(No Model.)

J. R. COFFMAN.

BRUSH HOLDER.

No. 472,435. Patented Apr. 5, 1892.

Fig. 1.

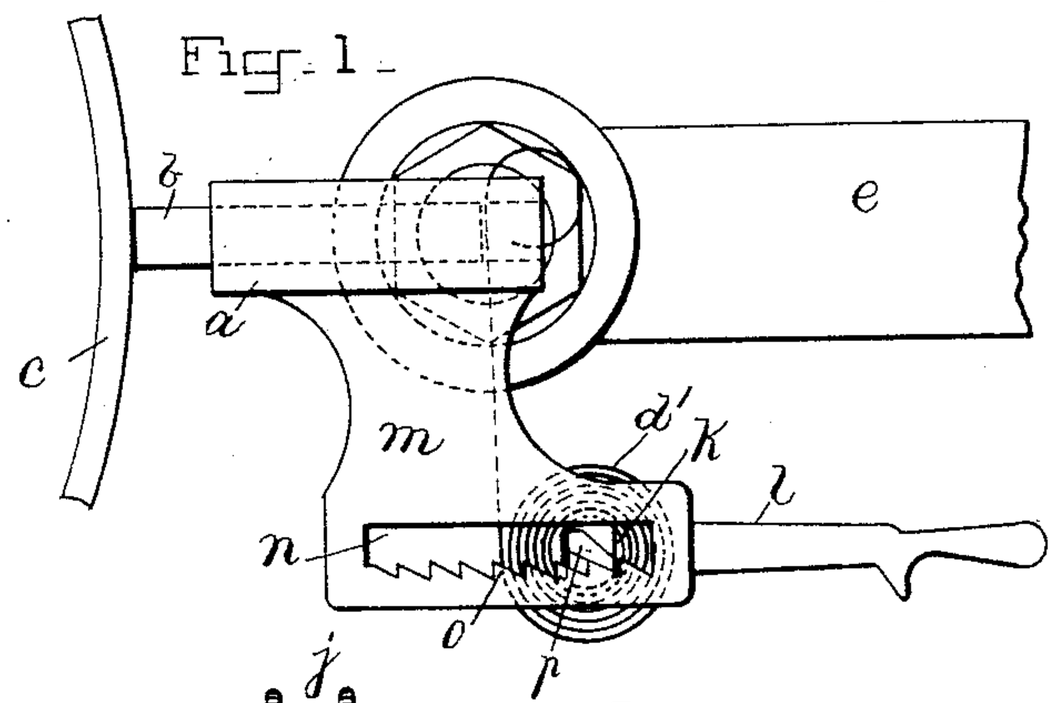


Fig. 2.

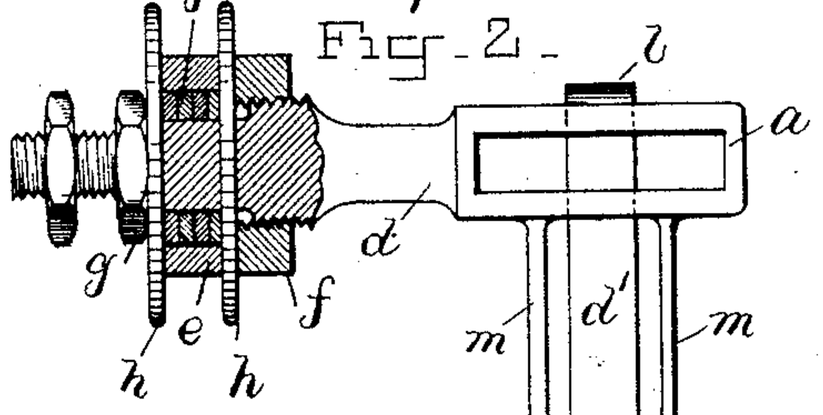


Fig. 4.

