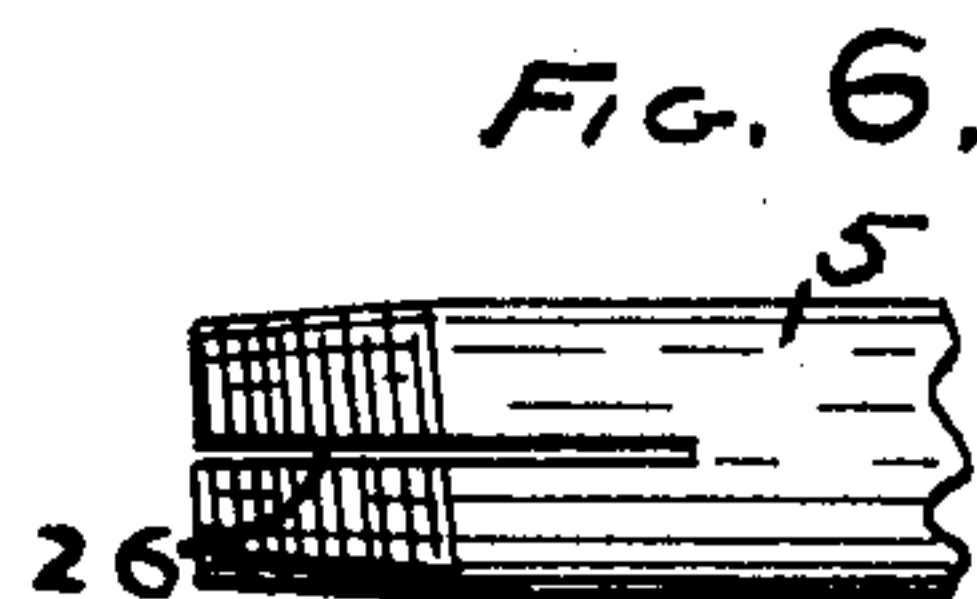
