

No. 747,890.

PATENTED DEC. 22, 1903.

J. F. McELROY.
BRUSH HOLDER FOR ELECTRICAL MACHINES.

APPLICATION FILED MAR. 5, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1

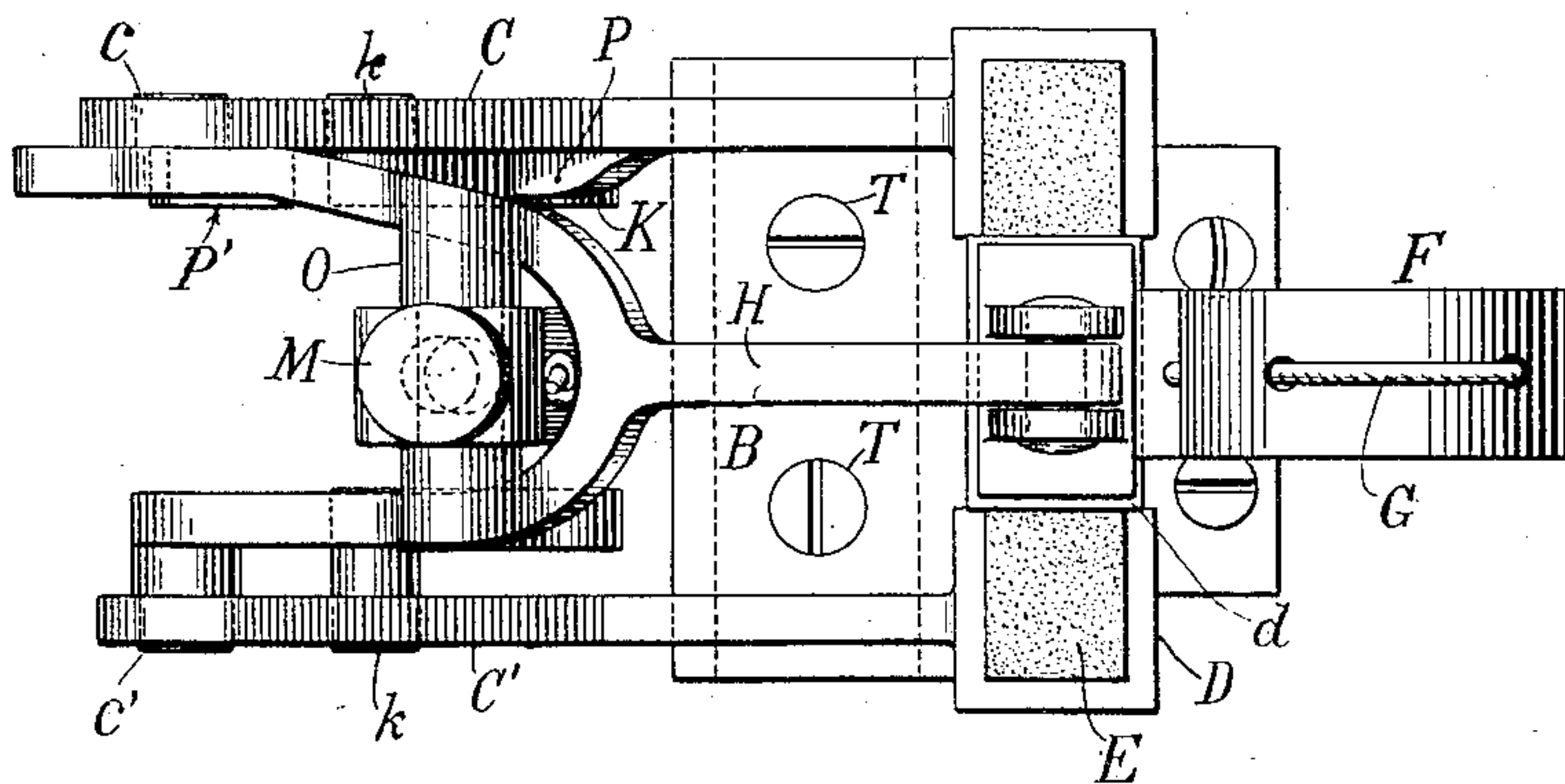


Fig. 2

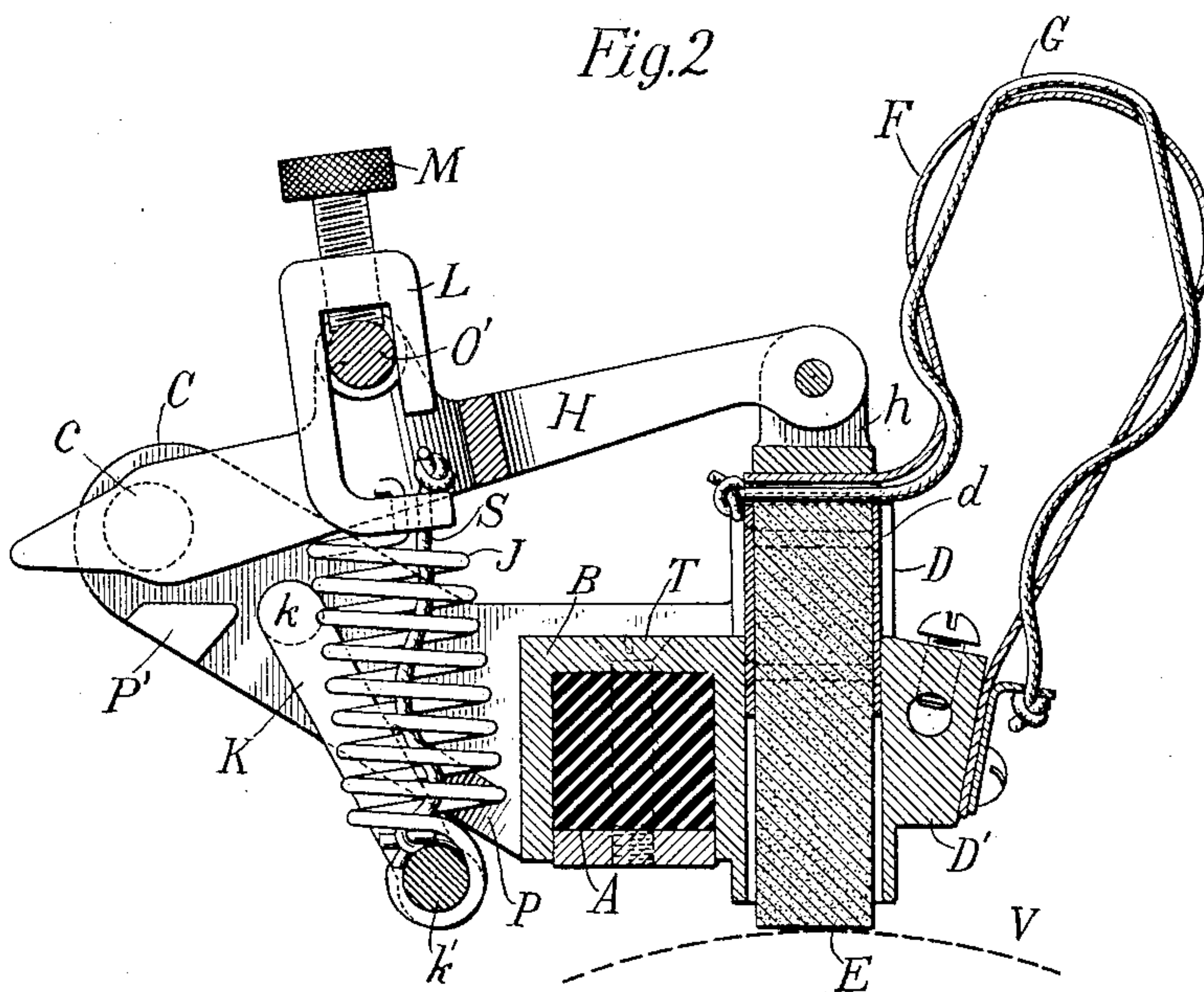
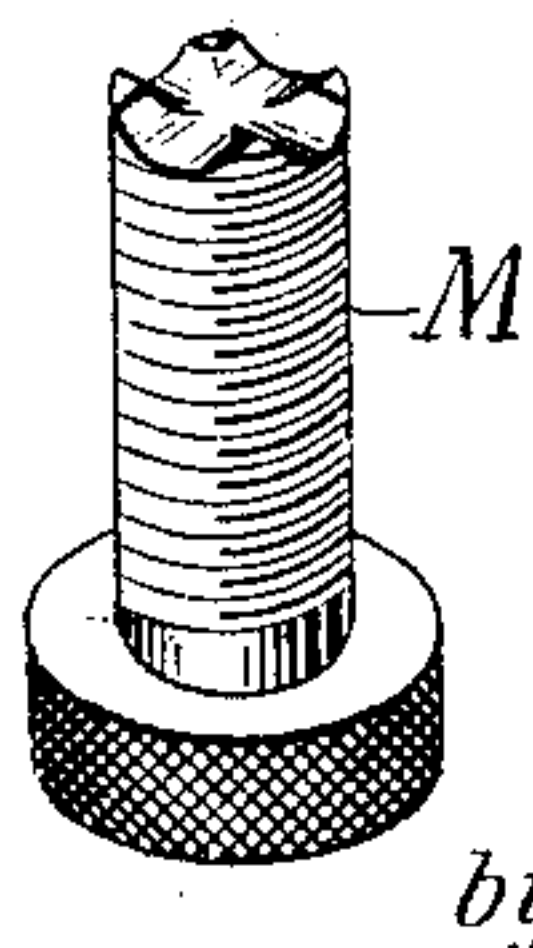


