Feb. 27, 1923. 1,446,982.

M. MAURAN.

COMMUTATOR GRINDING MACHINE.

FILED SEPT. 2, 1921. 3 SHEETS—SHEET 1.

Fig. 1.

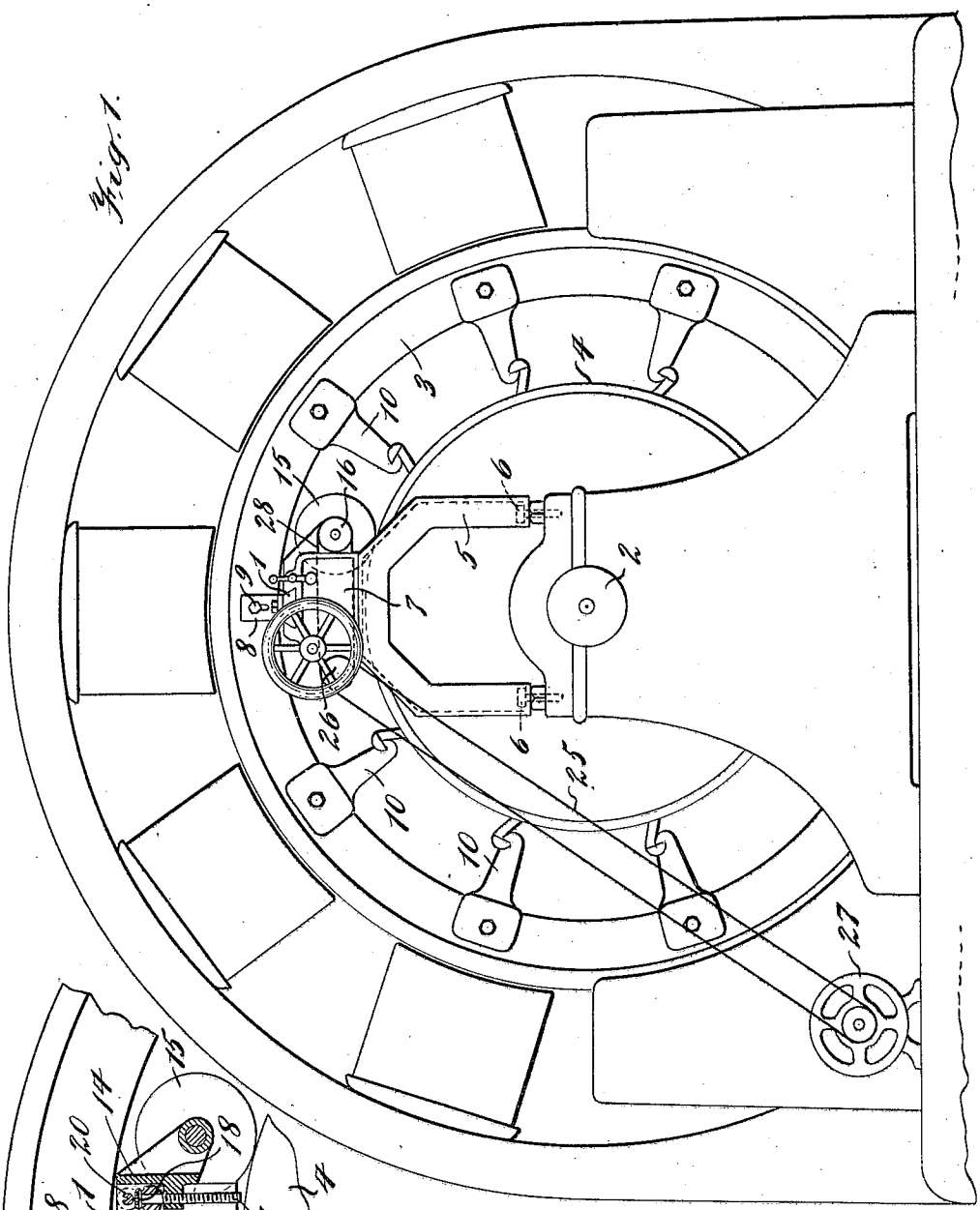


Fig. 4.

