(No Model.)

# I. H. BARTHOLOMEW.

## BRUSH HOLDER FOR COMMUTATORS FOR DYNAMO ELECTRIC MACHINES.

No. 466,972. Patented Jan. 12, 1892.

Fig. 1

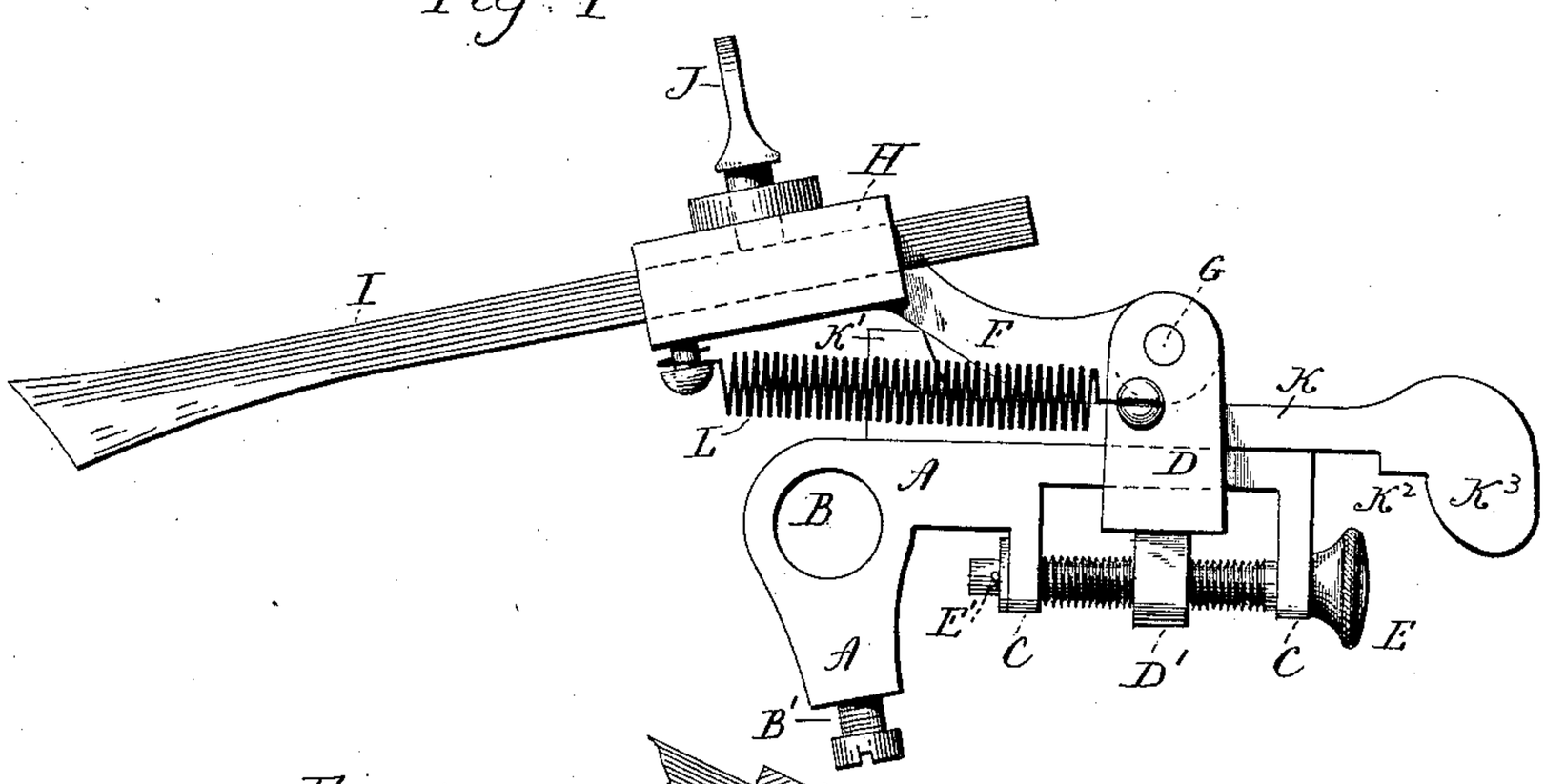



Fig. 3

