

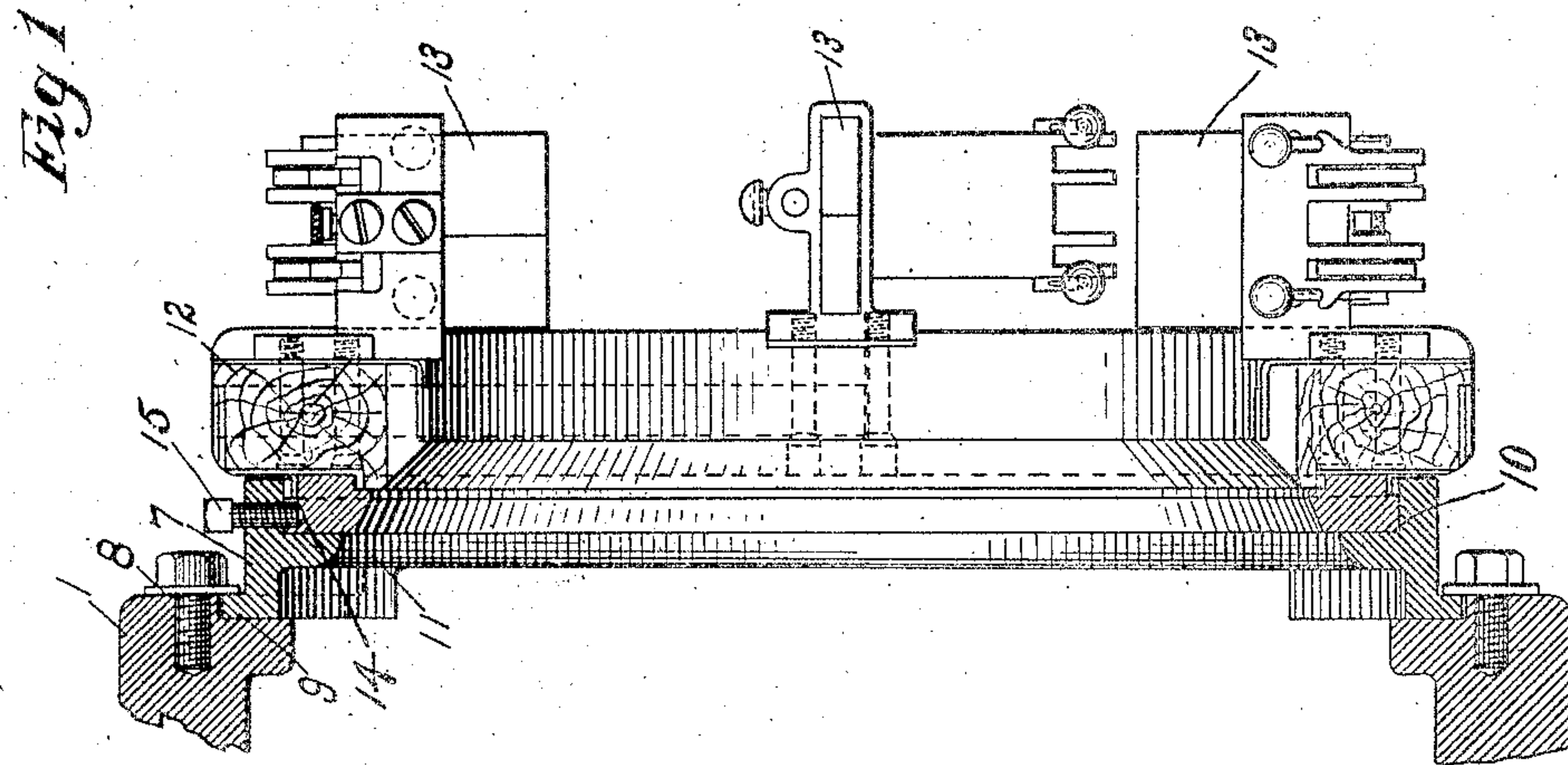
