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Patented Sept. 9, 1902.

W. J. RICHARDS.
COMMUTATOR BRUSH HOLDER.

(Application filed Jan. 20, 1902.)

(No Model.)

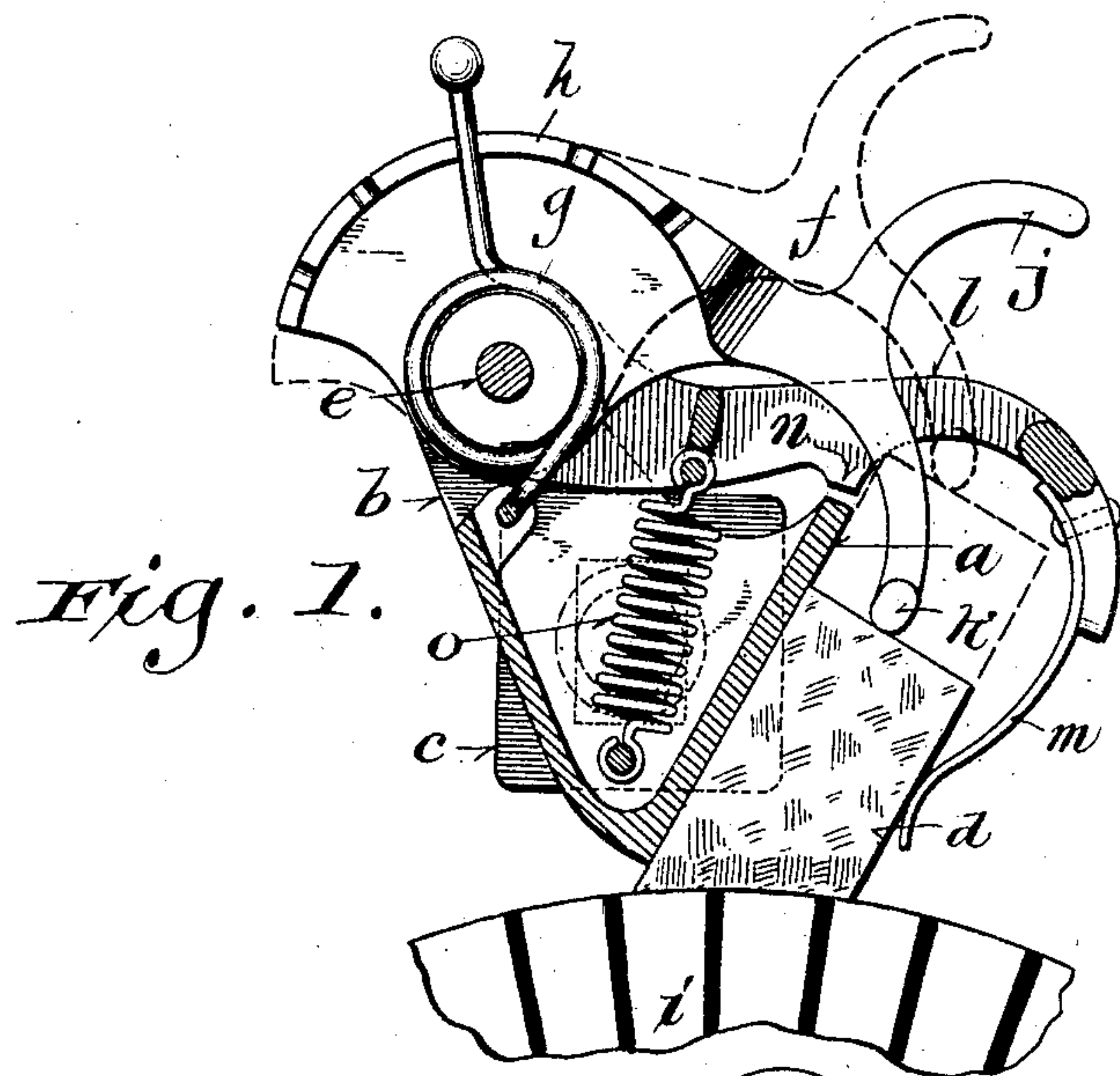
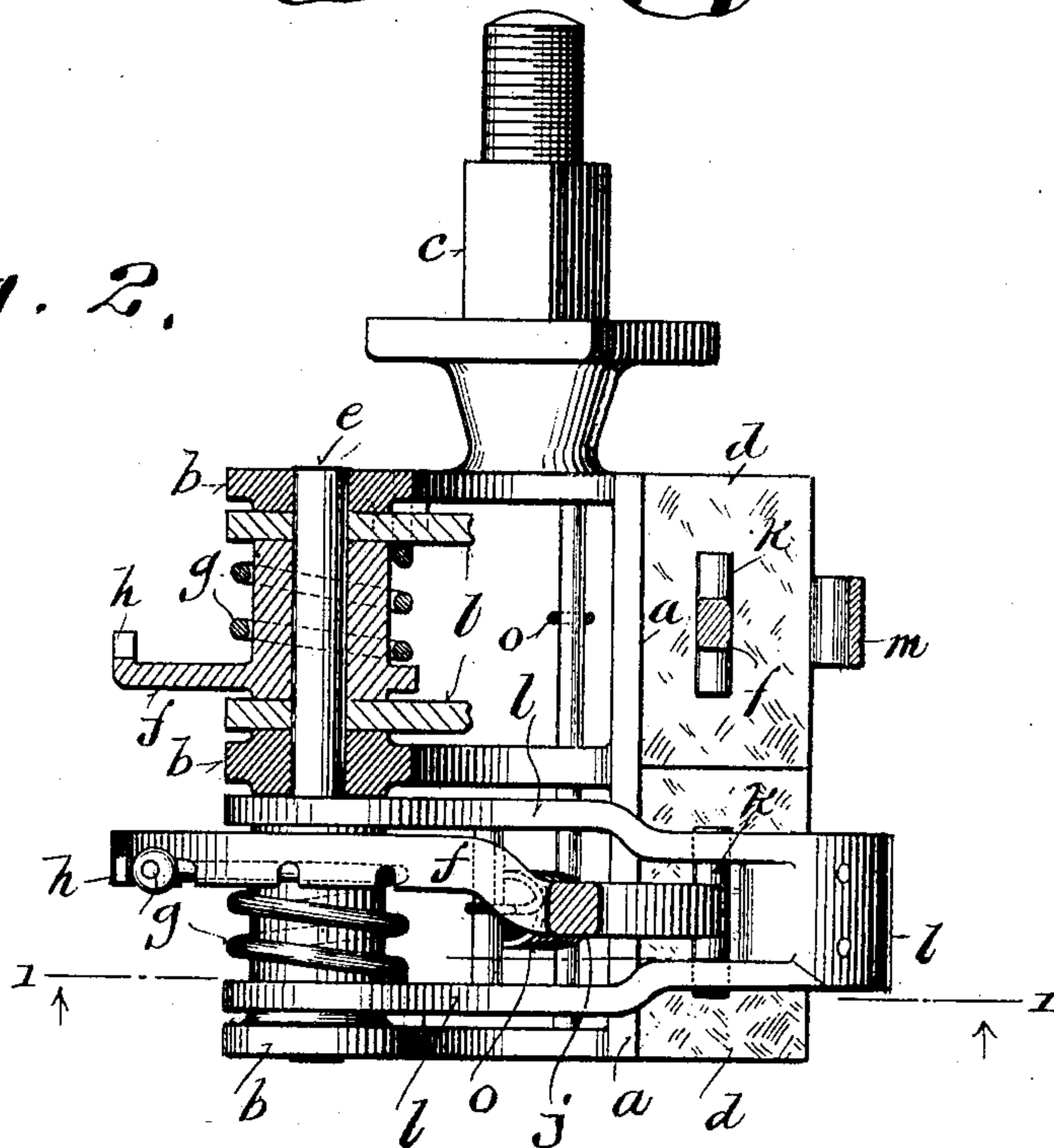


Fig. 2.