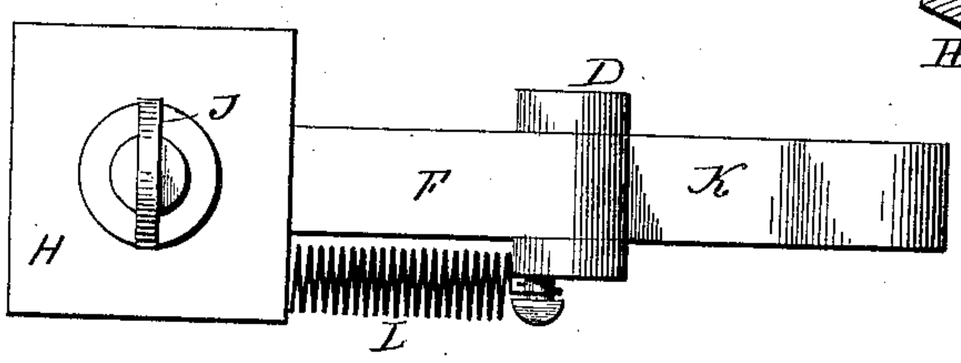



Fig. 2

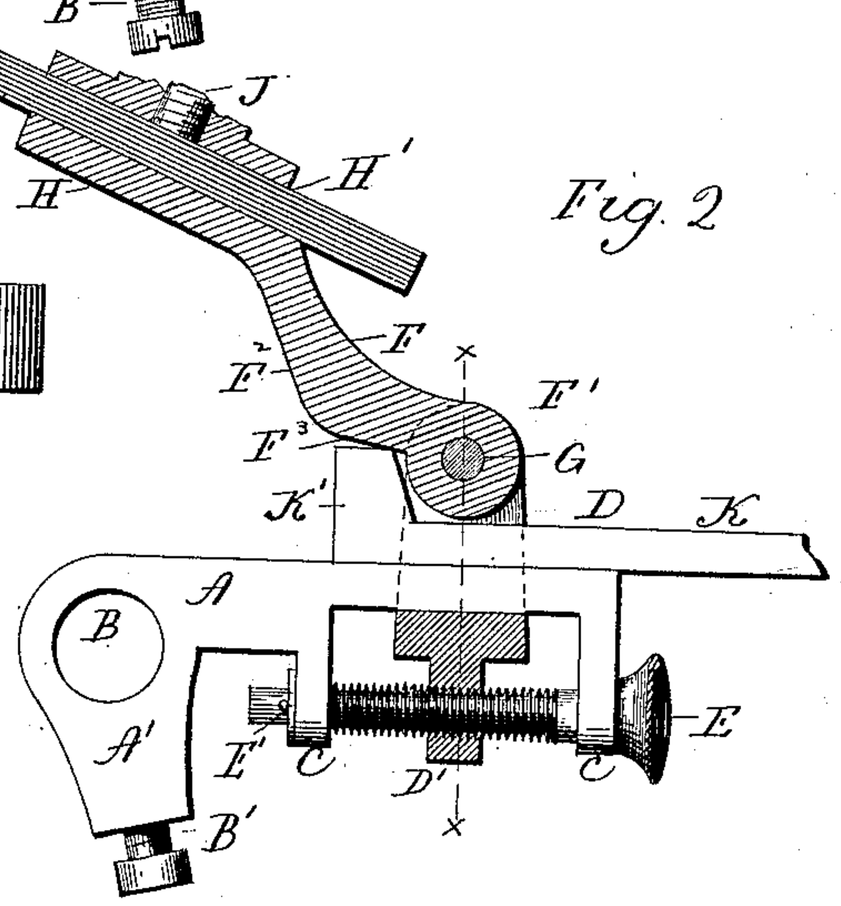
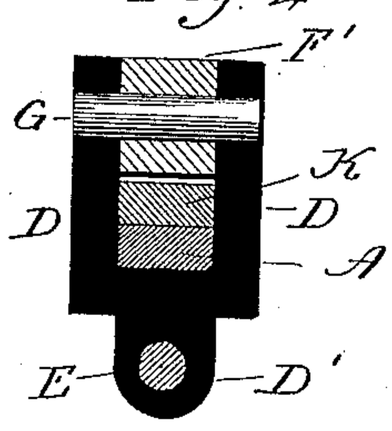



Fig. 4

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# UNITED STATES PATENT OFFICE.