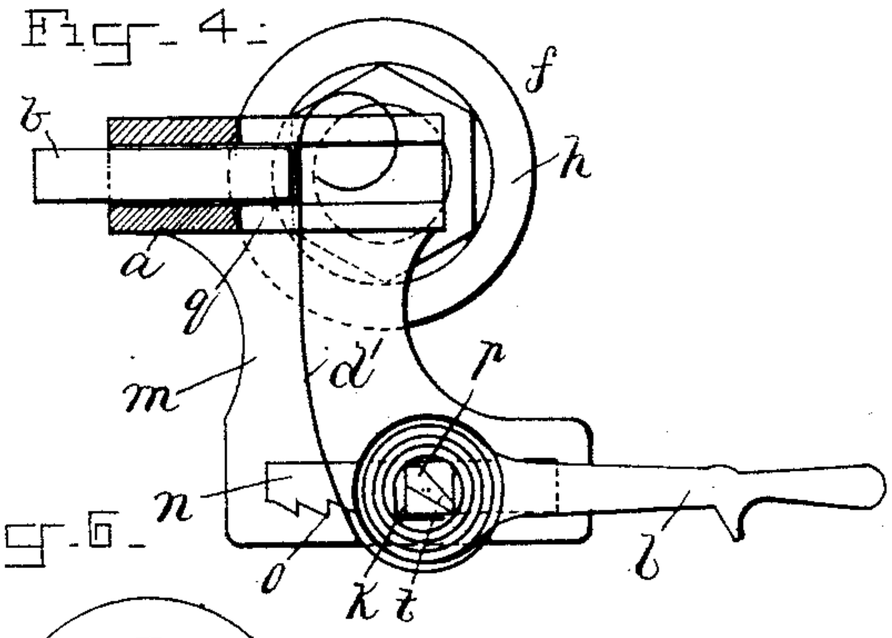


Fig. 5.

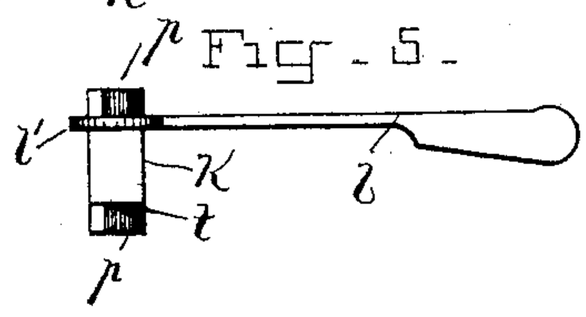


Fig. 6.