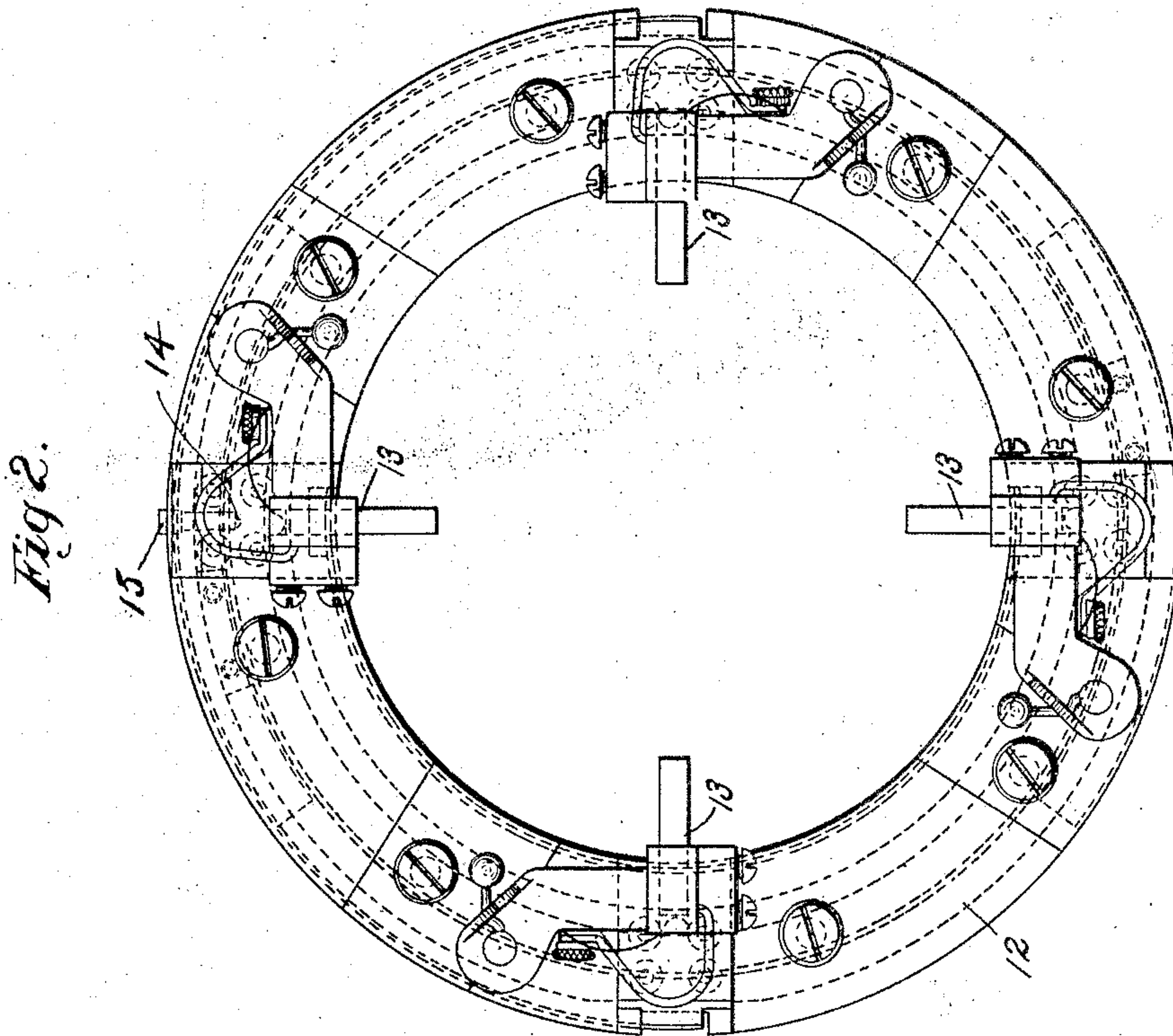
No. 880,437.

