

(No Model.)

A. J. SHAW.
COMMUTATOR BRUSH HOLDER.

No. 501,193.

Patented July 11, 1893.

Fig. 1.

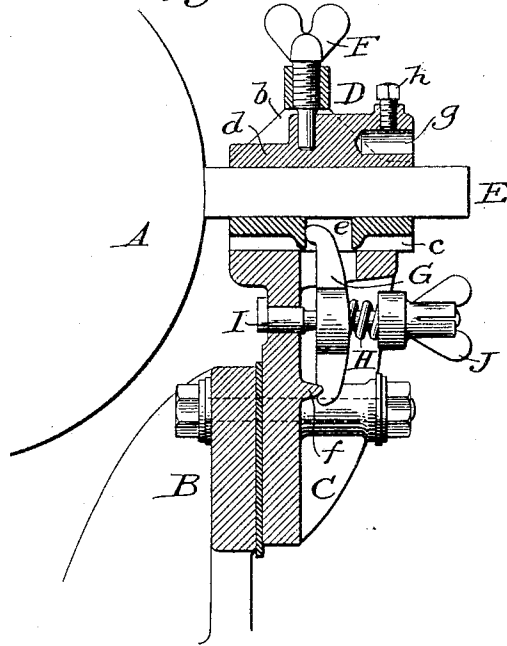
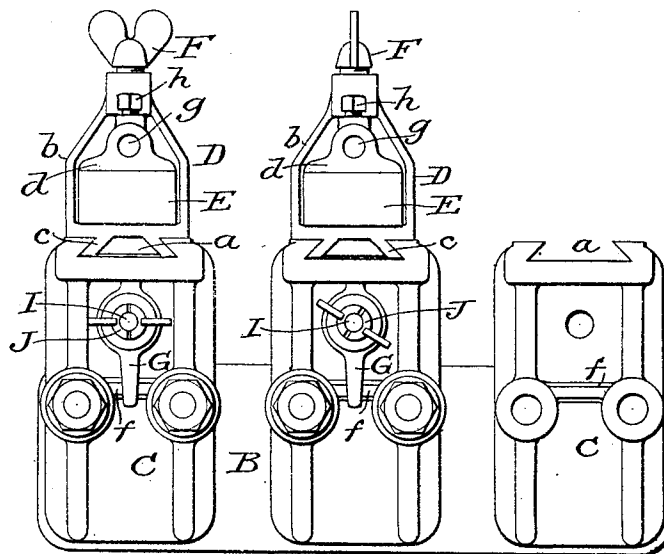


Fig. 2.



Witnesses:

James F. Duhamel.
Horace A. Dodge.

ALTON J. SHAW,
Inventor,

by Dodge Loun-
Atty.

UNITED STATES PATENT OFFICE.

ALTON J. SHAW, OF MUSKEGON, MICHIGAN.

COMMUTATOR-BRUSH HOLDER.

SPECIFICATION forming part of Letters Patent No. 501,193, dated July 11, 1893.

Application filed February 17, 1893. Serial No. 462,714. (No model.)

To all whom it may concern:

Be it known that I, ALTON J. SHAW, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Commutator-Brush Holders, of which the following is a specification.

My invention relates to an improved commutator-brush holder for dynamo electric machines and motors, and is designed to secure a uniform pressure and bearing of the brushes upon the commutator cylinder,—to permit the ready adjustment and renewal of brushes, and to prevent the accidental displacement of parts.

In the accompanying drawings,—Figure 1 is a sectional elevation of my improved brush holder; Fig. 2, a face or end view thereof.

It is desirable, both with dynamo electric generators and with electric motors, but particularly with reversible motors, to maintain a uniform position and pressure of the brushes upon the commutator cylinders, whether the armature rotate in one or the other direction. To attain this end it is found expedient to arrange the brushes radially to the axis of the commutator cylinder, and to provide for their movement radially to compensate for wear or effect of adjustment. Various constructions have been designed with these objects in view, and the broad idea of giving to the commutator brushes a radial position relative to the axis of the commutator cylinder and a right line movement in adjusting, is not new. By my improved construction, however, I obtain a strength and rigidity of parts, a freedom of movement, a uniformity of pressure, and a facility of adjustment and renewal of the brushes greater than hitherto attained, so far as I am aware.

The construction of my holder is illustrated in the annexed drawings, in which—

A indicates the commutator cylinder, shown merely in outline, and B an arm or standard suitably disposed to carry the brush holder.