Fig. 3



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BRUSH HOLDER FOR ELECTRICAL MACHINES.

APPLICATION FILED MAR. 5, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 4

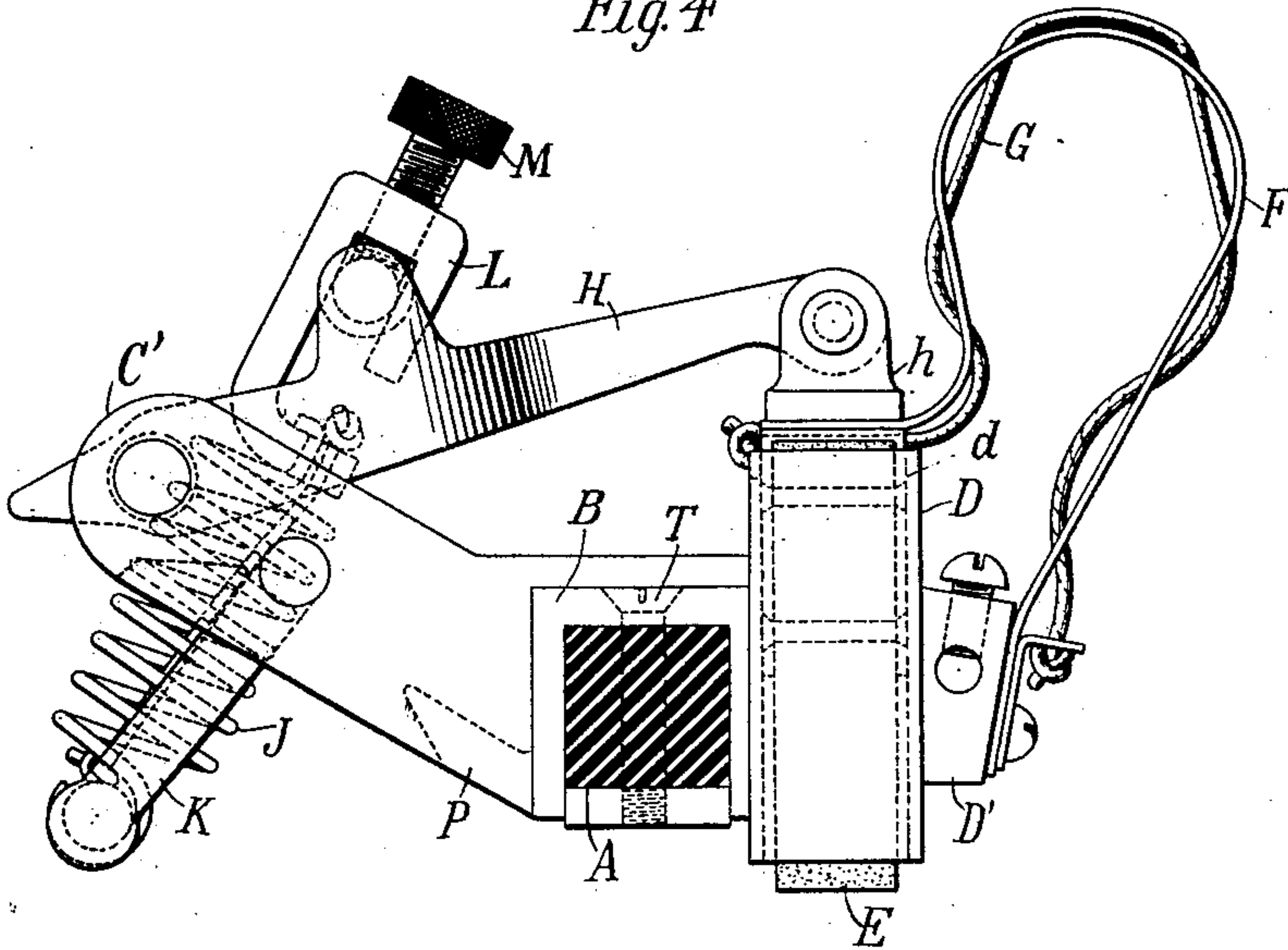
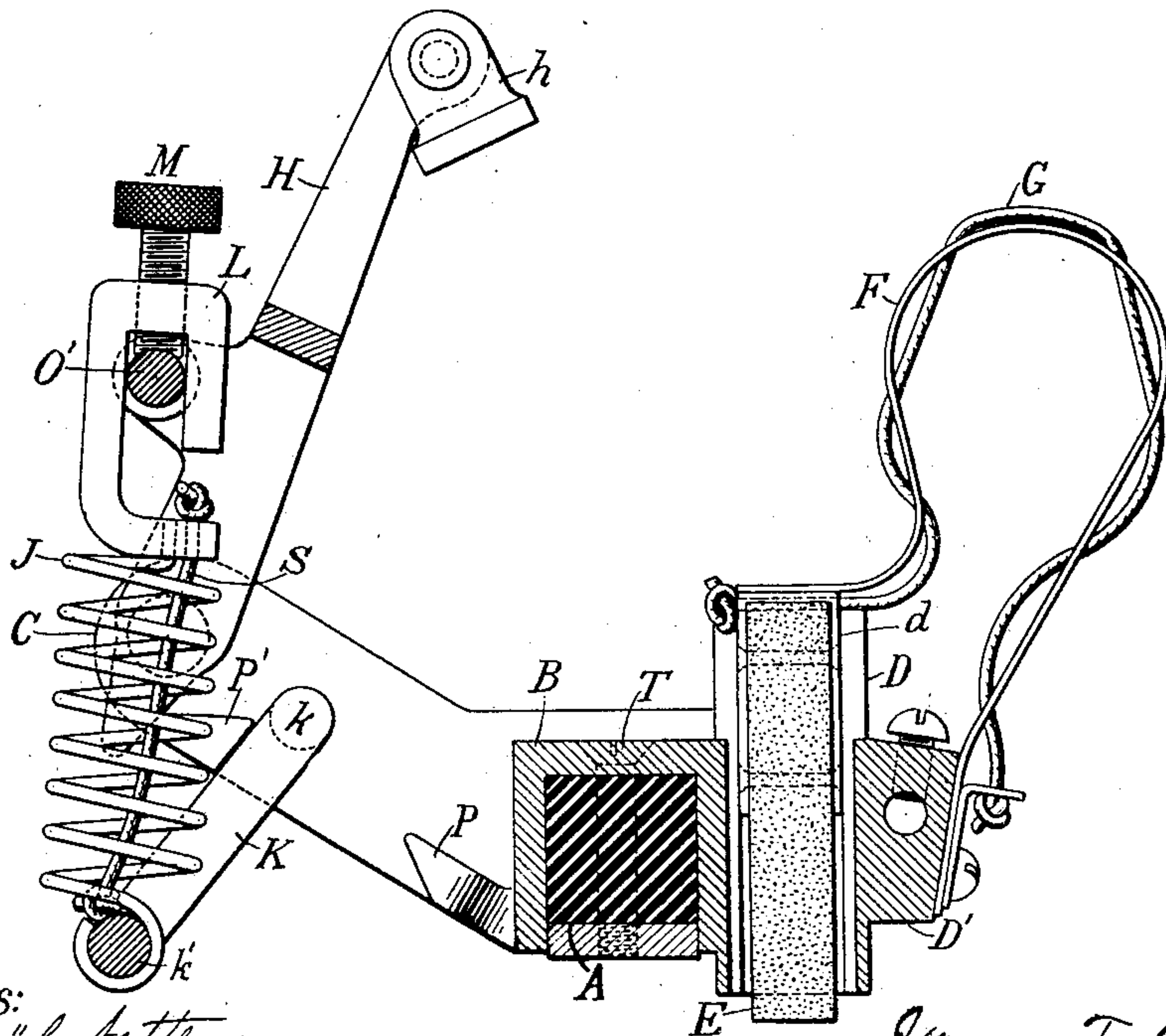


