

(No Model.)

J. C. HENRY.
MAGNETIC BRUSH HOLDER.

No. 532,782.

Patented Jan. 22, 1895.

Fig. 1,

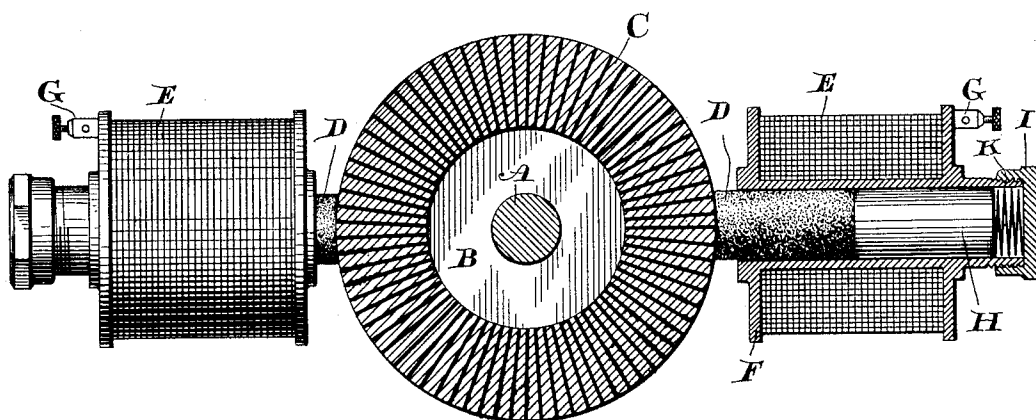
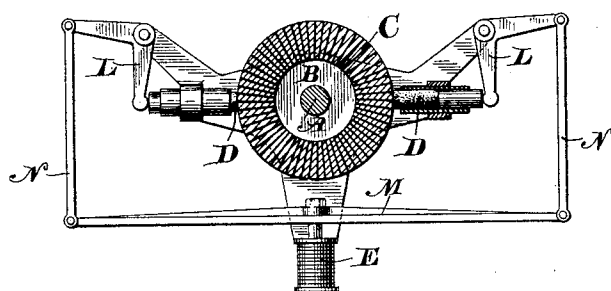


Fig. 2,



Witnesses:-

R. H. Haywood
J. Green

Inventor:-

John C. Henry, by
Geo. R. Blockquist,
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UNITED STATES PATENT OFFICE.

JOHN C. HENRY, OF WESTFIELD, NEW JERSEY.

MAGNETIC BRUSH-HOLDER.

SPECIFICATION forming part of Letters Patent No. 532,782, dated January 22, 1895.

Application filed December 11, 1894. Serial No. 531,476. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. HENRY, a citizen of the United States, residing at Westfield, in the county of Union, State of New Jersey, have invented certain new and useful Improvements in Magnetic Brush-Holders, of which the following is a specification.

My invention relates to brush holders for dynamo-electric machines or motors; and has for its object to construct a brush holder in which the pressure between the two parts of a moving contact, such as a current collecting device, shall be proportioned to the work being done by the motor or the current delivered by the generator; or in other words, to the transmitted current.

To attain these ends I actuate my brushes, in the form of holder which I prefer, by electro-magnetic means, giving a pressure proportioned to the current.

In the operation of dynamo-electric machinery and particularly of electric motors, it has been customary to press the brushes against the commutator only by spring pressure, and this independently of the amount of work being performed, or current delivered. This is objectionable, for although the conductivity is largely proportional to the pressure, and particularly so with carbon contacts, an excess of pressure where only small current is delivered acts to increase friction, to cut the commutator and wear out the brushes, and in the case of motors, particularly in street-car work, to make a disagreeable screeching noise, besides acting as a more or less efficient brake, and thus decreasing the commercial efficiency of the motor. To obviate these objections I make my brushes preferably of carbon, although this is not essential, and I press each of them against the commutator by a spring which is just sufficient to cause them to make contact. I also actuate them, either directly or indirectly by electro-magnetic means co-operating with the spring, as by a solenoid having a core which backs up the brush and presses it against the commutator, or by an electro-magnet of any suitable form and a system of levers or other gearing effecting the same purpose. Preferably, though not necessarily, the electro-magnetic arrangements are in series in the circuit and as the current increases, the solenoids act with

greater force and press the contacts more closely together, thus making them more efficient, while, when the work is light, contact is made with less pressure, and the wear of the commutator is correspondingly decreased, besides doing away with the disagreeable noise and other objections already pointed out.

My invention is illustrated in the accompanying drawings, in one of the forms which it may assume, wherein—

Figure 1 is a side elevation, partly in section, of an electro-magnetic arrangement of brush holders applied to a commutator. Fig. 2 is a modification showing how a single magnet may operate both brushes.

Referring by letter, A is the shaft of the motor or dynamo-electric machine.

B is the supporting disk or spider, and C is the commutator.

D, D are brushes, in the case illustrated, of carbon, though nothing in my invention limits me to this material.

E, E are solenoids of which H, H are cores, only one of these being shown, in the sectional view upon the right of the figure.

F, F are the casings or spools upon which the coils are wound, the casings being made preferably of copper or other non-magnetic metal.

G, G are the terminals of the line circuit. Any form of connection may be used, and forms no part of my invention.

K is a spring pressing against the solenoid core H and through it holding brush D against the commutator, and I is an adjusting cap or screw by which the pressure of the spring may be made just such an amount as will serve to carry the smallest current which the machine is adapted to deliver or utilize.

Referring now to Fig. 2, I illustrate substantially the same mechanism as in Fig. 1, except that a single solenoid E actuates, by means of a yoke M, levers N and bell-crank levers L, L, both of the brushes D, D. In this case the weight of the yoke M and the levers may be made just sufficient to give the brushes the amount of contact required, and this may be assisted or lessened by the use of bearings as counterbalances in any desired way.

The use and operation of my improved device will be readily understood from the foregoing description.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The method of effecting contact between the two parts of a current collecting device, which consists in causing the pressure of the contact to vary according to the variations of the transmitted current, substantially as described.

2. In combination, a current collecting device comprising a moving and a stationary part, and electro-magnetic means adapted to cause the two parts to engage with pressure proportioned to the transmitted current.

3. In combination, a current collecting device comprising a moving part and a stationary part, and an electro-magnet in the main circuit pressing the two parts together; whereby the pressure between the contacts is proportioned to the current transmitted.

4. In combination, a collector, brushes bearing upon the collector, and solenoids actuating the brushes, the solenoids being in the main circuit; whereby the pressure between

the two contacts is proportioned to the current transmitted.

5. In combination, a commutator, brushes engaging therewith, solenoids in the main circuit, and means connecting the solenoid with the brushes and adapted to press the brushes against the commutator with greater or less force according to the current transmitted.

6. In combination, a commutator, brushes engaging therewith, solenoids in the main circuit, cores for such solenoids, and adjustable springs pressing the cores against the brushes and thereby causing the brushes to engage the commutator with pressure proportioned to the smallest current transmitted between the two.

In witness whereof I have hereunto set my hand this 30th day of November, 1894.

JOHN C. HENRY.

Witnesses:

C. J. BASCOM,
M. M. FULLER.