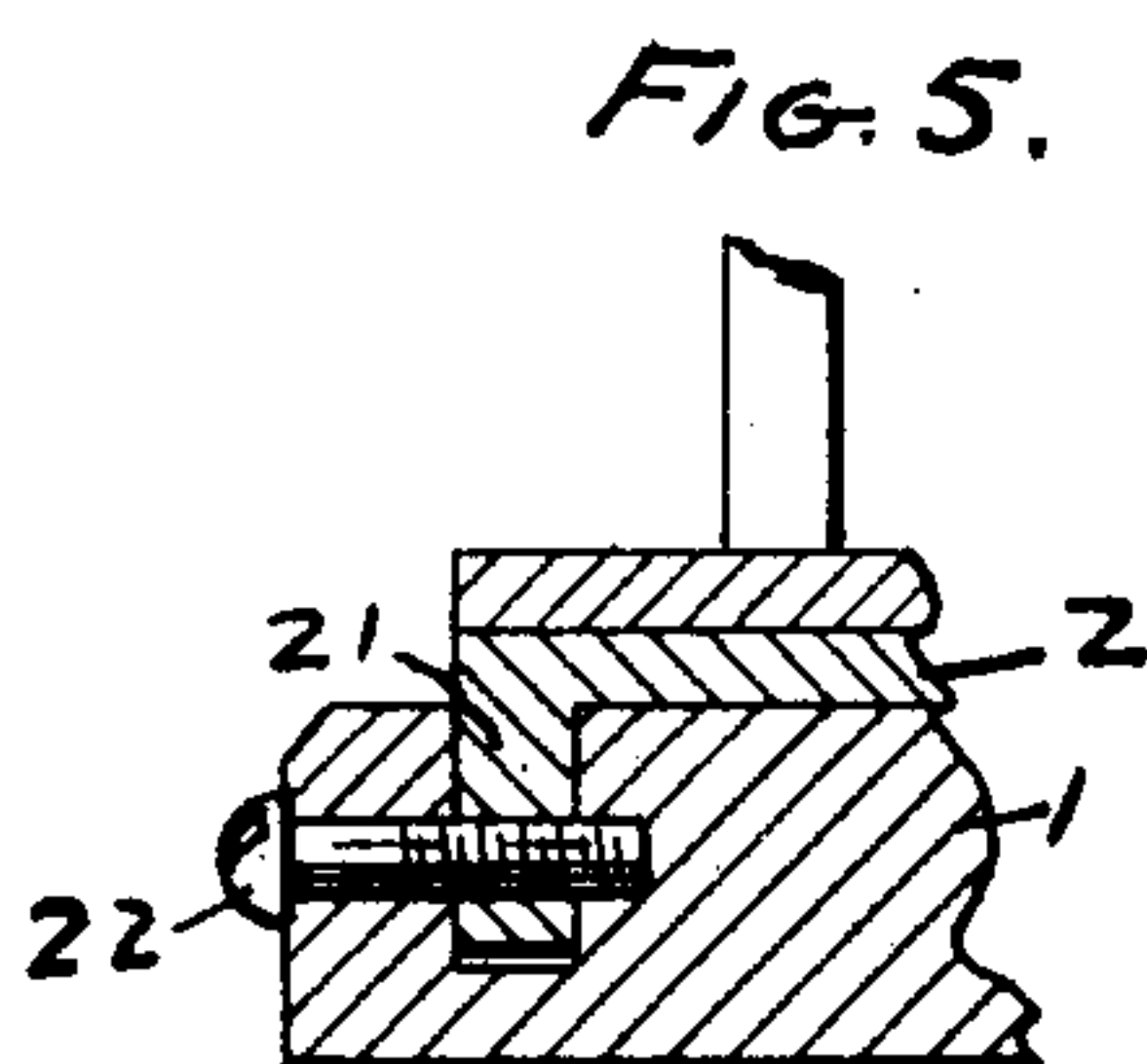
