

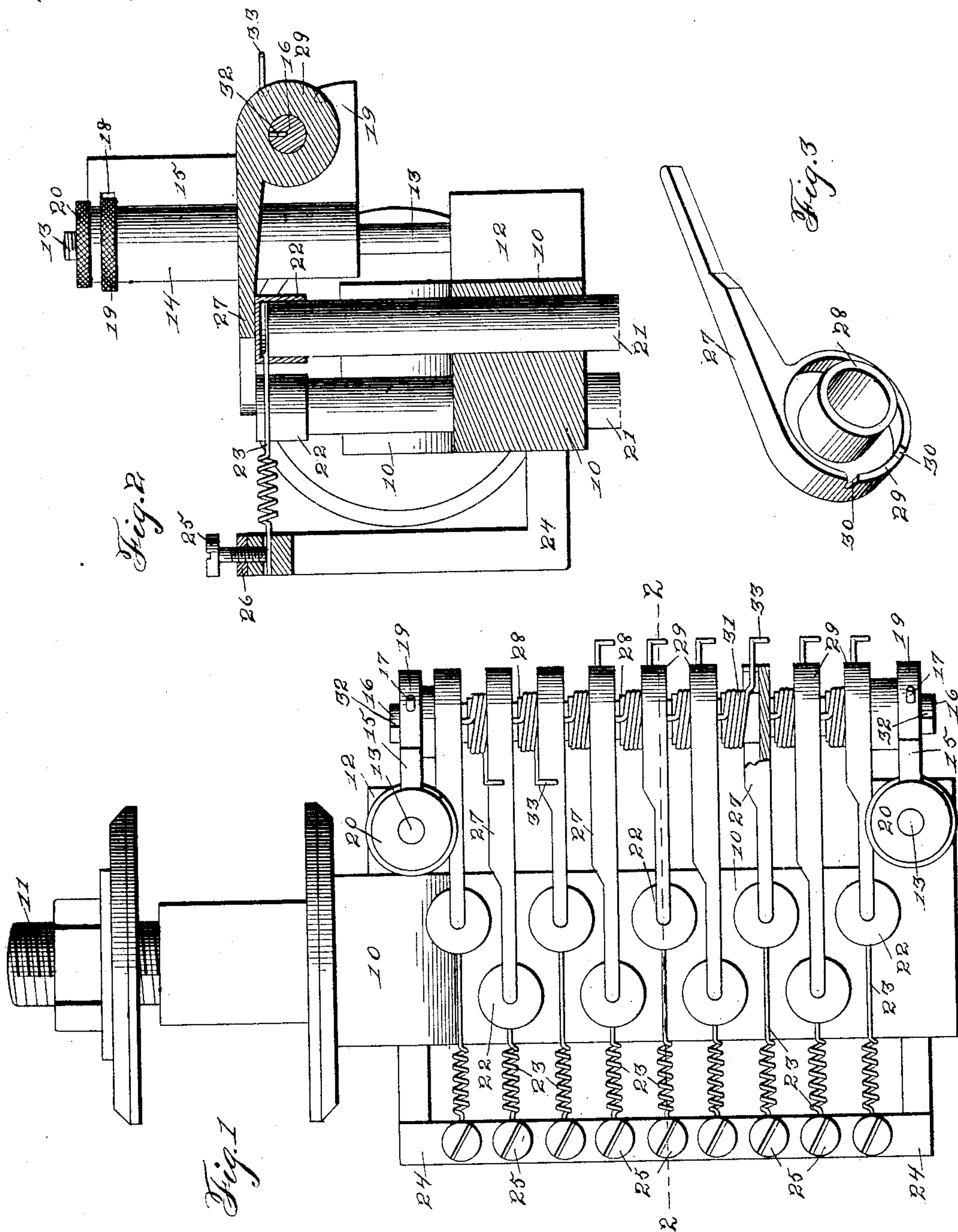
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H. J. W. LLOYD.
COMMUTATOR BRUSH HOLDER.

(Application filed Feb. 11, 1901.)

(No Model.)



Witnesses
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UNITED STATES PATENT OFFICE.

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COMMUTATOR-BRUSH HOLDER.

SPECIFICATION forming part of Letters Patent No. 688,423, dated December 10, 1901.

Application filed February 11, 1901. Serial No. 46,795. (No model.)

