Feb. 12, 1957 T. H. HOY 2,780,949

BRUSH RETRACTORS

Filed Aug. 18, 1953

FIG. 1

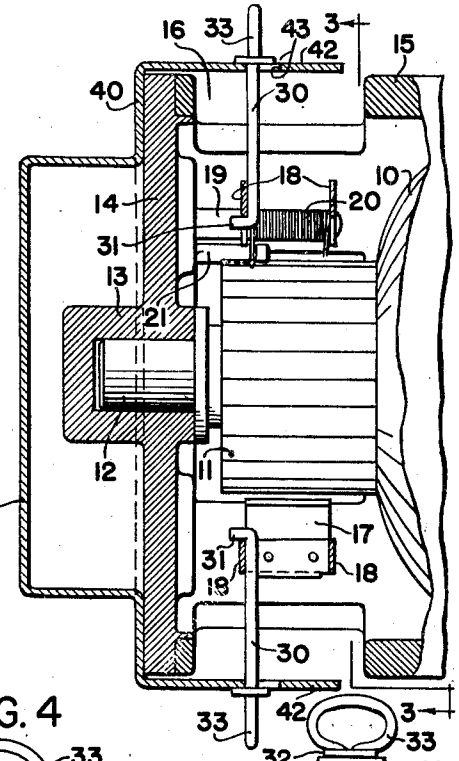


FIG. 2

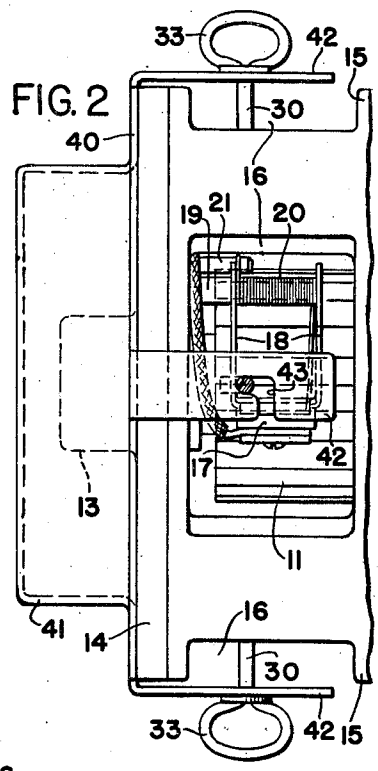


FIG. 4

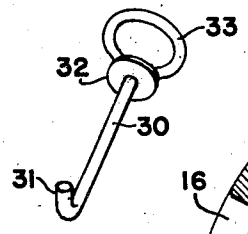


FIG. 3

INVENTOR.
THOMAS H. HOY

BY Jas. C. Hobenswith

ATTORNEY

United States Patent Office 2,780,949
Patented Feb. 12, 1957

2,780,949

BRUSH RETRACTORS

Thomas H. Hoy, Jenkintown, Pa.

Application August 18, 1953, Serial No. 374,892

4 Claims. (Cl. 81—3)

This invention relates to brush retractors, that is to devices for retracting the spring tensioned brushes of electrical apparatus, such as generators and starting motors, and particularly those used in the electrical systems of automobiles.

When an automobile generator or starting motor is taken apart, for the purpose of repairs, there is always considerable difficulty in reassembling the same by reason of the necessity to retract the brushes, against the tension of their respective springs, a sufficient distance to enable the brushes to clear the end of the commutator when the armature is replaced.

Numerous efforts have been made to provide means for overcoming this difficulty but none of the devices heretofore suggested for this purpose have proved entirely satisfactory.

The principal object of the present invention is to provide a device, of a relatively inexpensive character, which may be used for the purpose of retracting the generator brushes, and for holding the same a sufficient distance from the axis of the rotation of the armature so that the brushes will be held away from the commutator as the parts are being assembled.