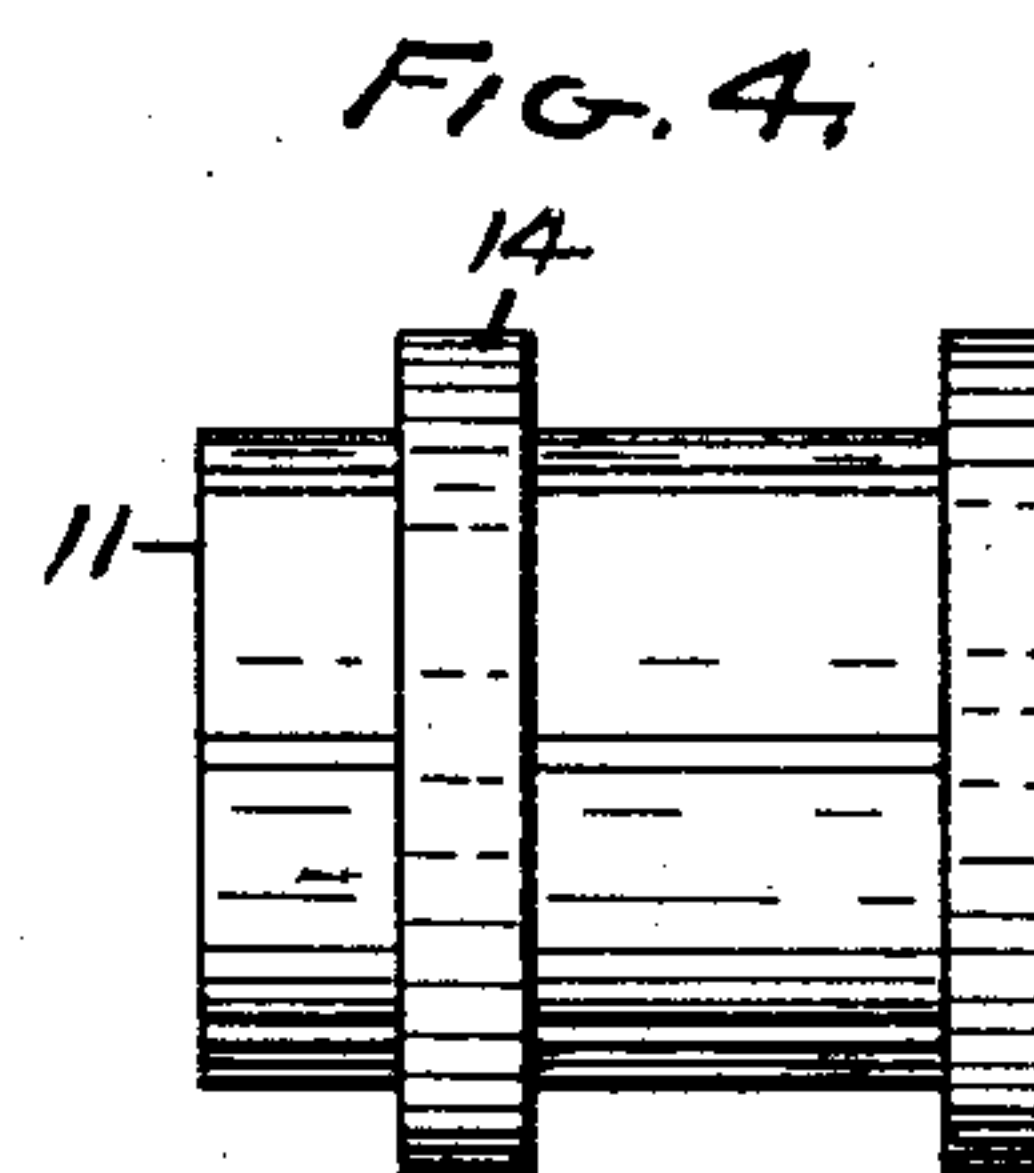
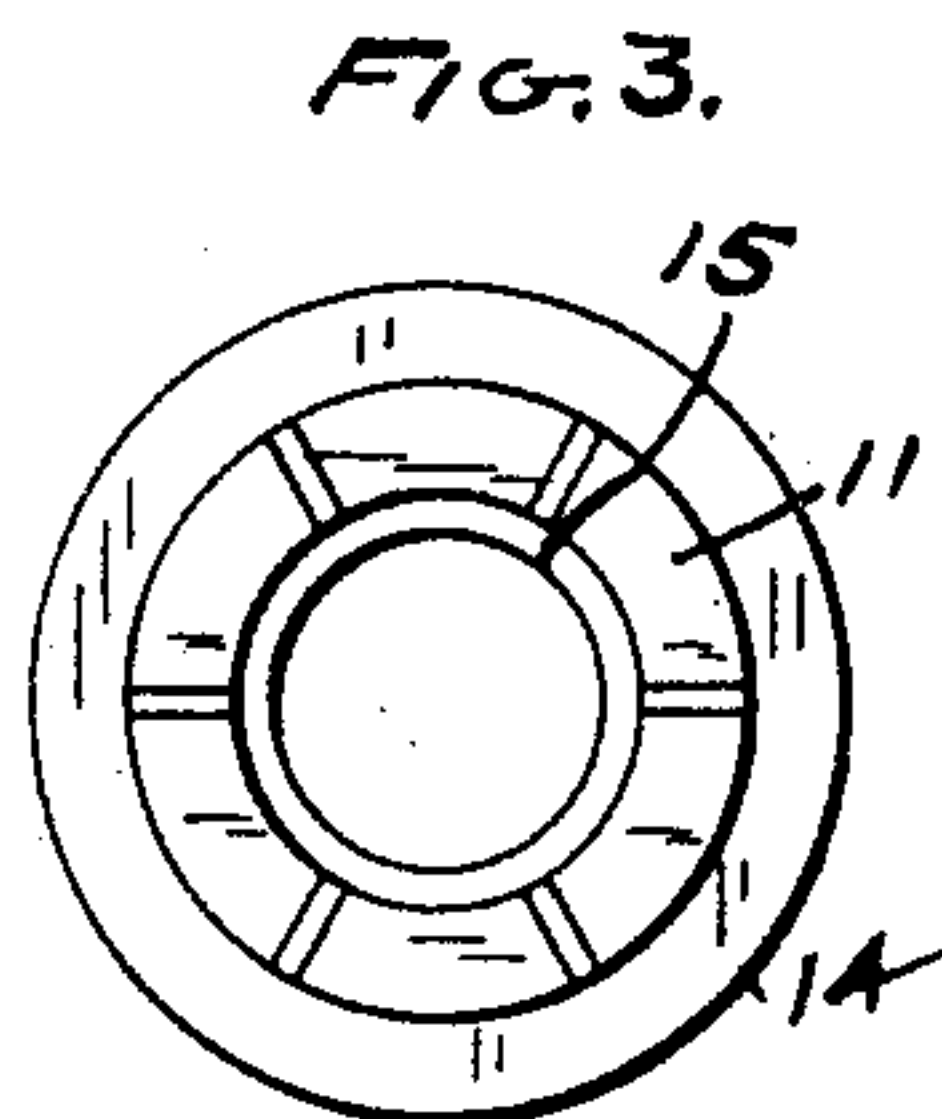
