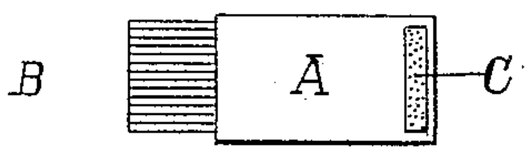
(No Model.)

F. O. BLACKWELL.

COMMUTATOR BRUSH.

No. 462,466. Patented Nov. 3, 1891.

Fig I



A

Fig III

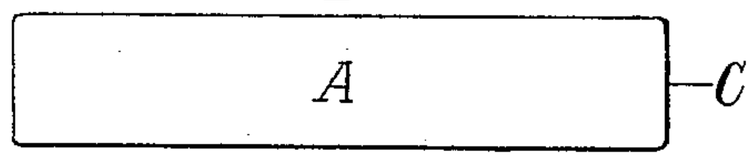


Fig IV

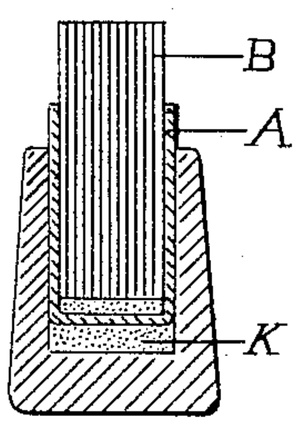


Fig II

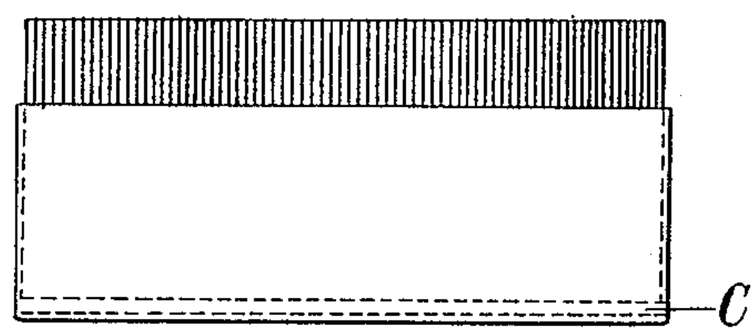


Fig V

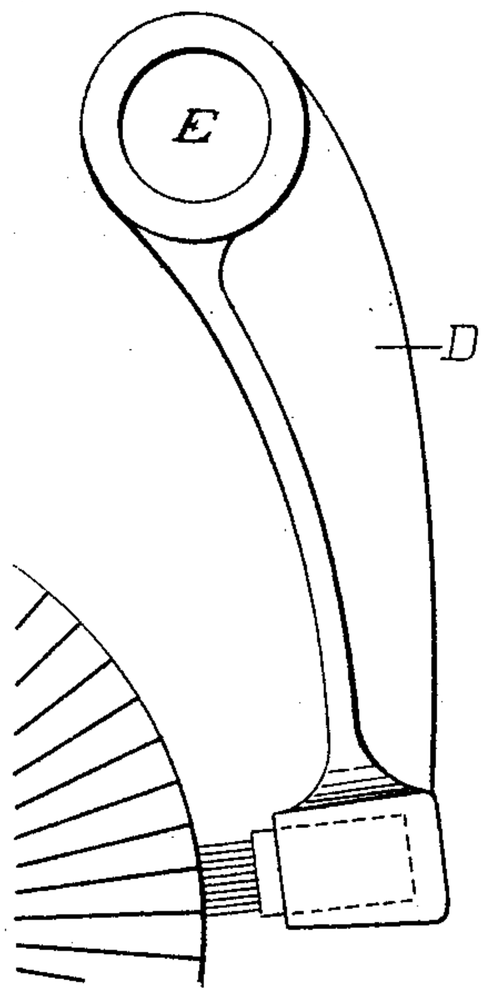
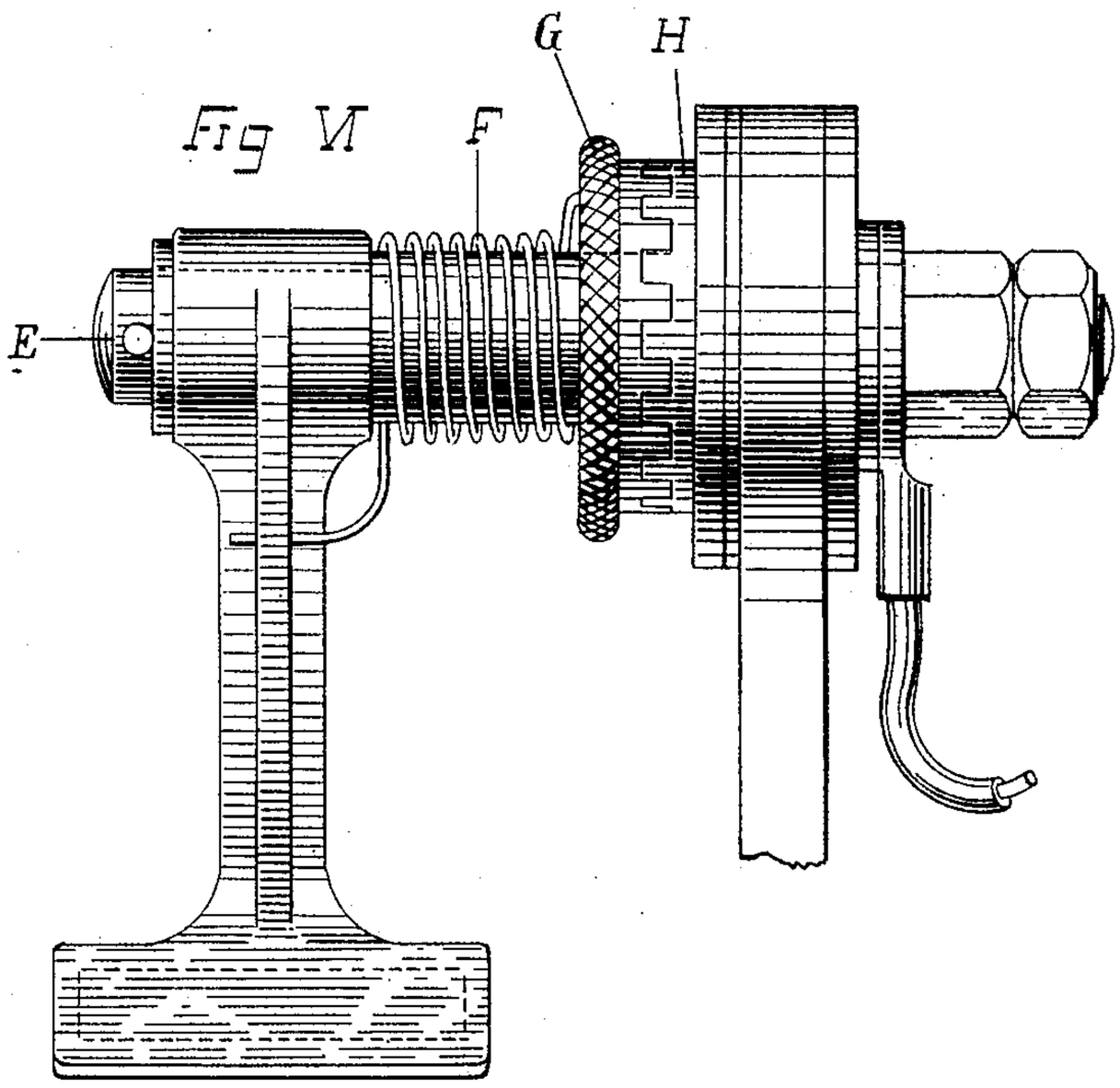


Fig VI



Witnesses

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UNITED STATES PATENT OFFICE.

FRANCIS O. BLACKWELL, OF NEW YORK, N. Y., ASSIGNOR TO THE THOMSON-HOUSTON ELECTRIC COMPANY, OF CONNECTICUT.

COMMUTATOR-BRUSH.

SPECIFICATION forming part of Letters Patent No. 462,466, dated November 3, 1891.

Application filed March 5, 1889. Serial No. 301,862. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS O. BLACKWELL, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Commutator-Brushes, of which the following is a specification.

My invention relates to commutator-brushes for electric railways; and it consists, first, of a metallic box open at one end filled with loose pieces of small wire having their rear ends resting on a layer of felt at the bottom of the box. This brush as a whole is set in a metallic holder, which is held by spring-pressure against the commutator.

