No. 735,375. PATENTED AUG. 4, 1903.

C. H. HINES.

COMMUTATOR BRUSH HOLDER.

APPLICATION FILED JAN. 30, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

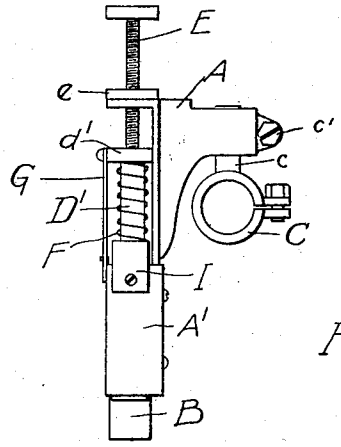


Fig. 1.

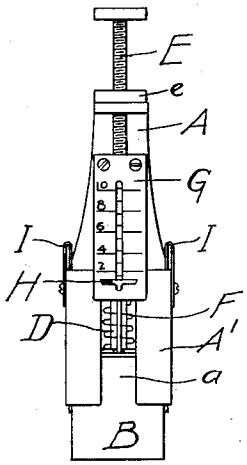


Fig. 2

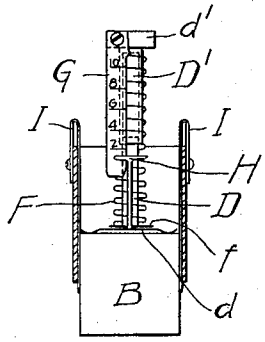


Fig. 3

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BY
Geo. H. Parmelee,
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

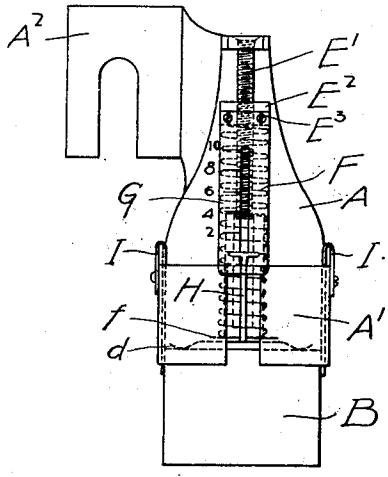


Fig. 4

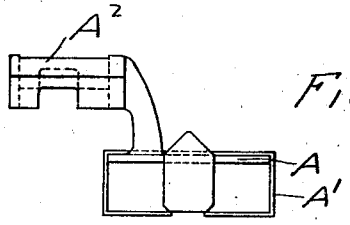


Fig. 5

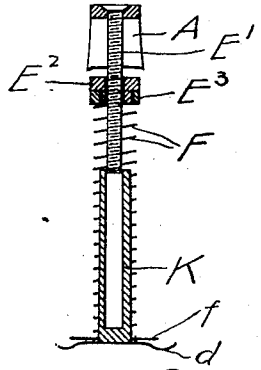


Fig. 6

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No. 735,375. Patented August 4, 1903.

UNITED STATES PATENT OFFICE.

CHARLES HENRY HINES, OF BUFFALO, NEW YORK.

COMMUTATOR-BRUSH HOLDER.

SPECIFICATION forming part of Letters Patent No. 735,375, dated August 4, 1903.

Application filed January 30, 1903. Serial No. 141,148. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HENRY HINES, of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Commutator-Brush Holders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention has relation to commutator-brush holders.

The objects of my invention are, mainly, as follows: first, to provide a brush-holder having means which will indicate the pressure of the brush on the commutator, so that by a simple inspection of the brush-holder this pressure can be determined; second, to provide means whereby the pressure on the brush may be adjusted as may be desired and may be maintained constant notwithstanding wear of the brush; third, to provide simple and convenient means for adjusting the brush to compensate for wear and by means of which the brush may be used for the greater part of its length before it is necessary to discard it; fourth, to provide means whereby the brushes may be readily removed and replaced, if necessary, and, fifth, to insure a good electrical contact between the brush and the holder.

With these objects in view my invention consists in the combination, with the holder-frame having a seat or guide for the brush, of a spring bearing upon the brush, a pressure-adjusting device for said spring, and a graduated scale and indicating device in connection therewith for indicating the pressure of the spring.

My invention also consists in the combination and arrangement of these parts in a manner to effect the third and fourth objects of my invention as above set forth; also, in novel contact devices between the brush and holder and in other novel features of construction, arrangement, and combination of parts, all substantially as hereinafter described, and pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of a brush-holder embodying my invention; Fig. 2, a front view of the same; Fig. 3, a detail view showing the arrangement of the pressure-spring, the indicating and the contact devices, the holder being shown in section and a portion of the graduated scale being broken off; Fig. 4, a front view showing a modified construction; Fig. 5, a plan view of the holder-frame shown in Fig. 4, and Fig. 6 a detail view of the pressure-adjusting device of the same.