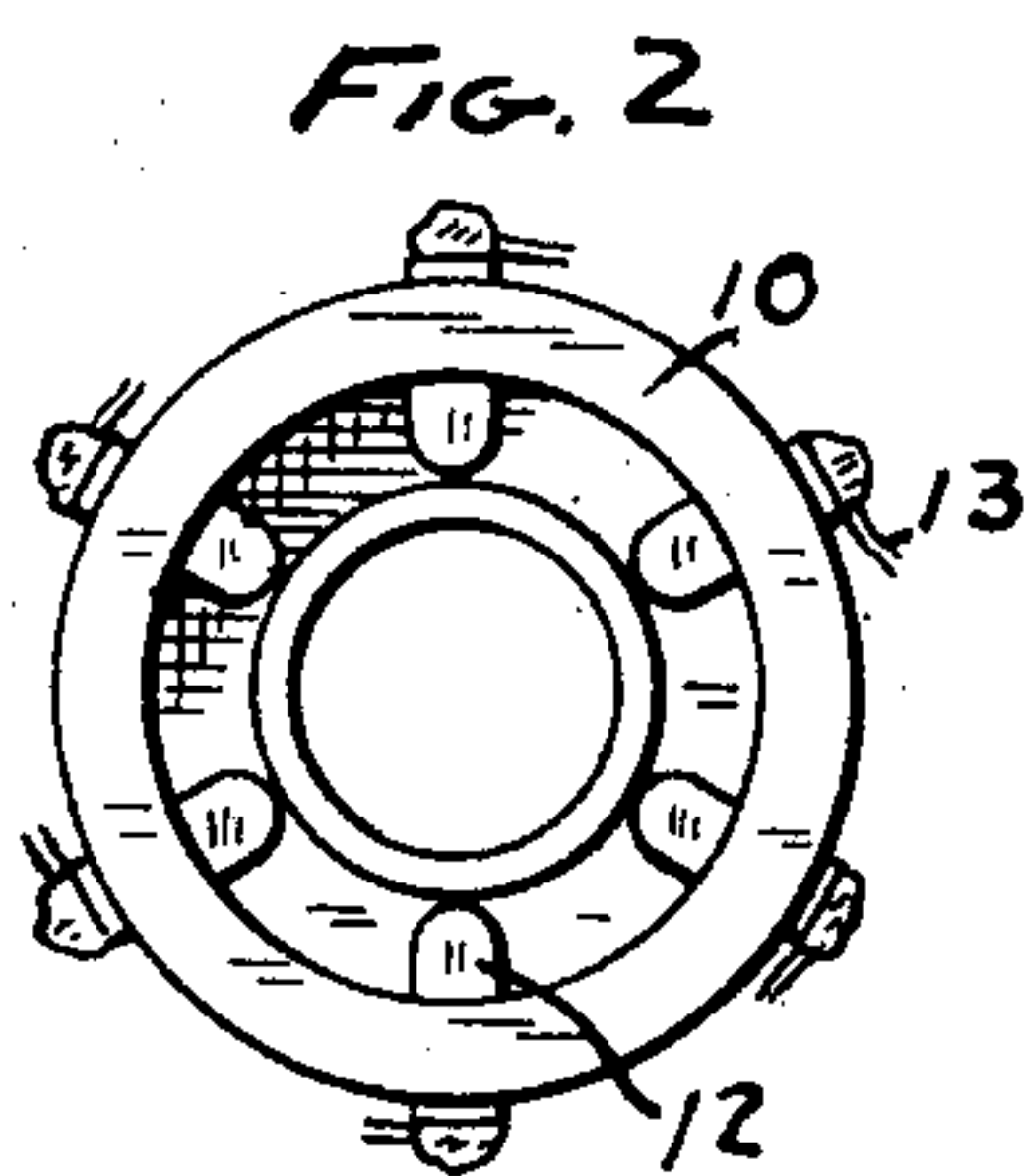
