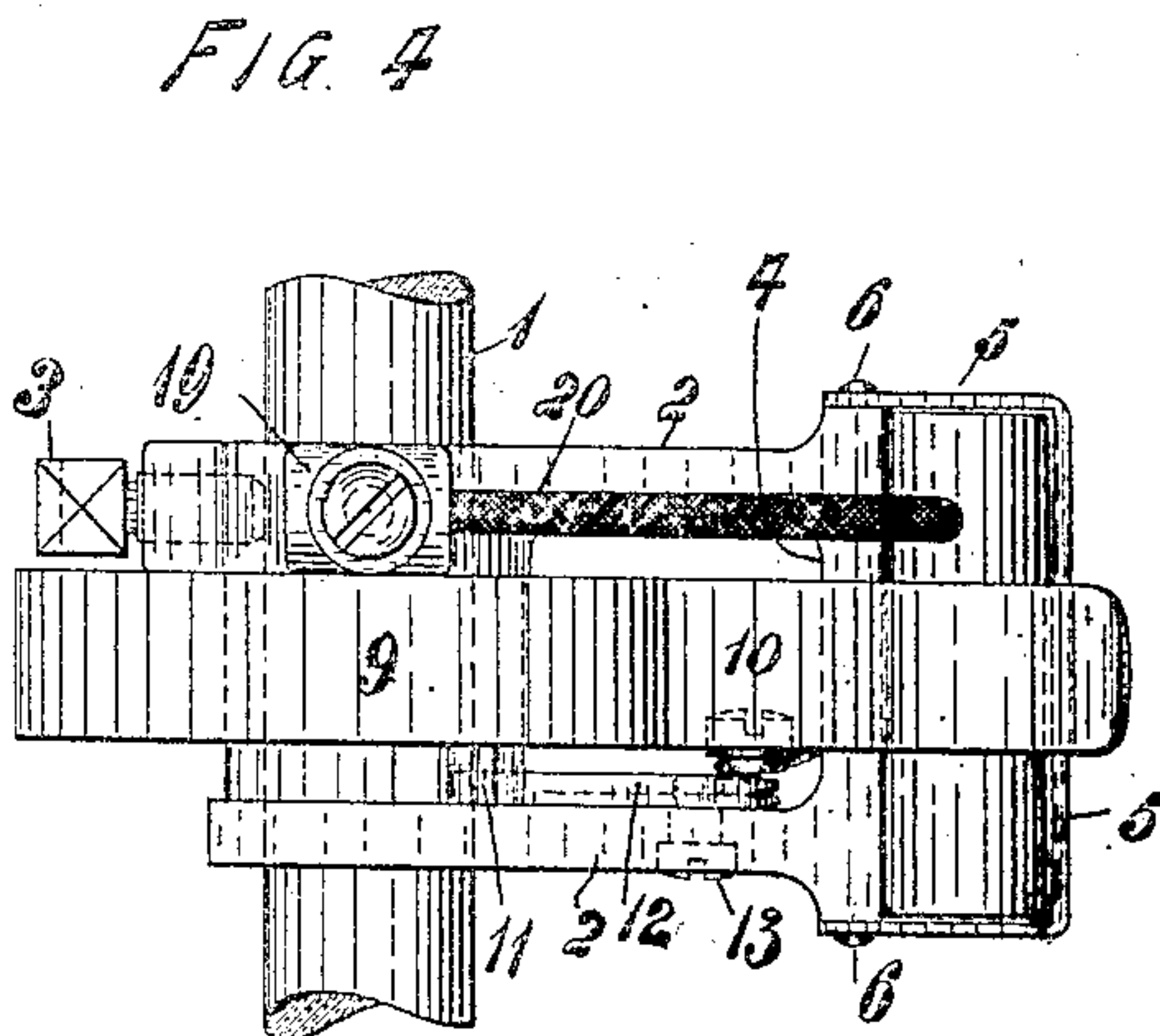