The nature and characteristic features of the present invention will be more readily understood from the following description, taken in connection with the accompanying drawing forming part hereof, in which:

Figure 1 is a sectional view of one end of a generator, of a type commonly used in automobiles and the like for the purpose of supplying electrical current to the ignition system for recharging the storage battery forming part of the electrical system, certain of the internal parts being shown in elevation, and having a device embodying the main features of the present invention shown in connection therewith;

Fig. 2 is an external elevational view of the parts shown in Fig. 1;

Fig. 3 is a transverse sectional view taken approximately on the line 3—3 of Fig. 1; and

Fig. 4 is a perspective view of one of the hook-like brush retractor devices employed.

It should, of course, be understood that the description and drawing herein are illustrative merely, and that various modifications and changes may be made in the devices shown without departing from the spirit of the invention.

Referring to the drawing, there is therein shown one end of a typical and common form of generator, of the type commonly used in automobiles as a part of the ignition system thereof and for recharging the storage battery.

In such generators there is provided an armature **10** of an ordinary type and a commutator **11** associated therewith, the same being mounted on a shaft **12**, the end of which is journaled in a suitable bearing **13** provided in the center of the head member **14** of the generator. The head member **14** is mounted on the end of the casing **15**

of the generator. At the end of the casing **15**, adjacent the head member **14** there is provided a plurality of openings **16**, one for each of the brushes **17** so as to permit access thereto for making certain minor adjustments which may be done without dismantling the generator.

The openings **16** are ordinarily closed by means of a band encircling that portion of the generator casing **15** which, however, is not shown, as the same forms no part of the present invention, and which is customarily removed whenever required to permit access to the parts of the brush assembly.

Each of the brushes **17** of the generator is mounted on the end of a carrier arm **18** which is pivotally mounted on a pin **19** extending from the head member **14**. A spring **20** is coiled around the pin **19** and has one end bearing against a part of the outer end portion of the carrier arm **18** to which the brush **17** is attached. The other end of the spring **20** is anchored on another pin **21** extending from the head member **14**.

The springs **20** normally impel the brushes **17** carried by the carrier arms **18** toward the surface of the commutator **11** and there is sufficient freedom of movement of the brushes inwardly so that the same will ordinarily be positioned within the normal location of the surface of the commutator whenever the head member **14** carrying the brushes is removed from the end of the casing **15**, or in the alternative, when the armature is removed from the casing.

The device of the present invention comprises, for each of the brush units, a retractor member comprising primarily a rod **30** having one end bent over substantially at right angles, as at **31**, to provide a hook which is adapted to engage a portion of one of the brush carrier arms **18**.

There is also provided a supporting device which may be formed from heavy sheet metal and which comprises an annular part **40** and an offset central portion **41** which is provided for the purpose of clearing the projecting portion of the bearing **13** of the head member **14** of the generator, and also to facilitate the handling of said supporting device. The supporting device is adapted to be mounted on the head member **14** of the generator.

From the rim of the annular part **40** of the supporting device there extends a plurality of arms **42**, one for each of the brush units. Said arms **42** are integral with or otherwise fixedly connected to the part **40** of the supporting device. Each of said arms **42** is provided with a bayonet slot **43** extending in from one side thereof, and the inner end of said slot is suitably located for proper coaction of the parts as will hereafter be more apparent.

At the outer end of each retractor member there is provided a shoulder **32** and a handle portion **33**. The shoulder **32** is so located that when the rod **30** of a retractor member is inserted in one of the openings **16** in the end of the generator casing **15** and the bent over hook portion **31** at the inner end of said rod **30** is caused to engage the brush carrier arm **18**, the rod **30** of the retractor member may then be inserted sidewise in the bayonet slot **43** and, when located at the inner end thereof, the shoulder **32** will serve to maintain the brush holder in proper position to cause the brush to be retracted outwardly whereby the brush will clear the surface of the commutator.

It should, of course, be understood that one of the retractor members is provided for each of the brush units, and that when all four of the brushes are retracted as aforesaid the armature may be removed from the casing without any danger of the brushes being impelled inwardly to positions where it would not be possible to replace the armature by reason of the brushes forming an obstruction to the reinsertion of the armature.

On the other hand, if repairs or adjustment are required only in connection with the brushes or their supporting or associated parts, the head member **14** may be removed from the end of the casing **15** in which the commutator is located. In this instance, the brushes may be left to be impelled inwardly by their springs after the head is removed with the brush assemblies carried thereby.