My invention is illustrated in the accompanying drawings, in which—

Figs. I, II, and III are respectively end, side, and back elevations of my brush, comprising the box and loose wires. Fig. IV is a transverse section of the brush in position in the holder. Fig. V is an end elevation of the holder with the brush in position against the commutator. Fig. VI is a side elevation of the same, showing the spring and adjusting devices.

In the drawings, A is a rectangular metallic box made of thin sheet copper.

B are a number of small loose copper wires placed on end in the box, a layer of felt being first placed in the bottom of the box and held in place by passing through the slit in each end of the box.

The device thus far described I call a "brush." The wires rest on their ends against the commutator and form an easy yielding contact-surface, each wire having a slight independent movement with a little resiliency imparted to it by the felt. This brush is placed in position by being set in a cavity of the proper shape formed on the end of a holder D. This holder D has a brush-socket at its lower end, and at its upper end it embraces a stud E, attached to a fixed part of the machine. The holder D turns freely about the stud E, and a coiled spring F is attached at one end to the brush-holder and at the other end is fixed to the stud, so that it tends to impart a pressure of the brush-holder against the commutator. This spring is adjusted by having its inner end attached to a disk G, which has teeth engaging the fixed disk H on the inner end of stud E. The pressure of the spring holds the teeth of G constantly in engagement with those of H. The torsion of the spring may be adjusted by forcing G forward and turning it around and then allowing it to engage with H in a different position.

The brush thus formed is a very durable one, the wear being all upon the wires B, which may be replaced without trouble. By arranging the wires perpendicularly to the bearing-surface of the commutator a large number of contacts are provided, which will reduce the sparking, and the resiliency of the wires allows the brush to accommodate itself to the surface of the commutator and wear down evenly.

In practice the box A will be filled with wires, which will be held in place by a tight-fitting cover or a strip of adhesive tape. To place one in position it is only necessary to lift up the arm D against the tension of spring F, drop out the box in which the wires have been worn down and insert a new box, taking off the cover or adhesive tape at the same time. The wire B will then be held constantly against the commutator, and the brush never requires any attention until it is worn out.

I secure still further adjustment of the bearing-surfaces by placing a layer of felt in the bottom of the holder D, so that the box as a whole may receive a little adjustment from the resiliency of the felt, while a finer adjustment is secured by the independent movement of the wires B relative to one another.

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

1. The combination, with a brush-holder, of a containing-box, a number of independent wires placed therein, and a layer of felt or similar substance giving an independent resiliency to each wire.

2. A commutator-brush composed of a number of small wires, with a containing-box therefor, and a common resilient piece of felt or similar substance giving an independent movement to each wire.

3. The combination, with a commutator-

brush composed of a number of independent wires and a containing-box therefor, of a holder adapted to receive the box movable freely toward and away from the commutator, and a spring pressing the holder against the commutator.

4. The combination of a commutator with a brush-holder having a socket at its lower end and pivoted at its other end so as to swing freely toward or away from the commutator, a brush arranged perpendicularly to the surface of the commutator and having a bearing at its inner end within the socket, and a spring giving the holder a rotating tendency about the pivotal point, whereby the brush is held in place by its ends bearing, respectively, against the commutator and socket.

5. The combination, with a commutator-brush consisting of a number of metallic pieces having an independent resilient bearing against the commutator, of a holder having a spring-pressure against the commutator, and an intermediate resilient piece between the holder and the brush, giving the commutator-brush as a whole an elastic bearing on the holder.

6. The combination, with a fixed stud, of a brush-holder having a rotary movement around the stud, a coiled spring giving a spring-pressure in the direction of said movement, and a notched adjusting-disk between the inner end of the coiled spring and a similar notched disk attached to the stud.

7. The combination, with a containing-box A, of independent wires B, a layer of felt C, a holder D, an intermediate layer of felt K, and a spring for pressing the holder against the commutator.

8. The combination, with a commutator, of a pivoted brush-holder having a socket at its lower end, a box therein, and independent wires bundled together in said box and pressed against the commutator.

9. As an article of manufacture, the containing-box having a number of independent wires placed perpendicularly therein, and a layer of felt or similar material on which the ends of the wires rest.

FRANCIS O. BLACKWELL.

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