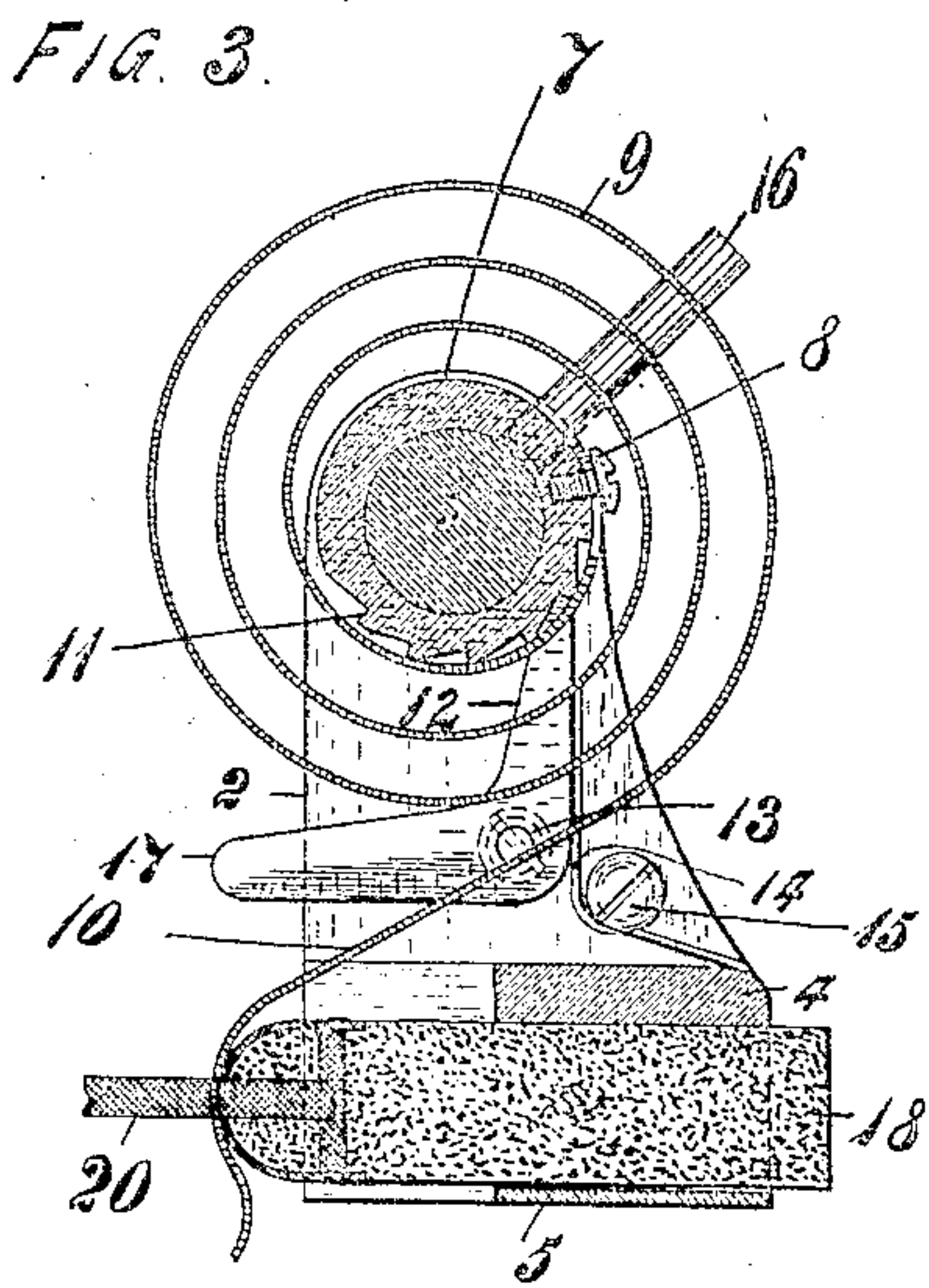
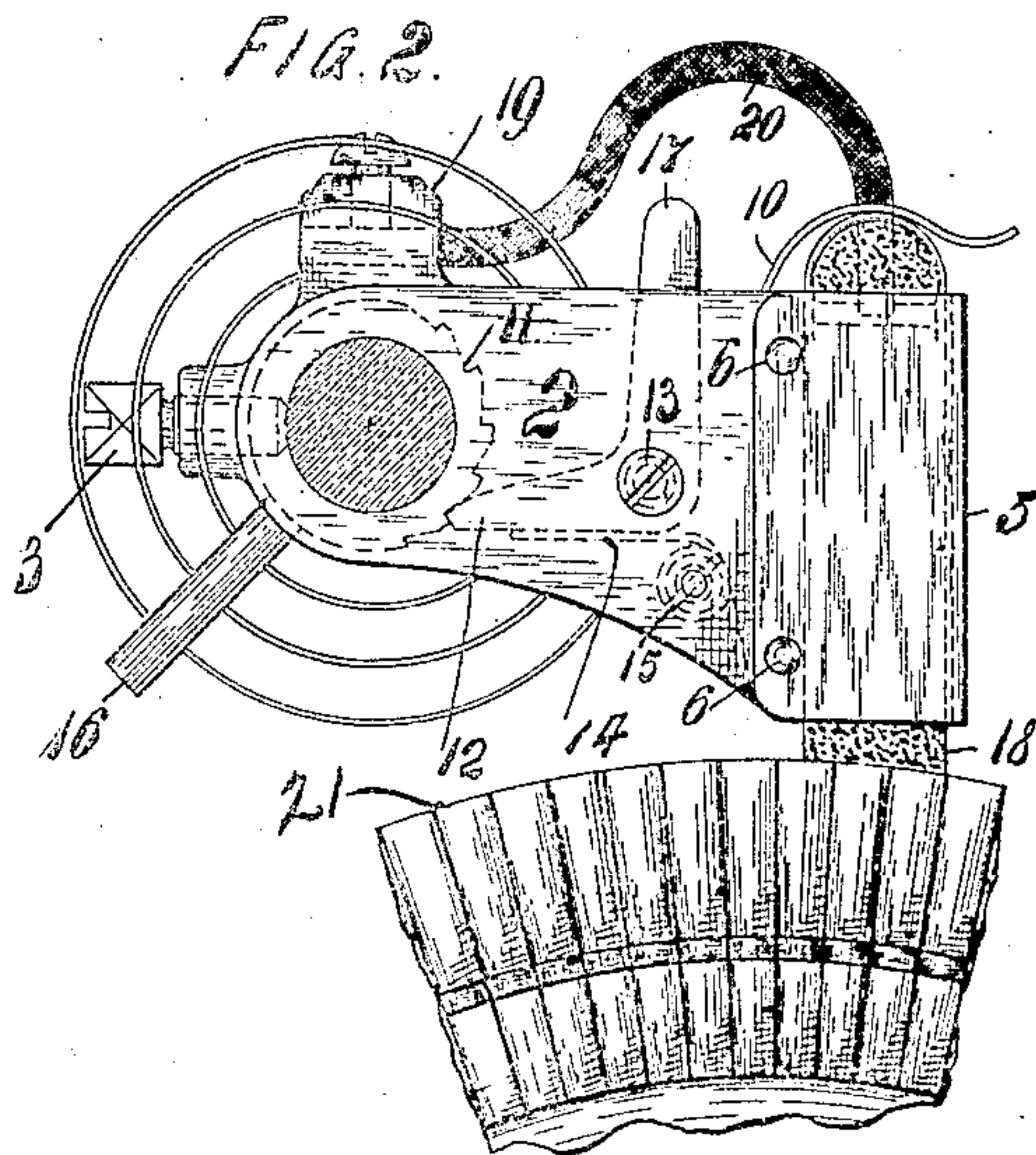