ISAAC H. BARTHOLOMEW, OF NORTHFORD, CONNECTICUT.

## BRUSH-HOLDER FOR COMMUTATORS FOR DYNAMO-ELECTRIC MACHINES.

SPECIFICATION forming part of Letters Patent No. 466,972, dated January 12, 1892.

Application filed August 13, 1891. Serial No. 402,531. (No model.)

*To all whom it may concern:*

Be it known that I, ISAAC H. BARTHOLOMEW, of Northford, in the county of New Haven and State of Connecticut, have invented a new Improvement in Brush-Holders for Commutators for Dynamo-Electric Machines; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in side elevation of a brush-holder constructed in accordance with my invention with the brush shown in its normal or operating position; Fig. 2, a broken view of the device, which is shown partly in elevation and partly in section, with the brush-carrier elevated to retire the brush; Fig. 3, a plan view of the device; Fig. 4, a view of the device in transverse section on the line *x x* of Fig. 2.

My invention relates to an improvement in holders for commutator-brushes for dynamo-electric machines, the object being to produce a simple and convenient device adapted to be operated without the removal of any of its parts or the use of tools and to be adjusted to compensate the brushes for wear.

With these ends in view my invention consists in the combination, with a frame-piece, of a brush-carrier pivotally connected therewith and a movable hand-piece located between the said parts for lifting the former to retire the brush.

My invention further consists in the combination, with a frame-piece, of a slide applied thereto, a brush-carrier connected with the said slide, and an adjusting-screw mounted in the frame-piece and connected with the slide for moving the same and hence the brush-carrier.

My invention further consists in certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

As herein shown, the frame-piece A of the device is cast in one piece of metal and constructed at its forward end with an opening B for the shaft upon which the device is mounted, the said shaft not being shown herein. An arm A′, formed at the forward end of the frame-piece, is constructed with a longitudinal threaded perforation to receive a set-screw B′, which enters the opening B aforesaid to engage with the shaft and thus secure the device thereto. The said frame-piece is also constructed with two parallel depending lugs C C, having aligned perforations. A yoke-shaped slide D, applied to the said frame-piece between the two depending lugs C C thereof, is provided with a depending lug D′, having a threaded perforation in line with the perforations of the said lugs before mentioned. An adjusting-screw E, having a knurled head, passes through each of the said lugs, and is secured against endwise displacement by the said head and by a pin E′, passing transversely through its extreme inner end. By means of this screw the slide D may be moved back and forth between the two depending lugs C C, which are thereto sufficiently separated to give the slide as much play as will ever be called for in the operation of the device. The two ends of the yoke-shaped body of the slide extend above the flat upper face of the frame-piece and receive between them the curved arm F of the brush-carrier, the said arm being constructed at its rear end with a horizontally-perforated knuckle F′, receiving a pin G, which also passes through the said ends of the yoke-shaped body of the slide, whereby the brush-carrrier is pivotally connected therewith. A horizontal box H, located at the inner end of the arm F and cast in the same piece therewith, is constructed with a narrow opening H′, extending through it in line with the said arm and conforming to the cross-section of the brush I, which is composed of a series of thin flexible strips of sheet metal placed one upon the other, the said brush being secured in place in the box by means of a thumb-screw J, mounted in the upper wall thereof and entering the opening therein, so as to engage with the brush, which may be longitudinally adjusted by loosening it.