INVENTOR.

Max Mauran

BY

Rosenbaum, Stockbridge & Boost

ATTORNEYS.

Feb. 27, 1923. 1,446,982.

M. MAURAN.

COMMUTATOR GRINDING MACHINE.

FILED SEPT. 2, 1921. 3 SHEETS—SHEET 2.

Fig. 2.

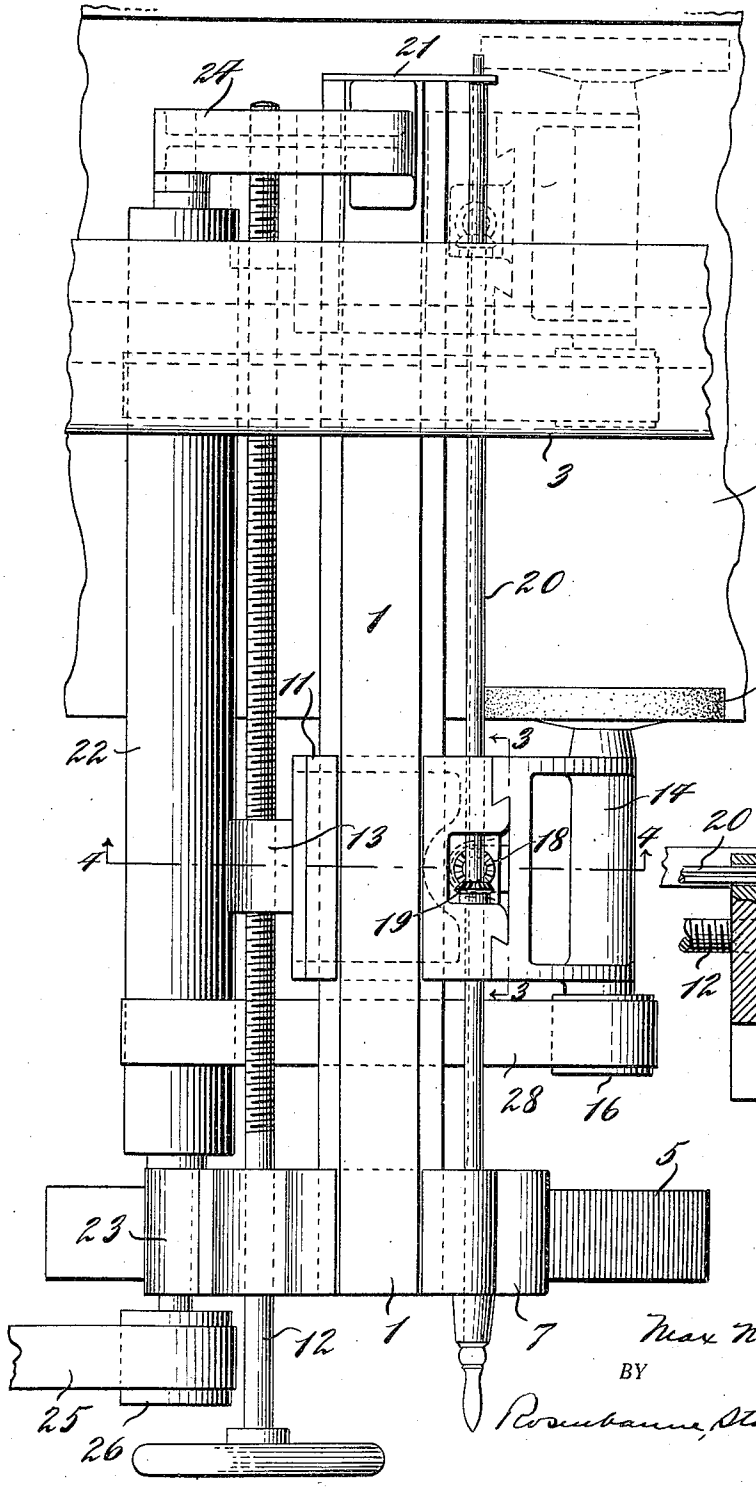
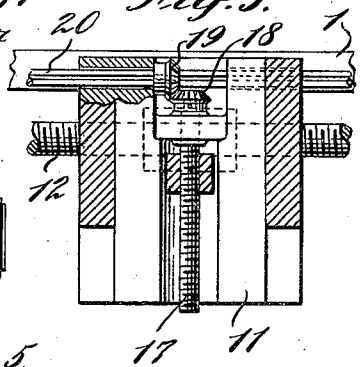