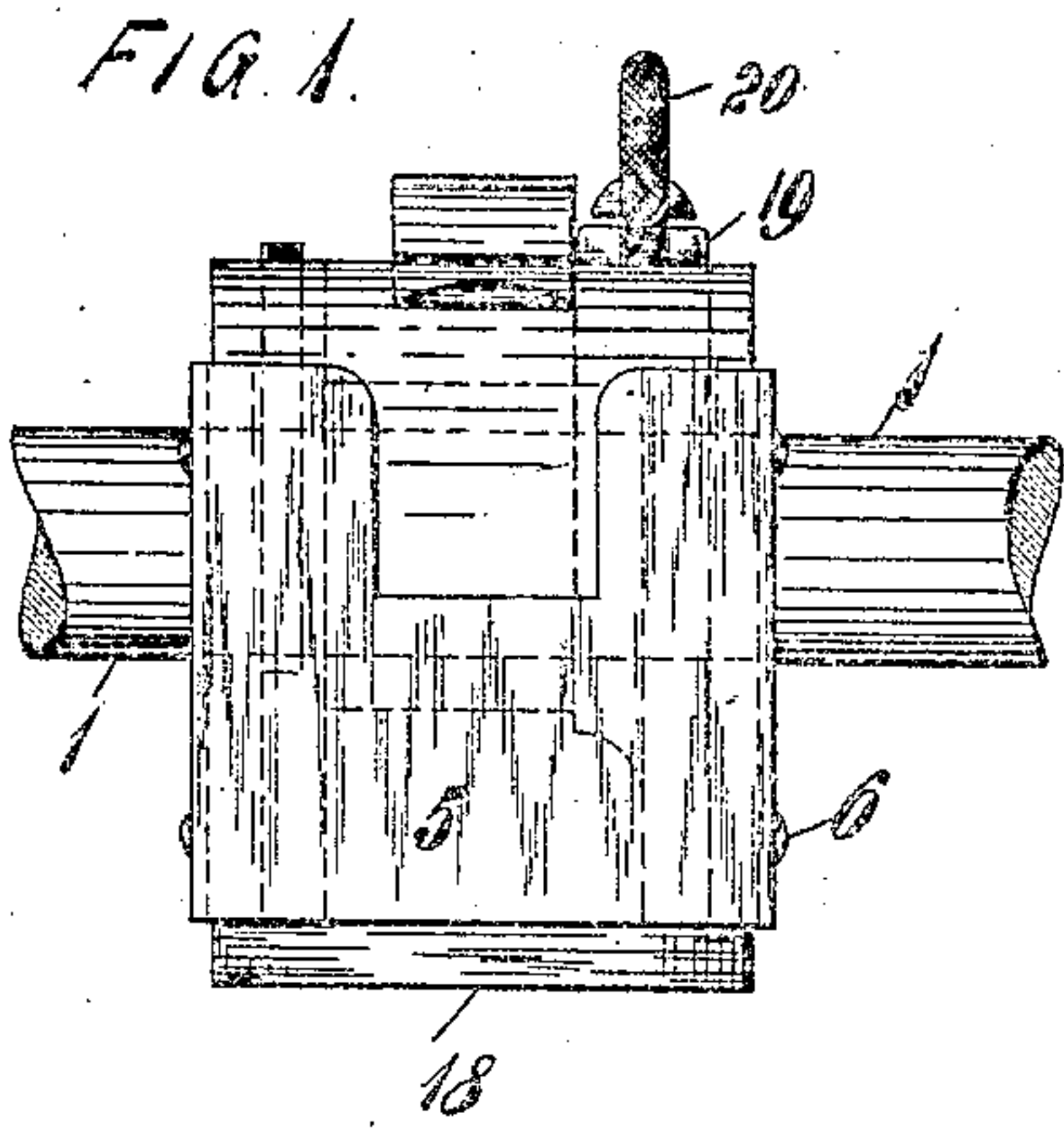