Referring first to the construction shown in Figs. 1, 2, and 3 and which is more particularly adapted for stationary work, the letter A designates the holder-frame, having the holder portion proper, A′, for the brush B. This holder portion has the vertical slot *a* to enable the brush to be reached by the finger, and thus facilitate its insertion and removal. The entire frame A is carried on the stud *c* of a sleeve C, which is in turn secured on the usual brush-holding stud of the motor or dynamo, and by means of a screw *c′* the holder can be secured in any desired adjustment on the stud *c*. This gives an adjustment for wear independent of the spring adjustment, presently to be described, and also provides means whereby the holder can be quickly removed from the machine or raised any desired distance from the commutator.

D D′ represent a two-part telescoping spring-guide, the part D having a foot *d*, which bears against the upper end of the brush, and the part D′ having a head *d′*, which forms a bearing for the end of a tension-adjusting screw E, which is seated in an overhanging bearing of the holder-frame.

F is a coiled spring seated on the telescopic guide between the foot *d* and the head *d′*.

f is an insulating-washer for said spring to prevent it from taking current from the brush.

e is a lock or jam nut for securing the adjustment of the screw E.

G is a slotted graduated scale-plate secured to and carried by the head *d′*, and H is a pointer or indicator attached to the part D of the spring-guide and arranged to traverse said scale.

I represents elastic contact strips or clips secured to the holder A′ and bearing against the lateral edges of the brush B within the holder. These strips are of copper or other good conducting material and insure a good conductive connection between the brush and

the holder in lieu of the usual "pig-tail" secured to the brush.

The foot *d*, above referred to, is preferably a spring-strip bent, as shown, so as to transmit the pressure of the spring equally to both sides of the brush.

It will be readily understood that the screw E provides means for adjusting the spring so as to give any desired degree of pressure on the brush and that the value of this pressure is indicated on the scale G, which is carefully graduated. This feature enables all the brushes of a machine to be set at the same pressure, thus insuring uniform wear of the commutator and absence of sparking. As the brush wears the screw E may be adjusted to maintain the pressure constant. This adjustment, combined with the adjustment on the stud *c*, permits of a maximum wear of the brush. When necessary to remove and replace a brush, the entire holder can be removed from the stud *c* or the screw E may be loosened, the spring-guide, spring, and indicating device lifted out, and the brush then removed and replaced.

The construction shown in Figs. 4, 5, and 6 is modified for the requirements of street-railway motors. The holder A is formed with the slotted offset arm A^2 for engagement with the usual supporting stud or bolt. In lieu of the adjusting-screw E there is provided the fixed threaded stud E′, on which is a shouldered adjusting-nut E^2. This nut works against the top spring-bearing E^3, to which is secured the graduated scale G. The spring-guide K is bored out to telescopically engage the stud E′. The construction is otherwise the same as that shown in Figs. 1, 2, and 3. By turning the nut E^2 the pressure of the spring is regulated in the same manner as by turning the screw E in the construction first described.

I do not wish to be limited to the precise construction and combination of parts which I have herein shown and described, as it is obvious that various changes may be made therein without departing from the spirit and scope of my invention as it is defined in and by the following claims.

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

1. In a brush-holder, the combination with the guide for the brush, and a foot or follower arranged to bear upon the outer end of the brush, of a spring seated against the foot or follower, a pressure-adjusting device bearing against the opposite end of the spring, and a graduated scale arranged to measure and indicate the pressure exerted by said spring.

2. In a brush-holder, the combination with a tension-spring for the brush, and means for adjusting the tension thereof, of a pressure measuring and indicating device having one of its members carried by one of the spring-bearings.

3. The combination, in a brush-holder, of a movable brush, a spring bearing against the brush, a telescopic guide around which the spring is seated, means for adjusting the pressure of said spring, a graduated scale carried by one member of the said guide, and an indicating finger or pointer carried by the other member thereof.

4. In a commutator-brush holder, the combination of the slotted holder or guide for the brush, of the compression-spring, the two-part telescopic spring-guide, having end bearings for the spring, the pressure-adjusting device, and means for measuring and indicating the compression of the spring.

5. In a commutator-brush holder, the holder-frame having a bodily adjustment toward and away from the commutator, and having a seat for a brush, the compression-spring, its guide, a pressure-adjusting device for said spring, and a pressure measuring and indicating device therefor.

6. In a commutator-brush holder, the combination with the frame having a guide for the brush, of the two-part telescopic spring-guide removably held in said frame, the lower member of said guide having an extended spring-foot bearing upon the brush, and the upper member having a head thereon, a compression-spring seated on said guide, an adjusting-screw bearing against the said head, a graduated scale carried by the upper member of said guide, and a pointer or indicator carried by the lower member thereof and arranged to traverse said scale.

7. In a commutator-brush holder, the combination with the holder-frame having a guide for a brush, and an arm overhanging said guide, of a telescopic spring-guide, a spring seated thereon, an upper bearing for said spring, and an adjusting device supported by the overhanging arm, and a means for measuring and indicating the pressure exerted by the spring.

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

CHARLES HENRY HINES.

Witnesses:

CHAS. A. MCDONOUGH,

R. E. CALLAHAN.