To all whom it may concern:

Be it known that I, HARRY J. W. LLOYD, a subject of the King of Great Britain, residing at Des Moines, county of Polk, and State of Iowa, have invented certain new and useful Improvements in Commutator-Brush Holders, of which the following is a specification.

This invention relates to that class of brush-holders in which a number of carbon pencils are used to contact with the commutator.

My objects are, first, to provide a brush-holder of this class of simple, durable, and inexpensive construction, in which an independent pressure device is provided for each pencil, said pressure device being so arranged as to be capable of supplying a very slight pressure to the top of the pencil to hold it firmly in contact with the commutator, and yet bear upon the commutator so lightly as to avoid cutting. In this connection it is to be remembered that carbons gradually wear away by use, and a further object along this line is to provide means whereby the tension of the yielding pressure device for each carbon may be readily and quickly adjusted while the device is in operation, so that substantially the same pressure may be maintained when the pencils are of any length.

A further object is to provide means in a device of this class whereby the current may be applied to or taken from the carbons direct without passing through joints or other devices not forming good conductors; and my object is, further, in this connection to provide yielding pressure devices for the carbons which are not liable to deterioration on account of having an electric current pass through the springs of the yielding pressure device; and my object is, further, to provide a device of this class in which the yielding pressure devices are not only independently adjustable, but in addition are jointly adjustable.

My invention consists in certain details in the construction, arrangement, and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows a top or plan view of the complete brush-holder, with a portion of one of the yielding pressure devices broken away

to show its interior construction. Fig. 2 shows a vertical sectional view through the indicated line 2 2 of Fig. 1. Fig. 3 shows in perspective one of the arms to be actuated by the spring for applying the yielding pressure to the tops of the carbon pencils.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate the body portion or frame of the brush-holder. One end portion of the frame is provided with the screw-threaded shank 11, whereby it may be connected with a portion of the machine-frame.

In the body portion 10 is a series of vertical openings of a size to admit carbon pencils of the size usually employed in arc-lamps. These openings are preferably arranged in two parallel rows, with the holes of one row arranged between the holes of the adjacent row for purposes hereinafter made clear.

At one side of the main portion of the frame 10 are the extensions 12 at opposite end portions of the frame. In each of these extensions is an upright 13, screw-threaded at its upper portion, and mounted upon these uprights, with the sleeves 14, are the frames 15. These frames support a cross-bar 16, which is fixed in said frames by means of the pins 17. Near the top portion of each of the sleeves 14 is a slot 18, and a nut 19 is placed in said slot and in engagement with the screw-threads of the rods 13. Hence when said nuts are turned the sleeves 14 will be moved vertically upon the rods 13. I have also preferably placed upon the top of each rod 13 a lock-nut 20 to engage the top of the sleeve 14. By this means it is obvious that the bar 16 is adjustably supported in a position parallel with and above the main portion of the frame 10.

The carbon pencils are of the ordinary kind and are indicated by the reference-numeral 21, one carbon being passed through each of the openings in the frame 10. At the top of each carbon I have fitted a metal cap 22, and in each cap I have passed a conducting-wire 23 through the cap and between the top of the cap and the top of the carbon, and the wire is flattened out on the interior of the cap, so that it cannot pull through the opening in the cap through which it was passed. I preferably place solder between the top of the cap and said wire.

Attached to one side of the frame 10 is a bar 24, preferably made of copper or some other suitable conductor. The ends of said bar are electrically connected with the body portion 10, and the central portion of the bar extends upwardly to a point at or near the upper limit of movement of the pencils. Each of the wires 23 is connected with said bar and a set-screw 25, capable of being forced downwardly into engagement with the end of the wire 23, a lock-nut 26 being placed on said set-screw to prevent it from working loose on account of the vibrations of the brush-holder. By this means it is obvious that the current may pass from the body portion 10 to each pencil or from the pencils to the frame 10 through good electrical conductors and that no joint or working parts appear in this continuity of electrical conductors, which would be liable to decrease the conductivity of the parts, and yet the free vertical movement of the pencils is not in any way interfered with.