Fig. 5



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UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO CONSOLIDATED CAR HEATING COMPANY, OF ALBANY, NEW YORK, A CORPORATION OF WEST VIRGINIA.

BRUSH-HOLDER FOR ELECTRICAL MACHINES.

SPECIFICATION forming part of Letters Patent No. 747,890, dated December 22, 1903.

Application filed March 5, 1903. Serial No. 146,365. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at Albany, county of Albany, and State of New York, have invented certain new and useful Improvements in Brush-Holders, of which the following is a specification, reference being made to the accompanying drawings, wherein—

Figure 1 is a plan view of my improved holder. Fig. 2 is a vertical section thereof in its working position. Fig. 3 shows the adjusting-screw. Fig. 4 is a side elevation of the holder with the parts in their intermediate position. Fig. 5 shows the holder turned back.

My invention relates to brush-holders particularly designed for carbon brushes, though it may be employed in any situation wherein it is desirable to relieve the spring-pressure before turning back or reversing the holder or follower from its working position.

I have shown the invention applied to a holder provided with a box or channel in which a carbon brush may be retained and directed against the commutator, yet move freely therein under the action of a spring-pressed follower. The electrical connection of the brush with the holder is insured by a flexible metallic strip, secured to the brush at one end and to the holder at the other end.

The brush is pressed against the commutator by a follower which when the parts are in the working condition has a strong spring-pressure thereon, secured by a spring attached to the follower at one end and at its opposite end attached to a breakdown anchorage or abutment, which is movable with respect to the pivotal point of the follower, so as to temporarily relieve or break down the tension of the spring by changing the leverage of the spring on the follower. When the follower is to be turned back out of the way to remove the brushes, the anchorage is first brought to an intermediate position nearly in line with the pivotal point of the follower, so that the spring acts almost on a dead-center and has but a small leverage on the follower. This allows the follower to be lifted with ease and turned back till the spring acts slightly

on the opposite side of the said pivotal point and holds the follower in its raised position. There are also a number of details of construction, which will be hereinafter described and claimed, it being understood that the structure herein described and illustrated is but one of the various forms in which the principles of my invention may be embodied, being that form which I now consider as the best.