PATENTED FEB. 25, 1908.

A. BALL.  
BRUSH HOLDER.

APPLICATION FILED NOV. 30, 1906.

2 SHEETS—SHEET 1.



Witnesses:  
Irving U. Townsend  
Jesse A. Holton.

Inventor:  
Albert Ball  
by  
Emory and Smith, Attys.



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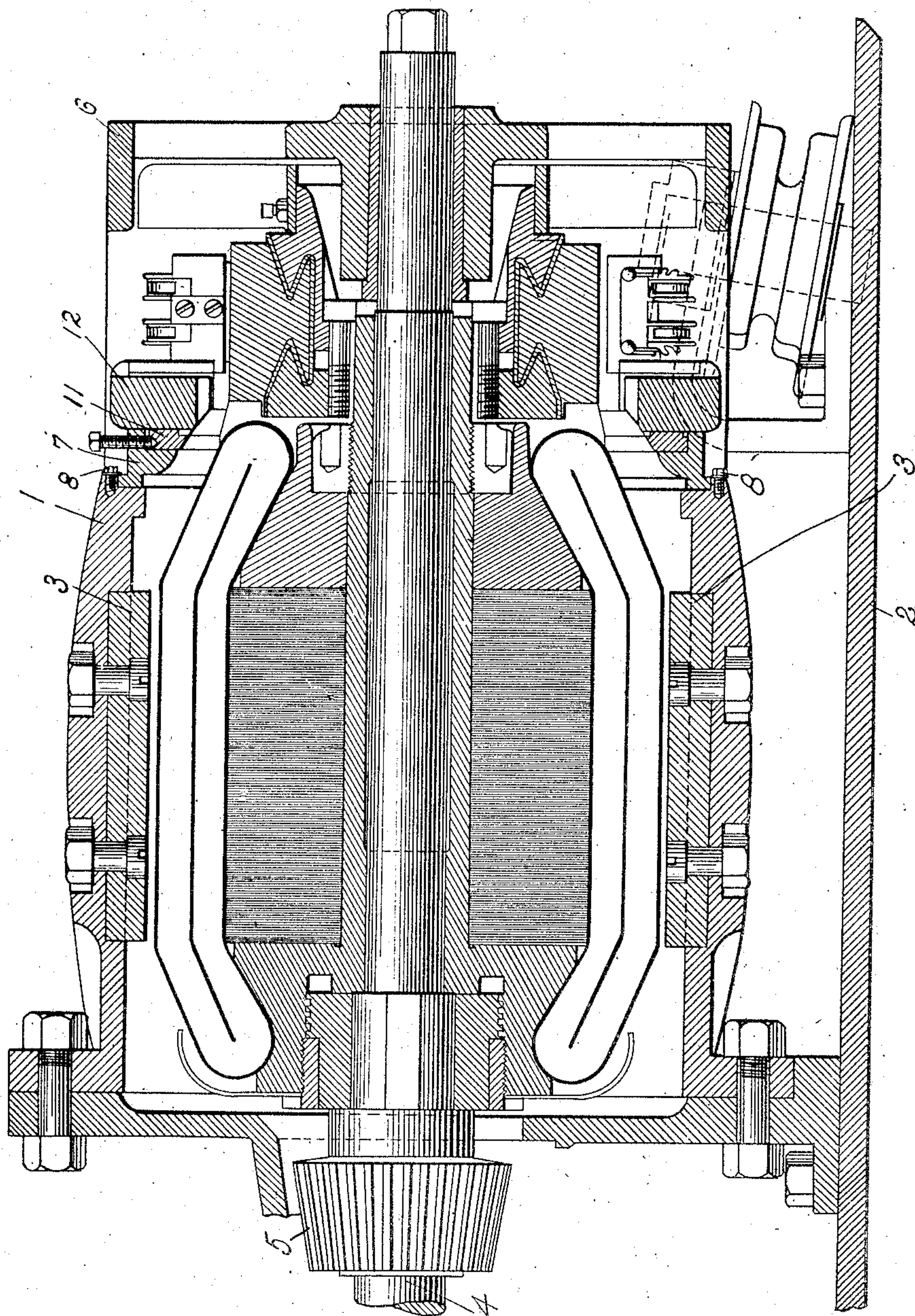
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2 SHEETS—SHEET 2.

Fig 3



Witnesses:  
Irving U. Townsend  
Jesse A. Holton.

Inventor:  
Albert Ball  
by Emery and Booth Attys.



# UNITED STATES PATENT OFFICE.

ALBERT BALL, OF CLAREMONT, NEW HAMPSHIRE, ASSIGNOR TO SULLIVAN MACHINERY COMPANY, OF CLAREMONT, NEW HAMPSHIRE, A CORPORATION OF MAINE.

## BRUSH-HOLDER.

No. 880,437.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed November 30, 1906. Serial No. 345,586.