Fig. 3.



INVENTOR.

Max Mauran

BY

Rosenbaum, Stockbridge & Boost

ATTORNEYS.

Feb. 27, 1923. 1,446,982.

M. MAURAN.

COMMUTATOR GRINDING MACHINE.

FILED SEPT. 2, 1921. 3 SHEETS—SHEET 3.

Fig. 5.

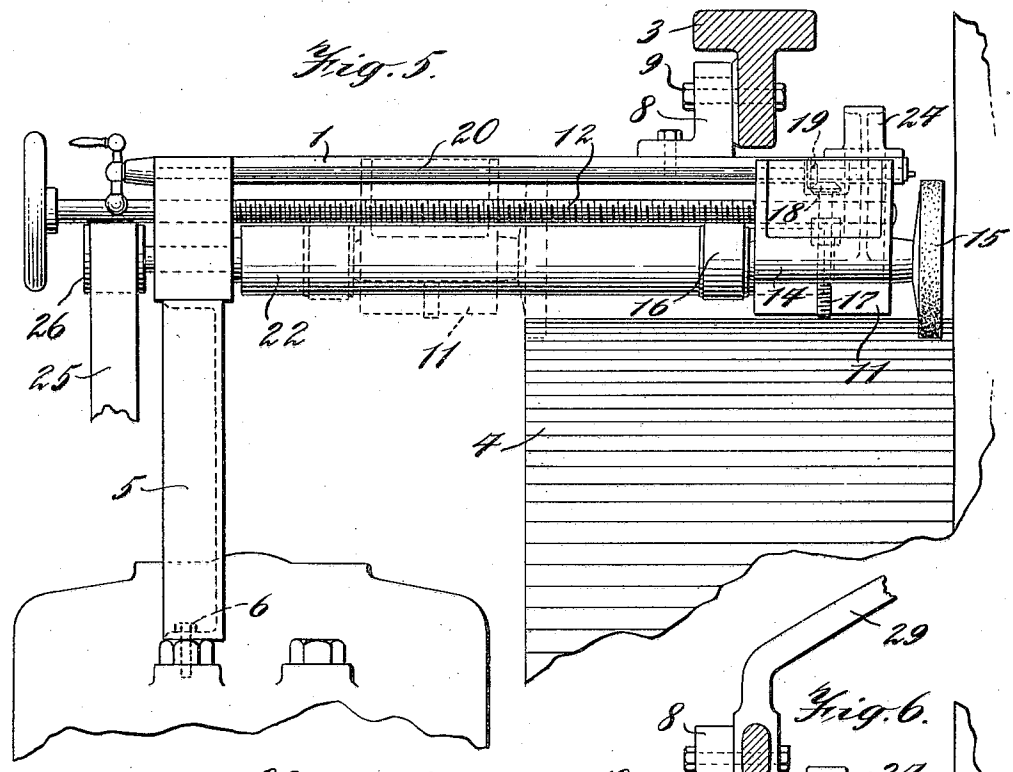
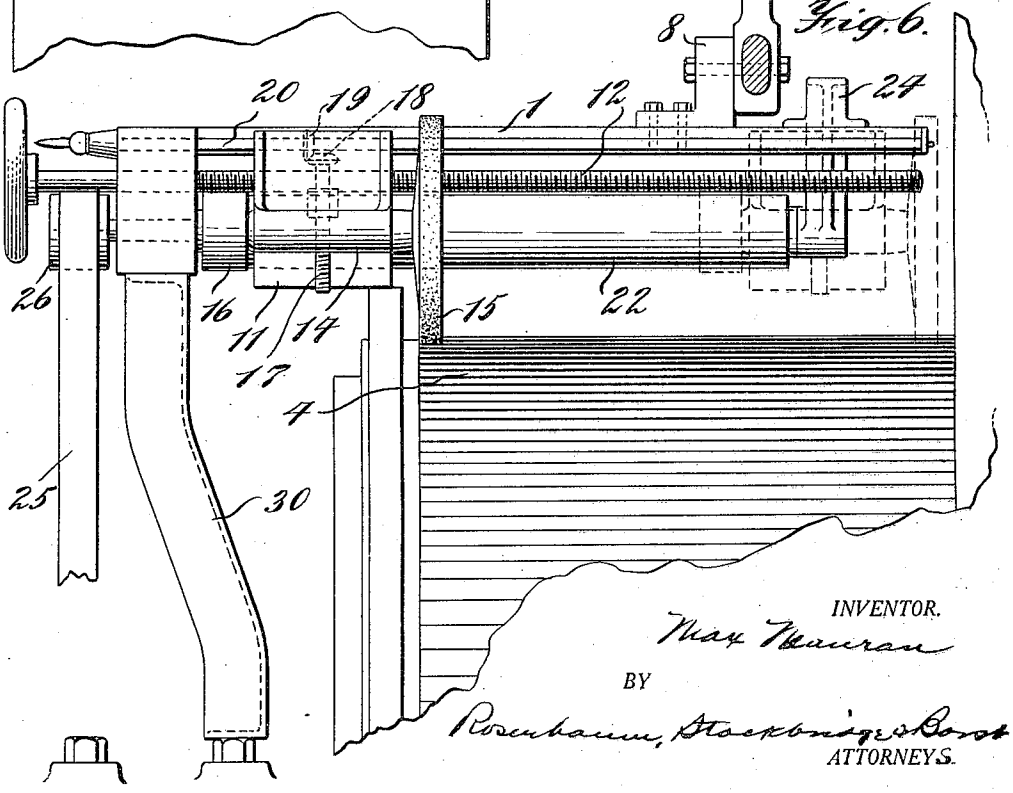