C indicates a block or casting bolted to the arm or standard B and provided with a dovetail groove *a*, in which moves the brush carrier proper, D. As shown in Figs. 1 and 2, this carrier consists of an open block or frame *b*, provided with a dove-tail tongue or rib *c*

on its lower side to fit the groove *a* of the block or casting C; and a clamping block *d* by which the brush E is held and clamped upon the upper face of the opening in the frame *b* of carrier D. The block *d* is forced down upon the brush E by means of a pressure screw F, passing through a threaded opening in an elevated crossbar or yoke of the frame *b* of carrier D, as shown in Figs. 1 and 2. By turning the pressure screw F, the brush E may be firmly clamped, or may be loosened and made free to be removed from or adjusted in the carrier D, as may be required.

In the lower side of the carrier D there is formed an opening *e*, into which extends one end of a lever G, fulcrumed at or near its opposite end upon a rib or stud *f*, formed upon the block or casting C, as shown in Figs. 1 and 2. The lever G is held in place, and its free end is caused to bear against the inner end wall of the opening *e* by means of a spiral spring H, Fig. 1. This spring encircles a bolt or stem I, one end of which is seated and held against rotation in the block or casting C, and the opposite end of which is furnished with a thumb nut J. The stem or body of the bolt passes through a central opening in the lever G, and the spring H encircling it has its ends seated in recesses formed respectively in the back or outer face of the lever G, and in the inner end of the thumb nut J. By turning the thumb nut in one or the other direction the compression and the consequent pressure of spring H may be varied and regulated as required; and as the spring forces the lever G against the carrier D, the carrier and the brush clamped therein will be forced toward the commutator with whatever pressure may be required. The movement of the brush will be radial to the axis of the commutator by reason of the guidance of the carrier D in the dovetail groove or way of the block or casting C, the parts being so adjusted as to bring the axis of the brush radial to the axis of the commutator cylinder in the first instance.

As shown in Fig. 1, the tubular body of the thumb nut J is split through a considerable portion of its length, and prior to placing the nut upon the bolt I, the split portion is slightly compressed, so that when screwed upon the bolt the nut shall bear with suffi-

cient friction upon the rod to prevent its accidental turning by reason of vibration of the machine, or from like cause. This is a quite important provision, since the vibration is continuous and is considerable in amount, and unless special precaution be taken against it, the loosening of the nut is almost certain to occur. The wire or conductor for conveying the current to or from the machine, as the case may be, is inserted into a socket *g* in the clamping block *d*, and is there held by a binding screw *h*.

The clamping block may be made of copper, brass, or other good conductor, and the body of the carrier *D* may be made of like material, or of iron or other suitable substance. The block or casting *C* will be insulated from the arm or standard *B* by means of an interposed sheet of non-conducting material, and by washers and tubes applied to the fastening bolts, or in any equivalent manner.

The construction and arrangement above set forth permit a considerable play of the carrier *D* without appreciable variation in the pressure of the spring *H*, the movement of said spring being multiplied by the lever *G*. The device thus set forth is cheap, simple, strong and efficient, and in practice is found to answer very satisfactorily.

It will be observed that the free or moving end of lever *G* bears upon the sliding block or carrier *D* at a point directly in line with the guiding rib, so that there is no tendency whatever to twist, cramp or bind, which is a very important feature of construction. This result is attained too, without the necessity of placing the spring in line with and beyond the brush, which latter construction involves such prolongation or projection of the brush holder, as an entirety, as to render it very objectionable.

The bolt may be dispensed with and the outer end of the spring arranged to bear against a fixed abutment,—or in the socketed

end of an adjusting screw passing through a fixed abutment.

Having thus described my invention, what I claim is—

1. The herein described brush holder, consisting of the block or casting *C*, provided with groove *a*; carrier *D* comprising the open frame *b* with rib *c*, and the clamping plate *d* and screw *F*; lever *G*; bolt *I*; spring *H*; and nut *J*,—all combined and operating substantially as set forth.

2. In a brush holder, the combination of a supporting block or casting provided with ways, a carrier adapted to clamp a brush, and mounted and movable in said ways, a lever fulcrumed upon the block or support and having one end arranged to bear against the carrier, a spring bearing against said lever, and a bolt passing through the spring and provided with a nut by which to adjust the pressure of said spring.

3. In a brush holder, the combination of a supporting block or casting provided with ways, a carrier adapted to clamp a brush, and mounted and movable in said ways, a lever fulcrumed upon the block or support and having one end arranged to bear against the carrier, and a spring bearing against said lever.

4. In a brush holder such as described, the combination with a block or support, a carrier movable therein, a lever bearing upon said carrier, a spring bearing upon the lever, and a bolt,—of an adjusting nut screwing upon said bolt and serving to regulate the compression of the spring, said nut being split and thereby adapted to bear upon the bolt with an elastic pressure, substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand in the presence of two witnesses.

ALTON J. SHAW.

Witnesses:

L. N. KEATING,
ALTHEA A. WHIPPLE.