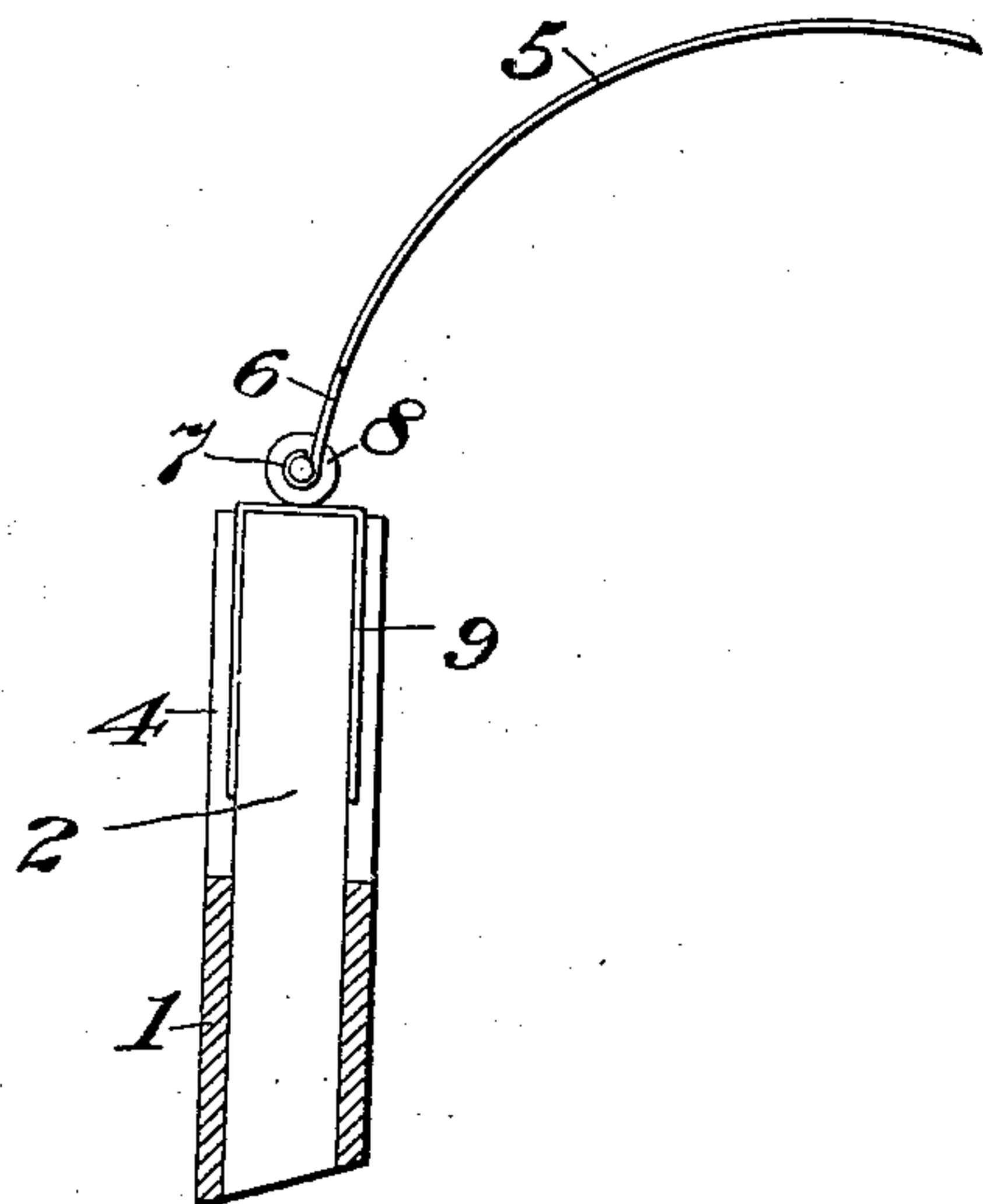


J. H. POOLE.  
BRUSH SPRING FOR DYNAMOS AND MOTORS.  
APPLICATION FILED MAR. 19, 1907.

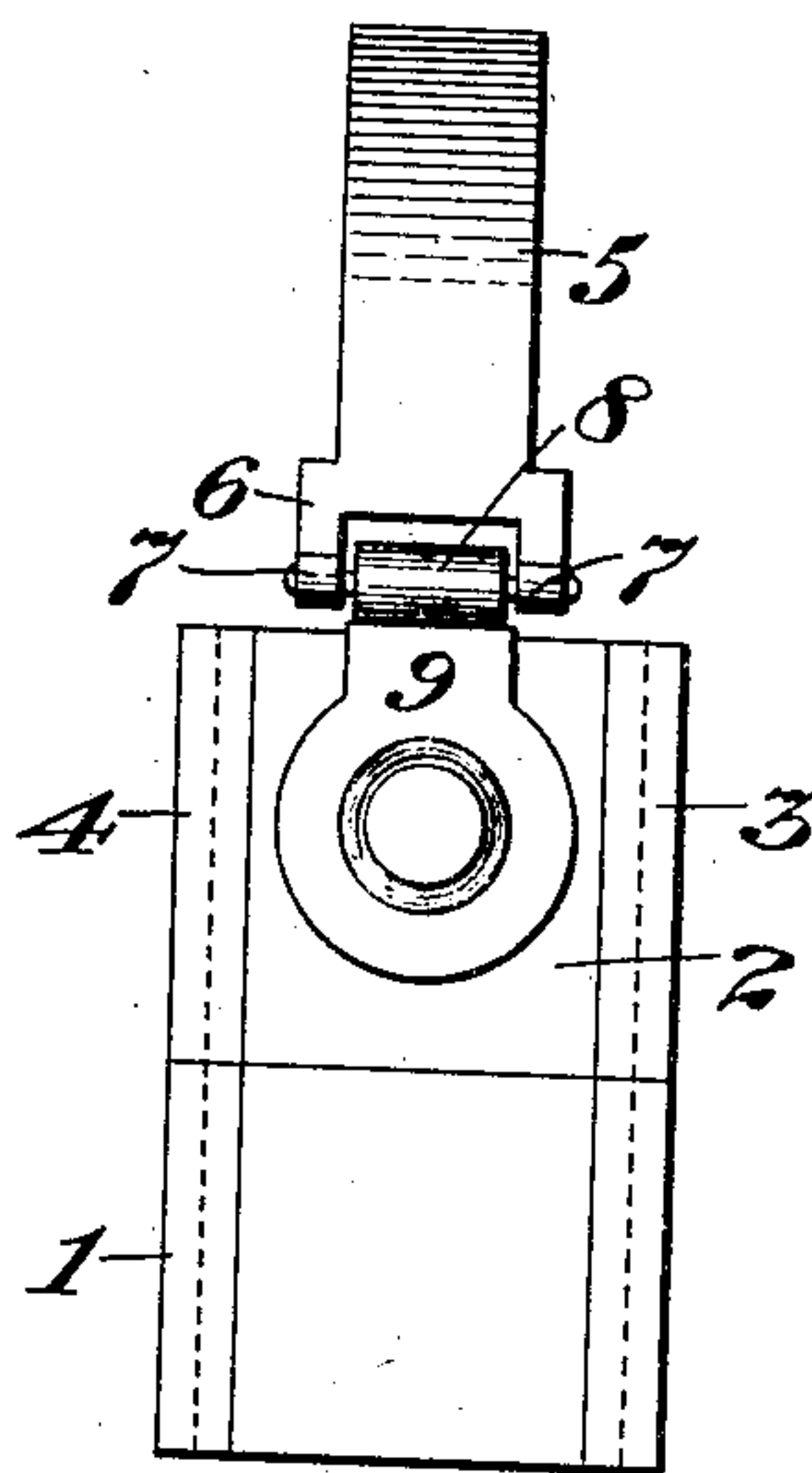
913,562.

Patented Feb. 23, 1909

*Fig. 1*



*Fig. 2*



WITNESSES  
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# UNITED STATES PATENT OFFICE.

JOHN H. POOLE, OF WASHINGTON, DISTRICT OF COLUMBIA.

## BRUSH-SPRING FOR DYNAMOS AND MOTORS.

No. 913,562.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed March 19, 1907. Serial No. 363,214.

*To all whom it may concern:*

Be it known that I, JOHN HUDSON POOLE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented a new and useful Brush-Spring for Dynamos and Motors, of which the following is a specification.

My invention relates to commutator brushes for dynamos or motors.