*To all whom it may concern:*

Be it known that I, ALBERT BALL, a citizen of the United States, residing at Claremont, in the county of Sullivan and State of New Hampshire, have invented an Improvement in Brush-Holders, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to brush holders for use in connection with electric motors and dynamos of various types. While said brush holder is adapted for general use in connection with electric motors or dynamos used for various purposes and in various relations, I have in the present type or embodiment of the invention disclosed the same in connection with an electric mining machine, to which the same is peculiarly adapted, though in no sense limited thereto.

In order that the principles of the invention may be apparent, I have disclosed one illustrative type or embodiment thereof in the accompanying drawings, wherein,—

Figure 1 is a vertical central sectional view of a motor frame, a brush holder supporting ring, and means for securing the same in proper position upon said frame; Fig. 2 is an end elevation of the mechanism shown in Fig. 1; and, Fig. 3 is a longitudinal central section representing the brush holder as applied to a motor employed upon an electrically driven mining machine.

Referring to that specific embodiment of the invention disclosed in the drawings, the motor frame, which may be of any desired type, is represented at 1. For illustrative purposes and as showing one manner of contemplated use of the invention, I have herein indicated the motor frame as supported upon a flat bottom plate or shoe 2, of a mining machine. In the specific type of mechanism referred to and herein indicated, the machine is caused to slide along the mine bottom upon the plate or shoe 2 and without the necessity of tracks or the like, the feeding preferably taking place through appropriate engagement with a fixed feed chain having anchored ends in accordance with the general principles disclosed in U. S. patent to Mitchell No. 656,414. It is apparent, however, that the brush holder may be employed upon mining machines of any suitable type,

as well as upon machines other than mining machines.

The motor employed may be of any desired type. In the present construction I have herein represented field magnets 3, secured to the motor frame and a motor shaft 4, mounted in suitable journals in said frame, the said shaft in the present instance having a beveled gear 5 thereon, adapted through suitable connections to operate the cutting or other mechanism of the mining machine in any preferred manner. While the motor frame may be of any suitable construction, it is herein shown as having at one end an encircling casing 6, and as having secured to the edge of an adjacent portion of the framing, the brush supporting mechanism embodying one type of my invention, it being apparent that said brush supporting mechanism may be suitably supported upon any desired part, so that the brushes may be brought into the desired relation to the commutator.

Referring particularly to Figs. 1 and 2 upon the annular edge or face of the motor frame 1, is secured a base ring 7, in any desired manner, as for example by clamping screws 8, engaging in the present instance an annular flange 9, at the base of said ring, which, as herein shown, is turned or formed to provide an annular way or track 10, wherein is received for rotation the brush holding ring 11, secured therein in any suitable manner, as by gib plates. To said ring is secured in the present instance, in any suitable manner, a wooden or other non-metallic ring 12, upon which the brushes 13, are suitably mounted, so as to be properly positioned with respect to the commutator. It is desirable to have free and ready access to the brushes for examination or repair, and yet it is essential that the brushes be maintained in substantially exact working relation, so that the motor may be operated without sparking. In many types of mechanism it is difficult or impossible to obtain access to the brushes when in operative position, and hence it becomes necessary to shift the support for the brushes to obtain access thereto. After such shifting it may be a matter of considerable difficulty to return said brushes to their proper position of adjustment. Heretofore, while brushes have been mounted so that



they may be withdrawn from operative position for repair and examination, they have not been so mounted that convenient access may be had thereto and yet they may be readily and quickly returned to exact predetermined position. In the class of mechanism with which I have shown a type of brush supporting device of my invention, the bottom plate or shoe 2, is customarily so located with reference to the brush supporting ring 11, mounted in a plane normal thereto, that a brush supported at or near the lower portion of the ring is very difficult of access, because of the proximity of said bottom plate or shoe, and moreover the entire mechanism may be in use so positioned that access may readily be had only at a single part of the mechanism, as, for example, the upper part of the ring 11, viewing Fig. 3. By rotating said ring 11, each of the brushes 13 may, in turn be brought into position for ready examination, wherever desired. Were no means provided for determining the proper adjusted position of the brushes 13, and the ring 11 supporting the same, after each such examination of the brushes it would be necessary carefully to re-adjust or determine precisely the position of the brushes. This would be a matter involving the expenditure of considerable time and involving skill and judgment. In order that the brushes may readily be returned to proper position, I have provided the ring 11 with brush position-establishing provisions, whereby the same may be secured in predetermined position and have provided cooperating means upon a member with respect to which said ring 11 rotates. In the present type of the invention the said ring is provided with a socket 14, adapted to receive the end of a set screw 15, herein shown as mounted in an overhanging portion of the ring 7. The socket 14 is formed in a predetermined portion of the ring 11, which is determined after proper experiment. When the set screw 15 is screwed into its socket, the brushes 13 are maintained in proper operative position. When it is desired to have ready access to the brushes for any purpose the set screw 15 may be sufficiently unscrewed to permit rotation of said ring 11, which may be readily returned to its proper position, so that the said set screw and socket may be brought into register. It is apparent that within the scope of my invention other means may be employed by me to accomplish this result.