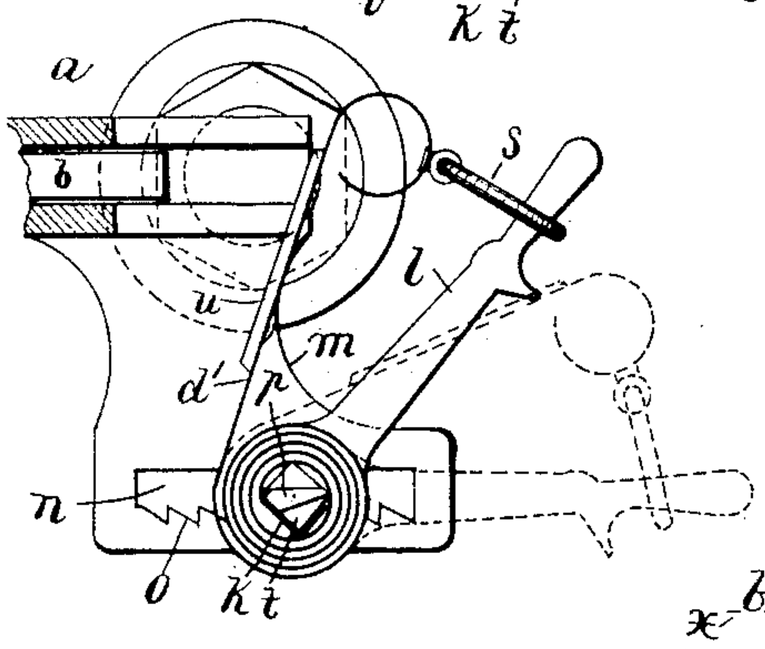
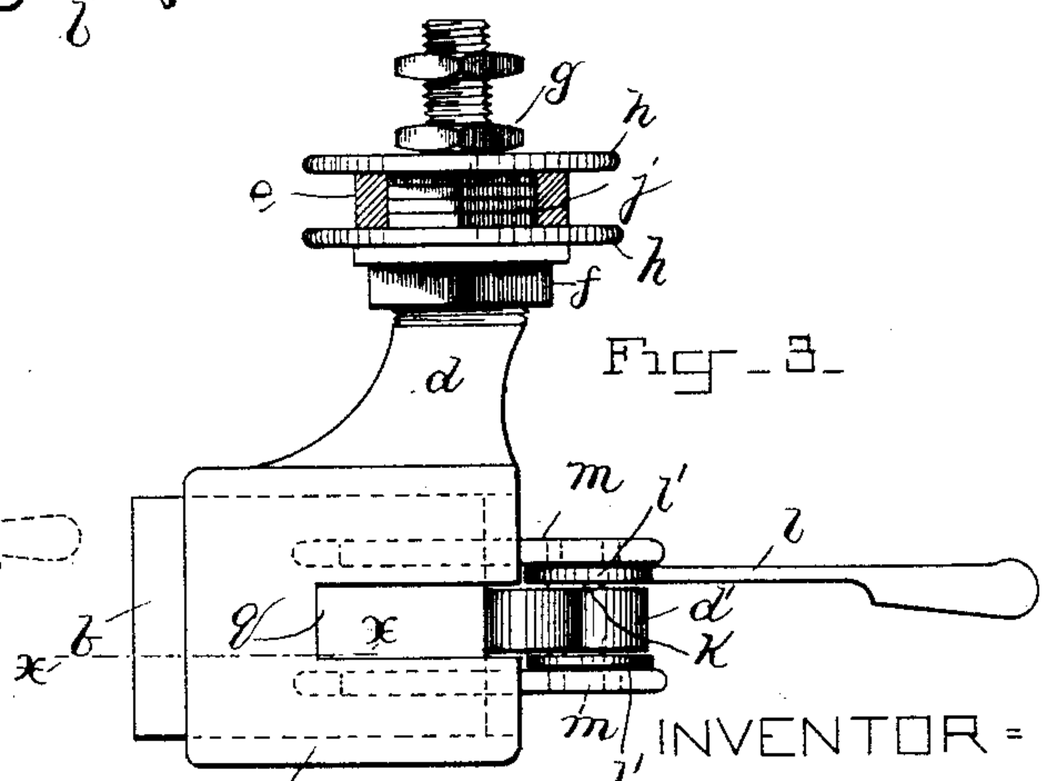


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOHN R. COFFMAN, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO C. A. BENTON, OF SAME PLACE.

BRUSH-HOLDER.

SPECIFICATION forming part of Letters Patent No. 472,435, dated April 5, 1892.

Application filed September 30, 1891. Serial No. 407,214. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. COFFMAN, a citizen of the United States, and a resident of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Brush-Holders, of which the following is a specification.

My invention relates to brush-holders for dynamo-electric machines and motors, and has for its object to provide more simple and efficient means of securing them effectually and adjustably with devices incapable of working loose and such as may be shifted for applying and removing the brushes, and also for adjusting them without tools and without having to fasten or unfasten any parts, and so as to maintain substantial uniformity of the pressure of the brush on the commutator, all as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved brush-holder and a part indicating the commutator of an electric machine. Fig. 2 is a front elevation of the holder with a part in section. Fig. 3 is a plan view. Fig. 4 is a sectional elevation on line *x x* of Fig. 3. Fig. 5 is a plan view of the spring-holder and adjusting-lever. Fig. 6 is a sectional elevation on line *x x*, Fig. 3, showing an attachment for holding the spring free of the brake.