H. L. ZABRISKIE.
BRUSH HOLDER.
APPLICATION FILED SEPT. 9, 1904.

912,350.

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BRUSH-HOLDER.

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To all whom it may concern:

Be it known that I, HENRY L. ZABRISKIE, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Brush-Holders, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The object of this invention is to provide a brush-holder of the "box" type which shall be compact, rigid and simple in construction, and which shall be readily interchangeable in machines of the same or different sizes, and in which the tension of the brush upon the commutator shall be uniform throughout a large range of movement of the brush by reason of its wear upon the surface of the commutator.

20 In the preferred form of the present invention, the usual supporting stud or mandrel of the machine has secured thereon, so as to be adjustable circularly and longitudinally, a pair of laterally projecting spaced rigid arms of the brush socket, and has fitted thereon a loose sleeve having attached thereto one end of a coiled spring encircling the same and provided with a lateral arm extended into alignment with the brush-socket to bear upon the outer end of the carbon brush-block, the sleeve having formed also upon one end a segmental series of ratchet-teeth adapted to be engaged by a spring-pressed pawl pivotally connected with the brush socket, the said sleeve being provided with a radial arm by which it may be turned in opposition to said spring for presentation of different ratchet-teeth of the series to the pawl in adjusting the tension of the spring.

40 In the drawings annexed, Figure 1 is a front view of the brush-holder embodying the present improvement, and Fig. 2 a side view of the same showing a portion of the commutator of a dynamo electric machine. Fig. 3 is a transverse section of the brush-holder, and Fig. 4 a plan of the same.

