pivotal supports, having a spring-detent, whereby the pressure of the brush-boxes upon the commutator-cylinder may be increased or diminished, as desired, substantially as described. 75

5. The combination, with an electro dynamic motor and the commutator-cylinder thereof, of an arm pivoted radially with respect thereto, rotating supports upon said arm, resilient arms projecting therethrough and longitudinally adjustable in said supports, commutator-brush boxes secured to the ends of said resilient arms, a link uniting said rotating supports, and a hand-lever secured to one of said supports, whereby the same may be rotated simultaneously in opposite directions and the brush-boxes moved away from or toward the commutator-cylinder, substantially as described. 80

In testimony whereof I affix my signature in presence of two witnesses. 100

CHARLES J. VAN DEPOELE.

Witnesses:

FRANKLAND JANNUS,  
H. A. LAMB.