Fig. 6.



INVENTOR.

Max Mauran

BY

Rosenbaum, Stackbridge & Boost

ATTORNEYS.

Patented Feb. 27, 1923. 1,446,982

UNITED STATES PATENT OFFICE.

MAX MAURAN, OF NIAGARA FALLS, NEW YORK, ASSIGNOR TO MATHIESON ALKALI WORKS, INC., A CORPORATION OF VIRGINIA.

COMMUTATOR-GRINDING MACHINE.

Application filed September 2, 1921. Serial No. 497,921.

To all whom it may concern:

Be it known that I, MAX MAURAN, a citizen of the United States, residing at Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Commutator-Grinding Machines, of which the following is a full, clear, and exact description.

My invention relates to devices for truing the commutators and collector rings of dynamo-electric machines, and particularly to that type of device which is designed for attachment to the machine itself, thus avoiding the necessity of removing the collector members from the machine for the purpose.

An object of my invention is to provide a device of this character which may be readily applied for use on any of the well known forms of dynamo-electric machines, without interference with any of the parts and without requiring any dismantling of the machine. Another object of my invention is rigidity of the parts when the device is attached and in use. Another object is to protect the bearings of the grinding shaft throughout the adjustment of the grinder. Other objects are simplicity and durability of construction, accuracy and reliability in operation, and facility in manipulation. Still other objects and advantages of my invention will appear from the following description.