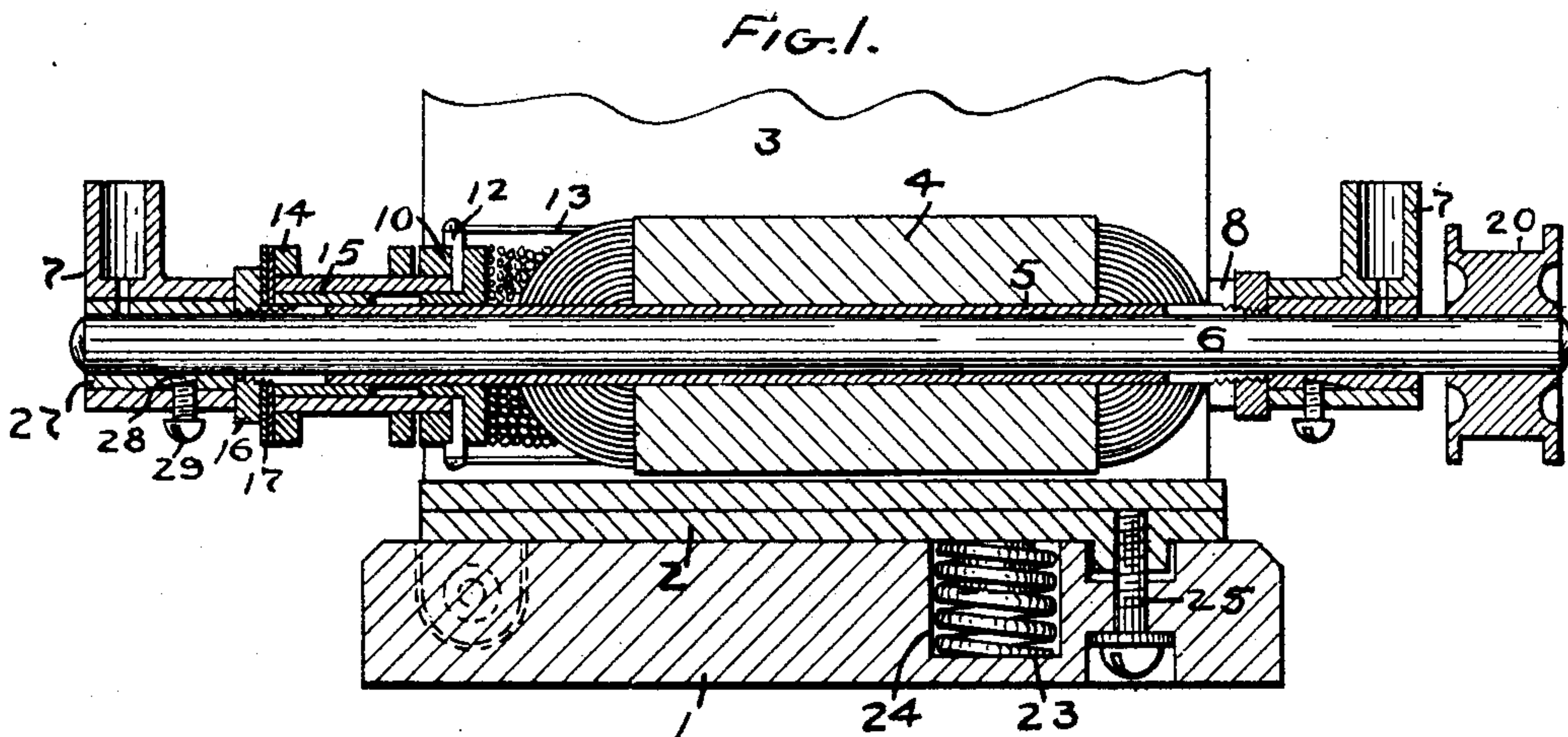