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COMMUTATOR-BRUSH HOLDER.

SPECIFICATION forming part of Letters Patent No. 708,664, dated September 9, 1902.

Application filed January 20, 1902. Serial No. 90,473. (No model.)

To all whom it may concern:

Be it known that I, WALTER J. RICHARDS, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Commutator-Brush Holders, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates particularly to holders for carbon or composition commutator-brushes for motors or dynamos. Its main objects are to provide for variations in the dimensions of such brushes, to insure good electrical contact between the brushes and commutator and between the brushes and holder, and to prevent play and chattering or jarring of the brushes in the holders and against the commutator.

It consists in certain novel features of construction and in the arrangement and combinations of parts hereinafter particularly described, and pointed out in the claims.

In the accompanying drawings like letters designate the same parts in both figures.

Figure 1 is a section on the line 1 1, Fig. 2, in a plane perpendicular to the axis of the commutator, of a brush-holder embodying the invention; and Fig. 2 is a partial plan view and section looking directly toward the outer ends of the brushes.

Carbon, composition, or non-metallic brushes unavoidably vary more or less in size, and consequently do not accurately fit into brush-holders, which are made in the form of a box or housing. If they are too large, they bind in the holder and do not feed freely toward the commutator. If they are too small, they jar or chatter, and as a result make imperfect electrical contact with the commutator and with the holder. It is the purpose of my improved device to avoid these objections and difficulties.

Referring to the accompanying drawings, *a* is a plain metallic contact and bearing plate, formed on the back with ears *b b* and at one side with a shank *c* for attaching the holder to the adjacent armature-bearing or other suitable support. For the purpose of illustration a holder for two brushes is shown; but it is obvious that the device may be constructed without any material change in the design for one or any desired number of brushes.

The brushes *d d* bear flatwise against and

are freely movable upon the plate *a*. Between each pair of ears *b* is pivoted on a transverse pin *e* an arm *f*, the free end of which when in working position is adapted to bear against the outer end of a brush *d*. A spring *g*, coiled around the hub of said arm and connected at one end with one of the ears *b* and engaged at the other end with a notched flange *h* on said arm, tends normally to press the brush endwise against the commutator *i*, as shown in Fig. 1. By engaging the outer end of this spring with different notches its tension may be varied to press the brush with more or less force, as desired, against the commutator and to increase the pressure as the brush is worn away and becomes shorter. Each arm *f* is formed with a finger-piece or handle *j* to facilitate turning it forward or back into or out of working position, and at its free bearing end it is formed with a cross-piece *k* for a purpose to be hereinafter explained. With each arm *f* another arm *l*, preferably forked to allow the arm *f* to pass freely through it, is pivoted on the same pin *e* at each end of the hub on the arm *f*, as shown in Fig. 2. Each arm *l* extends normally over the outer end of the plate *a* and is provided at its free end with a spring *m*, which when said arm is in working position, as shown in Fig. 1, is adapted to bear against the exposed side of the brush *d* and press and hold it flatwise against the plate *a*. The arms *l* may be formed with lugs *n*, arranged to engage with the outer edge of the plate *a* and prevent said arms from passing beyond a certain position toward the commutator when they are turned forward, as shown in Fig. 1, into working position. Springs *o o*, connecting the arms *l* with the holder to which they are pivoted, yieldingly hold said arms in working position and permit of their being turned back for the purpose of releasing and removing the brushes.

To remove or replace a brush, the arm *f* is turned back, and the cross-piece *k* thereon, engaging with the sides of the associated arm *l*, turns it back also, thereby clearing the outer end of the holder for the reception or removal of the brush. Both arms are held out of the way with one hand by means of the finger-piece or handle *j* and the cross-piece *k*, leaving the other hand free to withdraw, replace, or adjust the brush.