50 The frame of the brush-holder comprises two spaced supporting arms 2 having holes in their outer ends fitted to the brush-holder stud 1, one of such arms being fixed upon such stud by means of the set-screw 3. The connecting plate 4 at the opposite end of the arms 2 forms a wall of the guiding box or socket open at the ends and having the other three sides formed by the angular cap piece

5 secured thereto by the screws or rivets 6. Intermediate the arms 2 is mounted upon the stud 1 the loose sleeve 7 to which is attached by means of a screw 8 the inner end of a coiled spring 9 whose outer portion is formed in a straight tangential arm 10 having a reversely bent extremity extending into the line of the brush socket 4, 5. The sleeve 7 is provided with a series of peripheral ratchet teeth 11 engaged by the operative end of an annular pawl-lever 12 pivotally mounted at 13 upon the inner side of one of the arms 2 and maintained yieldingly in engagement with the ratchet teeth 11 by means of a spring 14 secured upon the arm 2 by a fastening screw 15. A radial pin 16 is provided upon the sleeve 7 to serve as a handle in turning the same, while the arm 17 of the angular pawl-lever serves a similar purpose when it is desired to shift the pawl to disengage it from the ratchet teeth upon the sleeve 7.

The brush, shown herein as consisting of a carbon block 18, is provided with a rounded end against which the outer end of the tangential arm 10 of the spring 9 rests, current being carried from the brush to the stud 19 upon the brush-holder frame by means of a flexible connecting lead 20.

85 In the use of the device, the holder having been applied to the supporting stud 1 with the component parts in the relations above described, and the outer end of the spring arm 10 being brought to bear upon the rounded rear end of the brush 18, the tension of the spring is adjusted by turning the sleeve by means of the radial rod 16, the return rotation of the same being prevented by the pawl-lever 12. As the brush wears down by its rubbing contact with the commutator 21, the arm 10 advances and, by reason of the tangential relation of the brush-guiding box or socket with the axis of the spring lever, the latter continues to exert its pressure in a direction substantially longitudinal of the brush by reason of its unwinding, due to the gradual yielding of the abutment offered by the end of the brush and the consequent changed angular position of its free arm 10. As this spring is preferably formed of a very thin strip of metal in several coils, and its operation is substantially in the direction of motion of the brush under the wearing action of the commutator thereon, the spring operates with great uniformity

throughout its range of action. As will be observed by reference to Fig. 2, the brush-socket 4 5 is disposed in substantially radial relation with the commutator 21, and hence the brush-block 18 is maintained in corresponding relation therewith, which produces a tendency to uniform wear of the operative end of the brush-block upon the commutator.

By disposing the spring in such manner that the axis of its coils is coincident with that of the supporting stud, it is evident that a great gain in compactness is secured as compared with other forms of brush-holders of this class heretofore devised, while the particular relation of the frame with the loose sleeve makes it a simple matter to design brush-holders of this character for varying sizes of brushes with practically no remodeling of the parts excepting changes in the widths of the members sufficient to accommodate the brushes of different sizes.

The present improvement affords certain material advantages over brush-holders of its class heretofore devised, among which may be mentioned its compactness and capability of adjustment within wide limits. By the employment of the ratchet-and-pawl holding device for the sleeve 7, a locking member is provided, in the pawl 12, having sidewise movements longitudinally of the brush-holder stud 1, and the width of the frame 2, 4, 5, is reduced to a minimum, whereby a number may be placed side-by-side upon the stud for use with the larger commutators requiring a large contact surface of the brushes, which is necessarily sectional in character in order to insure the best contact relation. Each brush-holder, according to the present invention, is entirely self-contained, the supporting arms 2 carrying means (as the set screws 3), for securing them in any position of longitudinal or circular adjustment upon the brush-holder stud 1, such construction affording a range of adjustment which is not affected by the application of a series of such brush-holders to a common brush-holder stud, and each being capable of adjustment independently of the others, where a plurality are associated together upon a common supporting stud. This range of adjustment is evidently important, both to compensate for wear of the brushes and of the commutator, and adapts the brush-holder to a wider range of use than other devices of the same general character.

While I have shown and described herein only a single embodiment of the present improvement, it will be understood that the latter is susceptible of considerable modification in construction without departure from the spirit of the invention.