In assembling the mechanism the inner ring 11, carrying the brush holder, is positioned in the base ring 7, and secured therein by the set screw 15. Said rings are then rotated as an entirety until the said set screw is at a point of convenient access and the brushes are brought to the correct position. The set screws 8, securing the base ring 7 to the motor frame, permit the fine adjustment

of the brushes relative to the commutator and when this position has been determined, the said set screws 8 are made fast and no further adjustment of the base ring 7 is generally necessitated, inasmuch as the inner ring 11 is always returned to the same relative position with respect to said base ring 11, in the manner previously described.

Having thus disclosed one type or embodiment of the invention, I wish it to be understood that although specific terms are used, they are employed in a generic or descriptive sense merely and not for purposes of limitation, the scope of the invention being set forth in the following claims.

#### Claim.

1. A brush mechanism for electric motors or the like comprising a motor frame, a base support rotatably mounted upon the said frame, and means to secure the same in any desired position of circumferential adjustment, whereby the brushes may be adjusted to a non-sparking position, a rotatable brush supporting ring sustained by said base support with capacity for rotative adjustment, brushes supported thereby, and cooperating securing provisions upon said base support and said ring for maintaining said brush supporting ring in a predetermined position of rotative adjustment.

2. A brush mechanism for electric motors or the like comprising a motor frame, a base ring rotatably mounted upon said frame, and means to secure the same in any desired position of circumferential adjustment, whereby the brushes may be adjusted to a non-sparking position, a rotatable brush supporting ring sustained by said base ring with capacity for rotative adjustment brushes supported thereby, and cooperating securing provisions upon said respective rings for maintaining said brush supporting ring in a predetermined position of rotative adjustment.

3. A brush mechanism for electric motors or the like comprising a motor frame, a base ring rotatably mounted upon said frame, and means to secure the same in any desired position of rotative adjustment, whereby a non-sparking position may be secured, a rotatable brush supporting ring sustained by said base ring with capacity for rotative adjustment, brushes supported thereby, a locking device carried by one of said rings and cooperating provisions upon the other ring so located that when brought into register with the locking device the brushes are maintained in proper position.

4. A brush mechanism for electric motors or the like comprising a motor frame, a base ring secured thereto, means to secure said base ring in any desired position of rotative adjustment to secure non-sparking, a rotatable brush supporting ring sustained by said base ring with capacity for rotative adjustment, brushes supported thereby, a set



5 screw carried by one of said rings, the other ring having a set screw receiving socket so located that when brought into register with said set screw the brushes are maintained in proper position.

10 5. A brush mechanism for electric motors or the like comprising a motor frame, a base ring rotatably mounted upon said frame, said ring being circumferentially adjustable to a non-sparking position, means to secure said ring in such non-sparking position, a rotatable brush supporting ring sustained by said base ring with capacity for rotative adjustment with reference thereto, brushes supported thereby, a locking device carried by one of said rings, and cooperating provisions upon the other ring so located that when brought into register with the locking device the brushes are maintained in proper position.

20 6. A brush mechanism for electric motors

or the like comprising a motor frame, a base ring rotatably mounted upon the said frame, said ring being freely and circumferentially adjustable, whereby the ring may be secured in a non-sparking position, set screws securing said base ring in such position, a rotatable brush supporting ring sustained by the base ring with capacity for rotative adjustment relative thereto, brushes supported thereby, a locking device carried by one of said rings, and cooperating provisions upon the other ring so located that when brought into register with the locking device the brushes are maintained in proper position.

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

ALBERT BALL.

Witnesses:

LEE A. KNIGHTS,  
JAMES A. BRUCE.