When, however, it is desired to replace the head member, with the brush assemblies carried thereby, the device of the present invention is placed in its operative relationship on the head member **14**. The retractor members are then caused to engage the brush carrier arms **18** and the brushes **17** are retracted by mounting the retractor members in the arms **42** of the supporting device as aforesaid.

The head member **14** may now be partially replaced until the retractor members engage the end face of the casing **15** at which time the brushes which are held by the retractor members will be partially overlapping the end of the commutator, and the end of the armature shaft **12** will be within the bearing **13** provided in the head member **14**. The retractor members may now be moved, which will permit the brushes to contact the commutator at the end portion thereof, whereby it will be possible, after removal of the retractor members, to push the head member to its final position on the end of the casing and thus cause the brushes to be properly located over the middle portion of the commutator.

It has been found that, in the use of the foregoing device the assembling of the generators and the like, used in automobile ignition systems, either initially or after repair, will be greatly expedited by reason of the facility afforded through the proper holding of the brushes in the retracted positions thereby to permit the parts to be quickly brought to their proper relationship.

I claim:

1. A brush retractor for use in the assembly of electrical generators and the like comprising, for each of the brush units, a separate manually operable retractor member having a hook portion for engaging a portion of the brush tholder, and a supporting device adapted to be mounted on the end plate of the generator housing, said supporting device having a plurality of arms each extending when said supporting device is in its operative position at a fixed radial distance from and substantially parallel to the axis of the generator armature, each of said arms having a slot therein for the reception of a retractor member, and each of the retractor members having a shoulder adapted to bear against the outer face of the arm of the supporting device, when the retractor member is in its operative position in the slot of said arm, thereby to hold the brushes in retracted positions clear of the commutator of the generator armature.

2. A brush retractor for use in the assembly of electrical generators and the like comprising, for each of the brush units, a separate manually operable retractor member comprising a rod having one end bent over to provide a hook for engaging a portion of the brush holder,

and a supporting device adapted to be mounted on the end plate of the generator housing, said supporting device having a plurality of arms each extending when said supporting device is in its operative position at a fixed radial distance from and substantially parallel to the axis of the generator armature, each of said arms having a slot therein for the reception of a retractor member, and each of the retractor members having a shoulder adapted to bear against the outer face of the arm of the supporting device, when the retractor member is in its operative position in the slot of said arm, thereby to hold the brushes in retracted positions clear of the commutator of the generator armature.

3. A brush retractor for use in the assembly of electrical generators and the like comprising, for each of the brush units, a separate manually operable retractor member comprising a rod having one end bent over to provide a hook for engaging a portion of the brush holder, and a supporting device adapted to be mounted on the end plate of the generator housing, said supporting device having a plurality of arms each extending when said supporting device is in its operative position at a fixed radial distance from and substantially parallel to the axis of the generator armature, each of said arms having a slot therein for the reception of a retractor member, and each of the retractor members having a shoulder adapted to bear against the outer face of the arm of the supporting device, when the retractor member is in its operative position in the slot of said arm, thereby to hold the brushes in retracted positions clear of the commutator of the generator armature.

4. A brush retractor for use in the assembly of electrical generators and the like comprising, for each of the brush units, a separate manually operable retractor member comprising a rod having one end bent over to provide a hook for engaging a portion of the brush holder, and a supporting device adapted to be mounted on the end plate of the generator housing, said supporting device having a plurality of arms each extending when said supporting device is in its operative position at a fixed radial distance from and substantially parallel to the axis of the generator armature, each of said arms having a bayonet slot extending in from one side thereof for the reception of a portion of a retractor member, and each of the retractor members having a shoulder adapted to bear against the outer face of the arm of the supporting device, when the retractor member is in its operative position in the slot of said arm, thereby to hold the brushes in retracted positions clear of the commutator of the generator armature.

References Cited in the file of this patent

UNITED STATES PATENTS

1,986,093	Abernathy	Jan. 1, 1935
2,043,546	Koenig	June 9, 1936
2,249,396	Riccio	July 15, 1941
2,472,018	Johnson	May 31, 1949
2,495,430	Stroburg	Jan. 24, 1950