Having thus set forth the nature of my invention, what I claim herein is,—

1. The combination with a supporting

stud or mandrel, of a brush-holder comprising a frame constructed with a brush-socket open at the opposite ends and provided with a pair of laterally projecting spaced rigid arms having alined transverse apertures fitted to and entered by said stud or mandrel, means carried by said frame for securing it upon said stud or mandrel adjustably circularly and longitudinally, a tubular sleeve loosely fitted directly upon and supported by said stud or mandrel intermediate said arms, a coiled spring encircling and having one end attached to said sleeve and provided at the other end with a lateral arm extended into line with and adjacent one end of the socket, a ratchet-and-pawl device intermediate one of said spaced arms and the loose sleeve for locking the latter from turning under the action of the spring, and means applied to the sleeve independently of its locking means for turning it to wind up the spring.

2. The combination with a supporting stud or mandrel, of a brush-holder comprising a frame constructed with a brush-socket open at the opposite ends and provided with a pair of laterally projecting spaced rigid arms having alined transverse apertures fitted to and entered by said stud or mandrel, means carried by said frame for securing it upon said stud or mandrel adjustably circularly and longitudinally, a tubular sleeve loosely fitted directly upon and supported by said stud or mandrel intermediate said arms and provided at one end with a segmental series of ratchet-teeth, a coiled spring encircling and having one end attached to said sleeve and provided at the other end with a lateral arm extended into line with and adjacent one end of the socket, a spring-pressed pawl pivotally mounted upon one of said spaced arms and adapted to engage said ratchet-teeth for locking the latter from turning under the action of the spring, and means applied to the sleeve independently of its locking means for turning it to wind up the spring.

3. The combination with a supporting stud or mandrel, of a brush-holder comprising a frame constructed with a brush socket open at the opposite ends and provided with a pair of laterally projecting spaced rigid arms having alined transverse apertures fitted to and entered by said stud or mandrel, means carried by said frame for securing it upon said stud or mandrel adjustably circularly and longitudinally, a brush-block within said socket, a flexible connecting lead having one end secured directly to the brush-block and the other end attached to said frame, a tubular sleeve loosely fitted directly upon and supported by said stud or mandrel intermediate said arms, a coiled spring encircling and having one end attached to said sleeve and provided at the other end with a lateral arm extended into line with the socket

and adapted to bear upon an end of the brush-block, a ratchet-and-pawl device intermediate one of said spaced arms and the loose sleeve for locking the latter from turning under the action of the spring, and means applied to the sleeve independently of its locking means for turning it to wind up the spring.

4. The combination with a supporting stud of a dynamo electric machine, of a brush-holder comprising a frame provided with a brush-guiding box or socket and with a pair of spaced parallel arms each fitted to said stud, with one of the latter secured thereon so as to be adjustable circularly and longitudinally, a loose sleeve mounted directly upon said stud intermediate said arms and formed at one end with peripheral ratchet-teeth, a coiled spring embracing and having its inner end attached to said sleeve and provided with an arm extended into line with said box or socket, a pawl-lever having one arm provided with a tooth for engagement with the ratchet-teeth of said sleeve and another arm extending laterally of the arms of said frame and pivoted at the junction of its arms upon one of the latter, and means for turning said sleeve in respect of said frame, said stud performing the function of a support and a uniting member for the component relatively movable parts of said brush-holder.

5. In a dynamo electric machine, the com-

bination with the commutator, and a supporting stud adjacent thereto, of a brush-holder comprising a frame provided with a brush-guiding box or socket substantially radial in respect of said commutator and with a pair of spaced parallel arms each fitted to said stud and one of the latter secured thereon so as to be adjustable circularly and longitudinally, a loose sleeve mounted directly upon said stud intermediate said arms and formed at one end with peripheral ratchet-teeth, a coiled spring embracing and having its inner end attached to said sleeve and provided with an arm extended into line with said box or socket, a pawl-lever having one arm provided with a tooth for engagement with the ratchet-teeth of said sleeve and another arm extending laterally of the arms of said frame and pivoted at the junction of its arms upon one of the latter, and means for turning said sleeve in respect of said frame, the said stud performing the function of a support and a uniting member for the component relatively movable parts of said brush-holder.

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

HENRY L. ZABRISKIE.

Witnesses:

JOSEPH F. JAQUITH,

H. A. KORNEMANN.