No. 688,401.

Patented Dec. 10, 1901.

J. E. EVERETT.
ELECTRICAL APPARATUS.
(Application filed Feb. 21, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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ELECTRICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 688,401, dated December 10, 1901.

Application filed February 21, 1901. Serial No. 48,217. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. EVERETT, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Electrical Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like figures refer to like parts.

This invention relates to improvements in electric machines, such as dynamos and motors.

The chief novel feature of this invention is the commutator attachment.

Heretofore conductors from the armature have been secured directly and permanently to the bars of the commutator. Consequently when the commutator becomes worn in such arrangement it is necessary either to replace the old armature and commutator with new ones or to go to the trouble of separating the permanent connections between the armature-conductors and the commutator-bars, replace the old commutator with a new one, and permanently secure the armature connections directly with the bars of the new commutator. Detachable commutators have also been made; but in all of them a special construction of the commutator has been necessary.

One object of my invention is to overcome this difficulty by permanently connecting the armature-conductors with a series of contact-pieces, one for each commutator-bar, mounted in a stationary collar, the contacting faces of said contact-pieces being in exactly the same plane, so that the ordinary make of commutators can be slipped up against it and held against it by a nut at the other end. When a commutator, therefore, is worn out, it can be taken off and another one like it immediately slipped into place against the contact-piece.

Another important feature of this invention consists in the mounting of the device on the stationary base, so that the same device may be employed whether the shaft is driven by a belt or friction-pulley. Such devices heretofore have been so made that a different construction was needed if the shaft was to be

driven by a pulley or by a belt. I accomplish this object by pivoting the device at one end to the base and supporting the end of the device carrying the driving-pulley on a vertically-acting spring and also providing a screw-bolt at such end for holding the device rigidly down upon the base. When the belt is used, this screw-bolt is tightened up tight and holds the device absolutely stationary. When the friction-wheel is used to transmit power to the shaft, the screw-bolt is loosened somewhat to permit vertical play by reason of the spring to the pulley on the shaft, and this keeps it always in contact with the friction-pulley.

The object of this invention, therefore, is to so arrange and construct those parts which wear out quickly that they may be easily replaced without changing the whole device or any of the parts which do not wear out quickly.

The full nature of this invention will be understood from the accompanying drawings and the following description and claims.

In the drawings, Figure 1 is a central vertical section through the apparatus; parts being broken away. Fig. 2 is an end elevation of the collar carrying the contact-pieces for making electrical connection between the armature-conductors and the commutator-bars. Fig. 3 is an end elevation of the commutator. Fig. 4 is a plan of the same. Fig. 5 is a cross-section through a part of the base, showing the means for pivoting the device thereon. Fig. 6 is a plan of one end of the sleeve on which the armature is mounted, showing the split end thereof.

In detail, 1 is a base, which for small apparatus may be made of wood.

2 is a plate to which the frame 3 is secured. The armature 4 is mounted in said frame upon the sleeve 5, that is secured to the shaft 6, which is mounted in the bearings 7, that are carried by a pair of horizontal arms 8, extending from the frame 3, only one of said arms appearing in the drawings, the remainder of said arms being hidden in the views therein presented.

The construction of the armature and winding, the frame 3, bearings 7, and the means for supporting said bearings 7 constitute no part

of this invention and may be of any suitable form.

On the sleeve 5, at the left end as the device appears in Fig. 1, there is mounted a collar 10, made of hard rubber or other insulating material and secured in any suitable way to said sleeve, so as to be permanently mounted. The end elevation of said collar appears in Fig. 2. It has a central opening for the sleeve 5 and is centrally cut out to form an annular recess about the central opening, leaving a rim. This annular recess is adapted to receive the end of the commutator 11. A number of contact-pieces 12 are secured in said collar 10, so as to extend radially through the rim thereof and be substantially equidistant from each other. The conductors 13 from the armature are permanently secured to the outer ends of these contact-pieces. The contact-pieces are made of brass or any other good conductor and are arranged in the same plane, which plane intersects the center of the collar or the axis of the shaft 6 at a right angle. As appears in Fig. 2, the inwardly-extending ends of these contact-pieces have an outwardly-exposed face. Said contact-pieces are faced by turning or grinding by a suitable tool, so that the exposed faces of the inner ends thereof will be true to the same plane intersecting the center of the collar and the axis of the shaft at a right angle. This is important, as will hereinafter appear.