Referring to the drawings, A represents a rectangular stud projecting from a suitable part of the machine to carry the brush-holder. It may be of insulating material, but preferably of steel with an insulating-sleeve.

The frame of the brush-holder comprises the parallel wings C and C', projecting from and joined together by the hollow rectangular sleeve B, which closely surrounds the stud A and is held in place thereon by screws T, passing through both the sleeve and the stud. Directly in front of sleeve B is the vertical guide box or channel D, in which the brush E is held and directed against the commutator V.

The brush E carries at its upper end a saddle *d*, formed of a strip of thin metal bent to conform to the shape of the brush and attached thereto by rivets. To this saddle *d* is soldered one end of a flexible metallic strip F, whose opposite end is screwed to the binding-lug D' on the front of the guide-box D. This insures the electrical connection of the brush and the holder, it being understood that the brush must be free to play freely in guide box or channel D and that the mere contact of the brush with the sides of the box cannot be relied upon to maintain the electrical continuity of the circuit. A cord G, of asbestos or other suitable material, is threaded through perforations in strip F and secured at one end to brush E and at the other end to lug D'. The purpose of this is to hold the strip F, in the event of its breaking, from springing outward and striking the inclosing case of the dynamo or some other object with which connection would be undesirable. It may be observed that this arrangement is particularly designed for service on dynamos placed on the truck of a railway-vehicle and

driven by an axle for the purpose of lighting the vehicle. In such a situation it must be assumed that the apparatus will be required to run for long periods without inspection, and the arrangements herein described are particularly designed to render the operation reliable under all contingencies.

The follower H has at its forward end a pivoted tip *h*, resting on the brush E and adapted to follow the brush down as it is worn away, the wall of box D being notched to permit of the descent of the follower to the required extent. The rear end of the follower is forked, and the two branches are respectively pivoted at *c c'* to the wings C C' of the frame. The two branches are bridged by an arch O, having a round central section O', which is straddled by a link L and receives the grooved tip of an adjusting-screw M, passed through the top of the link. The tip of the screw, as shown in Fig. 3, is traversed by two grooves at right angles to each other, both shaped to fit snugly on the round section O' of the arch O and lock the screw against turning except by the exertion of considerable force, when it may be compelled to turn ninety degrees until the round action drops into the transverse groove and it is again locked till the considerable force is once more applied to give another ninety degrees of movement. This expedient permits sufficiently fine adjustment of the spring and locks the screw in any definite adjustment by a very simple and trustworthy means.

The spring J is secured at its upper end to the link L and at its lower end to the cross-bar *k'* of a U-shaped anchorage-lever K, whose two ends are pivoted, respectively, to the wings C C' at the points *k k'*, eccentric to the follower H. This lever forms the breakdown anchorage for the lower end of spring J. When the apparatus is in action, the lever is turned to the right, as shown in Fig. 2, until it brings up against the stop P. Then the spring is acting on follower H nearly at right angles thereto and at the maximum distance from its pivotal point. The spring therefore exerts a strong force on the follower to press the brush E against commutator V, and it is not easy to lift the follower against the force of the spring to turn it back, while to do so would require a considerable extension of the spring, with the danger of stretching it. Therefore the lever K is first turned to the left into the position shown in Figs. 4 and 5, where it brings up against the stop P'. In this intermediate position of the parts the tension is relieved or broken, since spring acts against the follower H on a much shorter leverage and at a smaller angle, so that it is easy to lift the follower into the free position shown in Fig. 5, with the spring acting against it on the opposite side of the pivotal point and maintaining it in that position. The brush E can then be renewed or adjusted at will. On the reverse movement the follower is first dropped into the position shown in

Fig. 4 and then lever K turned into the position of Fig. 2. It should be noted that in going from the working to the intermediate position, and vice versa, the spring throws over a dead-center formed by the alinement of centers *k, k'*, and O', while in going from the intermediate to the free position, and vice versa, it also throws over a dead-center formed by the alinement of centers *k', c, c'*, and O'. This gives a positive and definite movement of the parts from one position to another.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a brush-holder, with the brush and its follower, of a spring for pressing the brush against the commutator, means for adjusting its tension and a breakdown anchorage or abutment therefor.