A movable hand-piece K, resting upon the flat upper face of the frame-piece A, is interposed between the same and the arm F of the brush-carrier and constructed at its inner end with a lifting-finger K′, which co-operates

with a cam-face $F^2$, formed upon the inner face of the said arm F, in lifting the arm into the position shown by Fig. 2 of the drawings, in which the brush is retired, or, in other words, cleared from engagement with the commutator, which is not shown. A shoulder $K^2$, formed upon the lower edge of the hand-piece, near the outer end thereof, is provided for engagement with the outer end of the frame-piece A, whereby the said hand-piece is prevented from being pushed too far inward. At its extreme outer end the hand-piece is flattened and turned down, as at $K^3$, to enable it to be more readily grasped for manipulation. The end of the lifting-finger K′ of the hand-piece has a flat face to co-operate with a corresponding face $F^3$, formed just in front of the knuckle F′ of the arm F of the brush-carrier, as will be hereinafter described. A coiled spring L connects the forward end of the box H with the slide D and exerts a constant tendency to hold the brush-carrier in its normal position, as shown by Fig. 1 of the drawings.

In using a brush-holder constructed in accordance with my invention it is first set in the usual manner, after which the brushes are moved toward or away from the commutator, as required, by means of the adjusting-screw, which enables this operation to be very easily and very delicately performed and the brush set to secure the very best results. This screw enables the adjustment of the brushes to be effected much more evenly and accurately than can be done by loosening the thumb-screw J and moving the brushes longitudinally in the box of the brush-carrier by hand. When it is desired to retire the brushes, or, in other words, to clear them from engagement with the commutator, the hand-piece is seized by its outer end and pulled back, whereby the brush-carrier is lifted against the tension of the spring L into the position shown by Fig. 2 of the drawings, in which it is sustained by the engagement of the flat edge of the lifting-finger K′ of the hand-piece with the flat face $F^3$, formed just in front of the knuckle F′ of the arm F of the box of the brush-carrier. When it is desired to re-engage the brushes with the commutator, the hand-piece is pushed inward, permitting the spring L to act in pulling the brush-carrier down, and so engaging the brushes with the commutator. The described operation of the hand-piece does not effect the adjustment of the parts and enables the brushes to be retired and brought into operative position very conveniently.

I would have it understood that I do not limit myself to the exact construction shown and described, but hold myself at liberty to make such departures therefrom as fairly fall within the spirit and scope of my invention. I am not, for instance, obliged to use the slide and the adjusting-screw in conjunction with the sliding hand-piece, but may use either or both of the said features.

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

1. In a holder for the commutator-brushes of dynamo-electrical machines, the combination, with a frame-piece, of a brush-carrier pivotally connected therewith, and a hand-piece located between the brush-carrier and the frame-piece for lifting the former to retire the brush, substantially as set forth.

2. In a brush-holder for commutator-brushes for dynamo-electric machines, the combination, with a frame-piece, of a brush-carrier pivotally connected therewith, and a sliding hand-piece resting upon the frame-piece and interposed between the same and the brush-carrier and constructed at its forward end with a lifting-finger, substantially as set forth.

3. In a holder for commutator-brushes for dynamo-electric machines, the combination, with a frame-piece, of a slide applied thereto, a brush-carrier connected with the said slide, and an adjusting-screw mounted in the frame-piece and connected with the slide for moving the same, and hence the brush-carrier, substantially as set forth.

4. In a holder for commutator-brushes for dynamo-electric machines, the combination, with a frame-piece having an opening to receive a shaft, and two depending parallel lugs having aligned perforations, of a yoke-shaped slide located between the said lugs and having a depending lug constructed with a threaded perforation, an adjusting-screw passing through the said lugs, a brush-carrier pivoted to the said slide, a sliding hand-piece located between the frame-piece and brush-carrier and having a lifting-finger at its inner end, and a spring for pulling the brush-carrier toward the frame-piece, substantially as set forth.

5. In a holder for commutator-brushes for dynamo-electric machines, the combination, with a frame-piece, of a brush-carrier pivotally connected therewith and having a cam-face and a flat face located in rear of the same, and a sliding hand-piece located between the brush-carrier and the frame-piece for lifting the former to retire the brush and constructed at its forward end with a lifting-finger, which co-operates with the said cam and flat faces, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ISAAC H. BARTHOLOMEW.

Witnesses:
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G. A. SMITH.