The commutator is not new, that shown consisting of six bars separated by a suitable insulating material and held together by the rings 14. There is an inner lining of rubber or insulating material 15. The commutator is slipped over the sleeve 5, as shown in Fig. 1. The inner end is ground perfectly true to a plane intersecting its center or axis of the shaft 6 at a right angle, so that when the commutator is slipped into place its inner end will enter the annular recess of the collar and each bar of the commutator will contact with the exposed face on the inner end of its corresponding contact-piece 12. To make this contact complete and perfect the commutator is forced into and against the collar 10 by the nut 16, that screws up on the threaded end of the sleeve 5 against suitable washers 17. When this nut is screwed up tightly into place, it holds the commutator firmly against the contact-pieces and makes a complete electrical connection between the armature and the commutator. When a commutator is worn out or needs to be removed, all that is required is to remove the nut 16, take off the commutator, immediately slip another in its place, (which new one may be kept in stock,) and in a minute the machine will be as good as new so far as the commutator attachment is concerned. This is important especially with sparking apparatus for gas-engines and other lighter forms of dynamos and motors.

The plate 2 has at the end farthest away

from the driving-pulley 20 a downwardly-extending perforated ear 21, that fits in a corresponding recess in the base 1, and a transverse opening in said base is provided that corresponds with the opening in the ear 21, so that the screw-bolt 22 may be inserted therein to form a hinge or pivot. There is a pair of ears 21 and bolts 22, one on each side at the left end of the machine, as shown in Fig. 1, the same appearing therein in dotted lines. This arrangement permits the vertical movement of the end of the shaft carrying the driving-pulley. To force said end of the shaft upward, the spiral expansion-spring 23 is embedded in a suitable recess 24 in the base 1 and presses upward against the under side of the plate 2 and tends to force the driving-pulley 20 up against the friction-wheel for transmitting power to it when a friction-wheel is used for such purpose. No friction-wheel is here shown, as it constitutes no part of this invention. This vertical play or movement of the end of the device carrying the driving-pulley is limited by the screw-bolt 25, that extends through the base 1 into the plate 2. By loosening said bolt somewhat opportunity for the vertical play by reason of the spring is permitted. When, however, the driving-pulley is to be actuated by a belt and such vertical play is not desired, the bolt 25 is tightened, as shown in Fig. 1, which holds the device secure. With this arrangement, therefore, the same device may be used whether the power is to be transmitted to the shaft by a belt or a friction-wheel, both of which means are very common.

The shaft 6 is made readily removable when it is worn by providing the sleeve 5, through which said shaft extends and is clamped in the sleeve. The ends of the sleeve are slitted three or four times, said slit 26 appearing in Fig. 6, and also beveled. The nut 16 has an internal bore less than the external diameter of the sleeve, so that as said nut is screwed up in the beveled end of the sleeve it will compress the split end of the sleeve down tight about the shaft 6 and secure the two together. By loosening the nut 16 the shaft can be readily removed and another inserted in its place without changing any of the other parts of the machine. Likewise removable bushings or bearing-sleeves 27 are provided in the bearing 7 with a notch 28 on the under side, into which a little screw 29 extends. When the bushing is worn, by loosening the screw 29 it can be removed and another one put in its place without changing any of the other parts of the machine. The sleeve 5 is secured rigidly on the shaft by the compressing-nuts 16, one at each end.

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

1. In an electrical apparatus, a commutator, and support for the commutator, a series of contact-pieces mounted independently of the commutator in a position to be engaged by the bars thereof, and a nut on the commu-

tator-support that acts against the other end of the commutator for forcing and holding the commutator tightly against said contact-pieces.

5 2. In an electrical apparatus, the combination of a sleeve with external threads thereon, a collar rigidly secured thereon and made of insulating material, a series of contact-pieces secured in the collar and radiating in
10 the same plane from said sleeve, a commutator, insulating material within the commutator and mounted on the sleeve, and a nut that screws up on the threaded portions of the sleeve against one end of the commutator to
15 force and hold the other end against said contact-pieces.

3. In an electrical apparatus, a shaft for a dynamo or motor, spring-controlled means for mounting the dynamo or motor so that the

driven end of the shaft will have vertical play 20 or movement, and means for limiting the movement of such spring-controlled support.

4. In an electrical apparatus, a frame for a dynamo or motor, a shaft carried in said frame, means on one end of said shaft for 25 driving it, a base upon which such frame is mounted, means for pivotally connecting said frame at one end to said base, a spring-support for the other end of said frame, and a screw-bolt extending through the base into 30 said frame for adjusting the position thereof.

In witness whereof I have hereunto affixed my signature in the presence of the witnesses herein named.

JOHN E. EVERETT.

Witnesses:

FLORENCE E. BRYANT,
V. H. LOCKWOOD.