As the brushes wear and become shorter the

outer ends of the springs *g* are engaged with notches in the flanges *h* nearer the adjacent ends of said arms, thereby increasing or restoring the tension of said springs and the pressure of said arms against the outer ends of the brushes.

Any variation in the thickness of the brushes is allowed for by the swinging of the arms *l* on their pivots without affecting the tension of the springs *m*. The plate *a* having a plain contact-face, against which the brushes bear, variation in the width of the brushes will not affect their fit or working in the holder. If desired, the plate *a* may be formed at the sides with flanges to prevent displacement of the brushes, providing the flanges are located far enough apart to allow for variation in the width of the brushes and to avoid binding against them.

With this brush-holder the brush may be adjusted to work in a radial position with respect to the commutator, or it may be set, as shown in Fig. 1, at an inclination.

Various changes in minor details of construction may be made without departing from the spirit and intended scope of the invention.

I claim—

1. In a commutator-brush holder the combination of a bearing-plate, means for pressing the brush endwise against the commutator, an arm extending over the outer end of said plate and adapted to bear at its free end against the face of the brush opposite said plate and to hold the same against said plate, substantially as described.

2. In a commutator-brush holder the combination of a bearing-plate, a pivoted arm adapted to bear against the end of the brush, a spring tending to press said arm against the brush and the brush endwise against the commutator, and another arm extending over the outer end of said plate and provided with a spring adapted to press and hold said brush against said plate, substantially as described.

3. In a commutator-brush holder the combination of a plate against which one side of a brush is adapted to bear and slide, a pivoted arm adapted to bear against the outer end of the brush, a spring connected with said arm and adapted to press the brush endwise against the commutator, another movable arm extending normally over the outer end of said plate and bearing against the face of the brush opposite said plate, and a spring arranged to act on the latter arm and to hold the brush against said plate, substantially as described.

4. In a commutator-brush holder the combination with a bearing-plate, of a pivoted arm adapted to bear against the outer end of the brush, a spring acting on said arm and tending to press the brush endwise against the commutator, another pivoted arm extending normally over the outer end of said plate

and provided at its free end with a spring which is adapted to bear against the face of the brush opposite said plate, and a spring tending to hold the latter arm in working position, substantially as described.

5. In a commutator-brush holder the combination of a bearing-plate provided on the back with ears, an arm pivoted on a pin between said ears and adapted to bear against the outer end of the brush, a spring adapted to act upon said arm and press the brush against the commutator, another arm pivoted on the same pin and provided with a spring which is adapted to hold the brush flatwise with yielding pressure against said plate, and means for holding said arm in working position, substantially as described.

6. In a commutator-brush holder the combination with a bearing-plate, a pivoted arm adapted to bear against the outer end of the brush, a spring connected with said arm and adapted to press the brush against the commutator, another pivoted arm adapted to bear against the face of the brush opposite said plate, and a spring connected with the last-mentioned arm and adapted to hold the brush with yielding pressure against said plate and to permit said arm to be turned back out of the way for removing or replacing a brush in the holder, substantially as described.

7. In a commutator-brush holder the combination with a bearing-plate, of two arms pivoted concentrically with each other to said plate, one of said arms being adapted to bear against the outer end of the brush and the other arm being provided with a spring which is adapted to bear against the side of the brush opposite said plate, and springs tending to swing said arms toward said plate and to press the brush endwise against the commutator and flatwise against said plate, substantially as described.

8. In a commutator-brush holder the combination with a bearing-plate provided on the back with ears, arms pivoted together on a cross-pin between said ears, one of said arms being forked and provided at its free end with a spring which is arranged to bear against the face of the brush opposite said plate, and the other arm being adapted to pass loosely through the forked arm and bear against the outer end of the brush, a spring connected with the forked arm and tending to hold it in working position, and an adjustable spring connected with the other arm and tending to press the brush against the commutator, said arms being adapted to be turned back together out of the way for removing or replacing a brush, substantially as described.

In witness whereof I hereto affix my signature in presence of two witnesses.

WALTER J. RICHARDS.

Witnesses:

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ALICE E. GOSS.