I employ a brush-holding box or socket *a*, open at both ends, in which the brush *b* may be inserted from the back and projected at the front a suitable distance for making contact with the commutator *c* and be adjusted forward as it wears away on the commutator, said box or socket having a laterally-projecting supporting-arm *d* for mounting it in suitable relation to the commutator for enabling the brush to be held in contact therewith by a spring *d'*. In this case I represent said arm as secured to a part of the frame of the machine or bracket attached thereto, as *e*, by a part of the arm extended through an eye of the bracket and clamped to the sides of the bracket by the collar *f* and adjusting-nut *g*, screwing on the arm, suitably threaded for the purpose, with insulating-plates *h* between the collar and nut and bracket and also with the insulating-washers *j* in the eye of the bracket; but the means of mounting and insulating the said supporting-arm may of course be varied at will.

I mount the spring *d'*, employed to press the brush up to the commutator, on a holder consisting of a cross-head *k* of a lever *l*, arranged between two parallel laterally-projecting housings *m* from one side of the brush-holder, preferably the lower side, with the ends of said head entering slots *n* of the housing-plates, ranging parallel with the brush-holding block and having ratchet-notches *o* in the lower walls, said ends of the cross-head being formed in the shape of pawls *p* to engage in the ratchet-notches and lock the spring-holder anywhere along the notches against the thrust of the spring. The spring being fastened at the end to and several times coiled around the holder is then extended through the slot *q* in the brush-holding block, extending from the rear end forward a suitable distance for the range of the spring in pressing up the brush as it wears away.

It will now be seen from what has been said that by pressing the end of the spring bearing against the brush back out of the way the worn-out brush may be readily removed through the back end of the box and a new one put in, and the spring-holder may be set back in the ratchet at the beginning of the use of a new brush of full length and be set forward step by step in the ratchet as the brush wears short, and thus act with like tension on the brush during its whole service, and it will be noted that to shift the spring-holder requires only a slight push on the lever *l* in the direction of the brush. For shifting it the other way the lever has to be lifted a little at first to swing the pawls *p* up out of the notches, when the spring will force it back. Above and below the pawls *p* the angles of the cross-head forming the spring-holder are cut away at *t* to permit the holder to turn for raising the pawls out of the notches.

The brush-holding box and its attachments, as the slotted and notched spring-holder housings and the supporting-arm, are all produced in the casting, so that no fitting is required except the screw-threads for the collar and the check-nuts, and thus the holder is made very cheaply.

In Fig. 6 I represent the spring *d'* provided with a ring *s* to hook on the end of the lever

l and hold it free of the brush and brush-holder while changing the brush. The solid lines indicate the positions of the spring and lever in the act of connecting them, and the dotted lines show the positions they assume after being connected. In this example I represent the spring as reinforced with a stiffening-plate *u* in the part bearing against the brush, which it is desirable to use in some cases. Between the coil of the spring and the housings *m* guard-disks *l'* are provided to stay the coil and prevent wear against the housings, one of which disks may be a permanent part of the lever and cross-head and the other may be detachably applied.

I claim—

1. The combination, with the commutator-brush fixed movably in a slideway to be pressed against the commutator and the spring pressing the brush therein, of a holder for said spring, also fixed movably in a slideway toward the commutator, and means to adjust said holder and maintain substantial uniformity of pressure of the brush on the commutator by the spring, as set forth.

2. The combination, with the commutator and the brush, of the socket or box-holder for the brush, open at the back for receiving the brush and wherein the brush is adapted to slide to and from the commutator, a spring adapted to press the brush against the commutator, a holder for the spring, and the slotted and notched housings confining the spring-holder, said holder having the pawl ends and being adjustable along the confining-slots, substantially as described.

3. The combination, with the commutator and the brush, of the socket or box-holder for the brush, open at the back for receiving the brush and wherein the brush is adapted to slide to and from the commutator, a spring adapted to press the brush against the commutator, a holder for the spring, a lever attachment to the holder, and the slotted and notched housings confining the spring-holder, said holder having the pawl ends and being adjustable along the confining-slots, substantially as described.

4. The combination, with the commutator and the brush, of the socket or box-holder for the brush, open at the back for receiving the brush and wherein the brush is adapted to slide to and from the commutator, a spring adapted to press the brush against the commutator, a holder for the spring, a lever attachment to the holder, and the ring for connecting the spring and lever, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 20th day of June, 1891.

JOHN R. COFFMAN.

Witnesses:
F. W. PIELFORD,
A. B. REMEY.