The means for providing yielding pressure independently to the pencils comprise an arm 27, having a tubular extension 28 at one end designed to admit the bar 16 and be capable of rotary movement thereon. Some distance from the exterior of the extension 28 is an annular rim 29 and projecting in the same direction from the body portion of the arm 27, and in this rim is a series of notches 30. The opposite end of the arm projects far enough to engage and rest upon the top of the corresponding pencil when the tubular extension 28 is on the bar 16. One of these arms is placed upon the bar 16 for each of the pencils, and I have mounted upon each of the tubular extensions 28 a coil-spring 31. One end of the coil-spring is bent downwardly to enter an opening in the bar 16. This projecting end is indicated in Fig. 2 by the reference-numeral 32. The opposite end of the coil-spring projects radially from the tubular extension 28 and then at right angles at 33 to form a handle and to overlap the arm 27.

In practical use and assuming the body portion 10 to be secured to a motor or dynamo frame and the pencils 21 to be in engagement with a commutator, it is obvious that a continuity of good electrical conductors is established from each pencil to the body portion 10 without having the current passed through a sliding or movable joint. Furthermore, any one of the pencils may be readily and quickly moved from the body portion 10 and a new one substituted therefor without stopping the commutator. Furthermore, if a comparatively light pressure is desired on top of each pencil the end 33 of the spring is permitted to rest upon the top of the arm 27, as shown in some of the parts of Fig. 1. If greater pressure is desired, the end 33 is grasped by the operator and placed in one of the slots 30, thereby winding up the spring and increasing its pressure upon the arm. By this means a number of different tensions may be applied to the arm 27 quickly and

easily and without stopping the commutator. When, however, the pencils have all become worn, so as to be materially shorter, the bar 16 may be lowered by a manipulation of the nuts 19 and 20. When it is desired to detach any one of the pencils, it is only necessary to loosen the set-screw 25, remove the wire 23 from the bar 24, then elevate the arm 27 and bodily remove the pencil. A new one may readily be substituted for the old by fitting it in the cap 22, from which the other pencil was taken.

Heretofore in devices of this class the only electrical connection between the pencils and the body portion of the frame was had through the pivoted arm upon the stationary rod electrically connected with the frame. In devices of this class the current has been required to "jump" from one part to the other of the metal, and hence has frequently heated the metal in such manner as to materially weaken said part. Furthermore, where such electrical connection is relied on a current is frequently short-circuited by "jumping" from the carbon direct to the body portion of the frame in which it is mounted. This also causes a heating of the parts and a consequent consuming, and the pencils in the frame are wholly or partially consumed, which obviously permits them to move in their supports in the frame and causes what is known as "chattering." In some instances the arm 27 has been projected on the opposite side of the pivotal point, a contractile coil-spring attached thereto and secured to an elevated support. This has always been found objectionable for the reason that there is a tendency for the current to pass from the carbon pencils through the spring, which obviously would tend to weaken the spring if it became heated by the current, and if the support to which the springs are attached is made of any ordinary substance that is not an electrical conductor said substance will bend under the heat, and thereby weaken the pressure of the springs of the central pencils, causing them to wear unevenly upon the commutator.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

1. An improved commutator-brush holder comprising in combination a body portion having a number of openings therein, a series of carbon pencils slidingly mounted in said openings, uprights connected with the body portion, a bar vertically adjustable on said uprights, a series of arms pivotally mounted on the bar and designed to engage the tops of the carbon pencils, an independent yielding pressure device to engage each arm, independent means for adjusting the tension of each spring, and an independent electric conductor connected with each carbon pencil and with the body portion of the machine, for the purposes stated.

2. An improved commutator-brush holder, comprising in combination a body portion hav-

ing a number of openings therein, a series of carbon pencils slidingly mounted in said openings, uprights supported at one side of the body portion, a bar 16 adjustable vertically upon said uprights, a series of arms 27 having tubular extensions 28, rims 29 and notches 30 in said rims, loosely mounted upon said bar 16, a coil-spring mounted upon each of the tubular extensions 28, and having one end fixed to the bar 16 and the other capable of engaging the top of the arm or of entering any of the notches 30, and an electrical conductor connected with the top of each carbon pencil

and also with the body portion of the frame, substantially as, and for the purposes stated. 15

3. In a commutator-brush holder, the combination of a metal cap designed to receive a carbon pencil, a wire passed through the top portion of the cap to the interior thereof and flattened or enlarged, substantially as, and 20 for the purposes stated.

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Witnesses:

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