2. The combination, in a brush-holder, with the brush and its follower, of a spring for pressing the brush against the commutator and a pivoted breakdown anchorage or abutment therefor.

3. The combination, in a brush-holder, of a guide for the brush, a follower to bear on the brush, a spring for the follower, and a breakdown anchorage or abutment for the spring.

4. The combination, in a brush-holder, of a guide for the brush, a follower to bear on the brush, a spring for the follower, and a pivoted breakdown anchorage or abutment for the spring.

5. The combination, in a brush-holder, of a guide for the brush, a pivoted follower, a spring for the follower, and a breakdown anchorage or abutment for the spring pivoted eccentrically to the follower.

6. The combination, in a brush-holder, of a guide for the brush, a pivoted follower, a spring, adjusting devices for said spring and a supplementary tension-breaking device comprising means for changing the angle of action of the spring on the follower.

7. The combination, in a brush-holder, of a guide for the brush, a pivoted follower, a spring for the follower, adjusting devices for said spring and a supplementary tension-breaking device comprising means for changing the leverage of the spring upon the follower.

8. The combination in a brush-holder, of a pivoted follower for the brush, an operating-spring for the follower acting thereon over a dead-center and a tension-breaking device for the spring comprising a pivoted anchorage or abutment therefor also acting over a dead-center.

9. The combination, in a brush-holder, of a guide for the brush, a follower pivoted to the frame, a pivoted anchorage or abutment for the spring, and a spring jointed both to said anchorage or abutment and to the follower.

10. The combination, in a brush-holder, of a guide for the brush, a follower, a spring for

the follower, an adjusting device therefor, means for relieving the tension of the spring and means to permit turning back the follower under spring-pressure.

5 11. The combination, in a brush-holder, of a guide for the brush, a follower, a spring for the follower, a movable tension-breaking anchorage or abutment for the spring, and stops for limiting the movement of said anchorage
10 or abutment.

12. The combination, in a brush-holder, of a guide for the brush, a follower, a spring, an anchorage or abutment for the spring movable over a dead-center with respect to the
15 follower, and means to permit moving the follower over a dead-center with respect to said anchorage or abutment.

13. The combination, in a brush-holder, of a guide for the brush, a pivoted follower, a
20 spring for the follower, a link between the spring and follower, an adjusting-screw, a movable anchorage or abutment for the spring pivoted between the pivot of the follower and the point at which the spring connects with
25 the follower, and stops on opposite sides of the said anchorage or abutment.

14. The combination, in a brush-holder, of a flexible connection between the brush and the holder and a retaining-cord therefor.

15. The combination, in a brush-holder, of 30 a spring for the brush and a retaining-cord for the spring.

16. The combination with a commutator-brush, of a spring therefor, an adjusting-screw for the spring and a bearing for the screw 35 capable of rotating in a groove in the end of the screw.

17. The combination with a commutator-brush of a guide therefor, a pivoted follower, a spring, a movable pivoted anchorage or 40 abutment to which one end of the spring is jointed, a link in the other end of the spring, a screw passing through said link, and a bearing on said follower engaging a groove in the end of the screw. 45

In witness whereof I have hereunto set my hand, this 2d day of March, 1903, before two subscribing witnesses.

JAMES F. McELROY.

Witnesses:

WILLIAM A. MORRILL, Jr.,
ERNEST D. JANSEN.