It particularly concerns commutator brushes of the type wherein the brush consists of a bar of conducting material guided in a holder and pressed downward into contact with the commutator by a curved steel spring bearing upon the top surface of the brush.

The object of the invention is to apply the pressure of the spring in such manner as to keep the brush in constant and intimate contact with the commutator of the machine, notwithstanding the vibration which may be set up by the machine when running at high speeds. According to my invention, this is accomplished by my special means for insuring application of the spring pressure in a direction perfectly normal to the surface of the brush, thus preventing the brush from becoming cocked or bound against the sides of the brush holder. I can accomplish this by the means illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation, partly in section, showing the brush holder broken away in vertical section. Fig. 2 is a front elevation of a brush holder, brush, and spring, with my invention applied thereto.

In said drawings, the brush holder is of any known or desired type, but preferably consists of a bottom portion 1, inclosing the brush 2 on all sides, and upstanding guide-ways 3, 4, leaving an opening at the front and rear for play of the end of the brush spring 5, on the extremity of which is a yoke 6, provided with outside bearings 7, in which is journaled a small steel roller 8. The metallic plate 9 on the upper surface of the brush forms a true bearing surface at right angles to the front, rear, and sides of the brush. The roller 8 revolves freely in the bearings 7, so that the pressure of the spring transmitted to the brush is always normal to the top surface of the latter, and hence is applied in a direction exactly parallel to the sides and faces of said brush. This prevents any binding of the brush on the sides of the brush holder, and enables the brush

to take up the small shocks and jars transmitted to it by the commutator without becoming cocked or bound in the brush holder, thus avoiding sparking.

I am aware that prior to my invention carbon brushes and brush holders of the form shown herein have been used and also that curved steel springs have been used to hold such brushes against a commutator. In fact, my invention was the result of practical use of a construction substantially such as is shown in the United States Patent to Erben 705,055, granted July 22nd, 1902. The construction therein disclosed includes a spring of such peculiar proportions that it tends to bear centrally and evenly upon the rear end of the brush in all positions of wear of the latter, hence an antifriction roller at the end of said spring would appear to one skilled in the art as unnecessary and without useful function. I have discovered, however, that in the case of high speed electric machines, vibrations are set up which in certain cases cause wear between the brush and its holder and between the spring and the end of the brush or cap covering the latter. It is not necessary to explain at length the precise functioning of this difficulty, it being sufficient to point out that as a matter of fact such a spring, even when carefully designed, may, and commonly does, transmit pressure having sufficient lateral component to cause the brush to become "cocked" as herein above set forth. This effect I have entirely remedied by the above simple expedient.

I claim:

1. A brush holder, a brush mounted for endwise movement in said holder, and a curved leaf spring, one end of which is suitably supported and the other end of which bears upon a portion of the rear face of the brush, in combination with an antifriction roller arranged as the bearing surface for said spring, whereby high speed vibrations may take effect as resilient lateral movements of said roller without transmitting to the brush of any lateral component of said movements.

2. A brush holder, a brush slidably mounted therein, and a longitudinally curved spring flattened in a direction transverse to the plane of curvature, one end of said spring being suitably supported, so that the other end thereof normally tends to bear on the same portion of the rear face of the



brush, in combination with an antifriction roller arranged as the bearing surface for said spring, whereby vibratory displacements from the normal bearing point may be corrected by resilient movement of said arm without the transmission to the brush of any lateral component of said movement of vibratory displacement.

3. A holder and a resilient arm, one end of which is suitably supported and the other end of which is maintained in bearing contact with the top of the brush by the resilient quality of said arm, in combination with an antifriction roller for the bearing surface of said arm, whereby said vibratory displacements of said bearing point may be corrected by resilient movement of said arm without the transmission to the brush of any lateral component of said movement of vibratory displacement.

4. A brush holder, a brush slidably

mounted therein, and a flat spring bearing against the rear face of said brush by the resilient quality of said spring, in combination with a pair of outside bearings and an antifriction steel roller mounted therein and forming the bearing surface for applying the pressure of said spring to said rear face of said brush, whereby vibratory displacements of the normal bearing point may be corrected by resilient movement of said spring without the transmission to the brush of any lateral component of the movements of vibratory displacements.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

J. H. POOLE.

Witnesses:

R. A. DELLETT,  
ALEX. B. EADIE.