In accordance with my invention I construct the slide on which the carriage travels so that it may be attached at both its ends and held rigidly, thereby avoiding any chattering during the grinding operation. The outer end may conveniently be carried by a support which is attachable to some part of the machine frame, as to the bearing box of the armature, while the inner end may be attached to the brush support, one of the brushes being removed for the purpose. One of these end attachments is preferably made adjustable to facilitate the arrangement of the slide parallel to the axis of the commutator.

To obtain adjustably of the grinder both longitudinally of the commutator face and also toward and from the commutator, while at the same time preventing any grit from getting into the grinder bearings in any position of adjustment, my invention further contemplates a special type of carriage which is fed along the slide by a manually operated feed screw, and which includes a grinding or bearing head which is adjustable up and down relative to the rest of the carriage by a suitable adjusting device.

To drive the grinder throughout its range of adjustment, I have found it satisfactory to use a drum disposed parallel to the slide and driven from some suitable source of power, and to belt a pulley on the grinder shaft to this drum.

My invention also includes various other features of construction and arrangements and combinations of parts as will hereinafter more fully appear.

I shall now describe the illustrated embodiment of my invention and shall thereafter point out my invention in claims.

Fig. 1 is an end view of a dynamo-electric machine with a truing device embodying my invention attached thereto.

Fig. 2 is a plan of the truing device and a portion of the machine to which it is attached;

Fig. 3 is a section of the carriage taken on line 3—3 of Fig. 2;

Fig. 4 is a transverse section on reduced scale of the truing device on line 4—4 of Fig. 2;

Fig. 5 is a side elevation of the parts shown in Fig. 2;

Fig. 6 is a view similar to Fig. 5 showing the truing device attached to a slightly different type of dynamo-electric machine.

In the adaptation of my invention shown in the drawings the slide 1 is supported at its outer end by the bearing box of the armature shaft 2 and at its inner end by the brush ring 3 which encircles the commutator 4 substantially centrally thereof.

A support for the outer end of the slide consists of an angle iron frame 5 of substantially inverted U-shape which is designed to fit upon the bearing box and has holes in its feet adapted to receive the bolts 6. Secured to the top of the frame 5 is a guide support 7.

The support for the inner end of the guide 1 is an angle member 8 which is provided in its upright part with a slot adapted to receive the screw 9 of one of the brush holders 10, the brush holder being removed for the purpose. The slot in the angle member permits of raising and lowering the inner end of the slide to effect parallelism with the

axis of the armature. This device is therefore easily applied to the dynamo electric machine without the necessity of removing any part except one of the brush holders.

A carriage 11 is provided at its top with a dove-tail groove fitting over the slide 1, and this carriage is translated along the slide by a feed screw 12 which bears in the guide support 7 and engages in a threaded nut portion 13 on one side of the carriage 11. The carriage 11 is provided on its front face with a vertical dove-tail guide tongue over which fits the complimentary grooved face of a vertically adjustable bearing head 14. The shaft of a rotative grinding disc 15 has its bearings in the bearing head 14. A driving pulley 16 is provided on the outer end of the grinding disc shaft.

To adjust the grinding wheel 15 toward and from the commutator 4, suitable means are provided to adjust the bearing head 14 upon its guides on the carriage 11. These means include a screw 17 the upper end of which is plain and bears in a lateral projection on the carriage 11 and the lower threaded end of which engages in a threaded lug on the inner face of the head 14. To operate the screw 17 bevel gears 18 and 19 are provided, the former of which is secured on the upper end of the screw 17 while the latter is splined on a manually operated shaft 20 extending parallel to the slide 1 on the side opposite the feed screw 12, and bearing at one end in the slide support 7 and at the other end in a plate 21 secured on the inner end of the slide 1. These bevel gears 18 and 19 are disposed in a recess in the top face of the carriage 11, and it is therefore apparent that as the feed screw 12 is turned and the carriage is thereby moved along the slide 1, the bevel gear 19 will travel with the carriage, which movement of the bevel gear is permitted by reason of its being splined upon the shaft 20.

To drive the grinding disc 15 throughout its range of adjustment, a drum 22 is provided, the shaft of which bears at its outer end in a bearing 23 attached to the side of the slide support 7, and bears at its inner end in a shaft hanger 24 secured to the inner end of the slide 1. Power is supplied to this drum 22 in any suitable manner, as by a belt 25 on a pulley 26 on the end of the drum shaft, which belt may be driven by an electric motor 27. A belt 28 connects the drum 22 with the pulley 16 on the grinding disc shaft.

It is now apparent that the grinding disc may be fed across the face of the commutator from the position shown in full lines to that shown in dotted lines, by turning the feed screw 12, for which purpose a hand wheel, as shown, may be provided on the end of the feed screw. The adjustment of the grinding disc 15 toward and from the commutator surface in any position of the carriage is effected by turning the shaft 20, a suitable crank being provided on the outer end of the shaft for that purpose. Since there is no longitudinal adjustment of the grinding disc shaft in its bearings, there is no opportunity for grit to get into the bearings at any time. The grinding disc is of such a size as to pass freely underneath the brush ring 3, and it will be observed that there is no interference with the belt 28 by any of the parts of the dynamo electric machine. The device may therefore be easily and quickly applied without the necessity of any dismantling of the machine.

In Fig. 6 the device is shown as applied to a little different type of dynamo electric machine in which the commutator is of different proportions and in which the brushes are supported on brush arms instead of on the brush rings encircling the commutator. The angle member 8 which supports the inner end of the slide may, as shown, be attached to the brush arm 29 after removing the brush therefrom in precisely the same manner as it is attached to the brush ring 3 of the former construction. Instead of the frame 5 for the slide support at the outer end of the device, a frame 30 will be used which is bent so as to bring the bottom end of the frame into proper relation to the bolts of the armature bearing box.

It is obvious that various modifications may be made in the construction shown in the drawings and above particularly described within the principle and scope of my invention.

I claim:

1. For dynamo-electric machines having an armature and collector members rotative therewith, means for truing the collector members comprising a slide arranged to extend substantially over the collector members, means for rigidly attaching the slide at both ends to the machine parallel to the armature axis, a carriage operative upon the slide and having a longitudinally extending tongue and groove connection therewith, means to translate the carriage along the slide, and a truing member carried by the carriage.

2. For dynamo-eletric machines having an armature and collector members rotative therewith and a brush supporting element adjacent the collector members, means for truing the collector members comprising a slide arranged to extend substantially over the collector members, means for rigidly attaching one end of the slide to the machine frame and means for rigidly attaching the other end to the brush holding element with the slide parallel to the armature axis, one of said attaching means being adjustable to effect said parallelism of the slide, a carriage operative upon the slide and having a tongue

and groove connection therewith, means to translate the carriage along the slide, a rotative grinding member carried by the carriage, and means for driving the grinding member in all positions of the carriage.

3. For dynamo-electric machines having an armature and bearing therefor, a commutator rotative with the armature and a brush supporting element adjacent the commutator and including a removable attachment for the brush, means for truing the commutator comprising a slide arranged to extend substantially over the collector members, a supporting bracket for the outer end of the slide arranged to be detachably connected to the armature bearing, a slotted supporting member for the inner end of the slide arranged to be adjustably attached to the brush attachment, a carriage operative upon the slide and having a tongue and groove connection therewith, means to translate the carriage along the slide, and a truing member for the collector members carried by the carriage.

4. For dynamo electric machines having an armature and commutator rotative therewith, means for truing the commutator comprising a slide disposed parallel to the axis of the commutator, a carriage movable on the slide, a grinding disc and a shaft therefor carried by the carriage and arranged to be adjusted relative to the carriage toward and from the commutator, and manually operative means for effecting said adjustment of the grinding disc and shaft.

5. For dynamo-electric machines having an armature and commutator rotative therewith, means for truing the commutator comprising a slide disposed parallel to the axis of the commutator, a carriage movable on the slide, a bearing head carried by the carriage and adjustable thereon in a direction toward and from the commutator, a grinding disc and shaft therefor bearing in the bearing head, and a manually operative screw device for adjusting the bearing head.

6. For dynamo electric machines having an armature and commutator rotative therewith, means for truing the commutator comprising a slide disposed parallel to the axis of the commutator, a carriage movable on the slide, a bearing head carried by the carriage and adjustable thereon in a direction toward and from the commutator, a grinding disc and shaft therefor bearing in the bearing head, a screw for effecting the adjustment of the bearing head, an operating shaft extending alongside the slide, and a screw operating gear splined on the shaft and arranged to travel with the carriage in continuous operative engagement with the screw.

7. For dynamo electric machines having an armature and commutator rotative therewith, means for truing the commutator comprising a slide disposed parallel to the axis of the commutator, a support for the outer end of the guide arranged to be attached to the machine frame, a carriage on the guide, a grinding disc and pulley therefor carried by the carriage, a feed screw for the carriage bearing in the guide support and operatively engaging the carriage, a drum extending parallel to the guide and bearing in the guide support, means for rotating the drum, and a driving connection between the drum and grinding disc pulley in all positions of the carriage.

8. For dynamo electric machines having an armature including a commutator and an adjacent brush supporting element, means for adjustably attaching the inner end of the slide to the brush supporting element, a support for the outer end of the guide arranged to be attached to the machine frame, a carriage on the guide, a grinding disc and pulley therefor carried by the carriage, a feed screw for the carriage bearing in the guide support and operatively engaging the carriage, a shaft hanger carried by the inner end of the guide, a drum extending parallel to the guide and bearing at the outer end in the guide support and at its inner end in the shaft hanger, means for rotating the drum, and a driving belt connecting the drum and grinding disc pulley.

9. For dynamo electric machines having an armature including a commutator and an adjacent brush supporting element, means for adjustably attaching the inner end of the slide to the brush supporting element, a support for the outer end of the guide arranged to be attached to the machine frame, a carriage on a guide, a bearing head carried by the carriage and adjustable thereon in a direction toward and from the commutator, a grinding disc and shaft therefor bearing in the bearing head, a driving pulley on the grinding disc shaft, a manually operative shaft for effecting the adjustment of the bearing head having its bearing in the guide support, a feed screw for the carriage bearing in the guide support and operatively engaging the carriage, a shaft hanger carried by the inner end of the guide, a drum extending parallel to the guide and bearing at the outer end in the guide support and at its inner end in the shaft hanger, means for rotating the drum, and a driving belt connecting the drum and grinding disc pulley.

10. For dynamo electric machines having an armature including a commutator and an adjacent brush supporting element, means for adjustably attaching the inner end of the slide to the brush supporting element, a support for the outer end of the guide arranged to be attached to the machine frame, a carriage on the guide, a bearing head carried by the carriage and ad-

justable thereon in a direction toward and from the commutator, a grinding disc and shaft therefor bearing in the bearing head, a driving pulley on the grinding disc shaft, a screw for effecting the adjustment of the bearing head, an operating shaft extending alongside the slide and having its bearing in the guide support, a screw operating gear splined on the shaft and arranged to travel with the carriage in continuous operative engagement with the screw, a feed screw for the carriage bearing in the guide support and operatively engaging the carriage, a shaft hanger carried by the inner end of the guide, a drum extending parallel to the guide and bearing at the outer end in the guide support and at its inner end in the shaft hanger, means for rotating the drum, and a driving belt connecting the drum and grinding disc pulley.

In witness whereof, I hereunto subscribe my signature.

MAX MAURAN.