F. S. WALTERS.

ROTARY CUTTING TOOL.

APPLICATION FILED JUNE 8, 1908.

1,031,828.

Patented July 9, 1912.

2 SHEETS—SHEET 1.

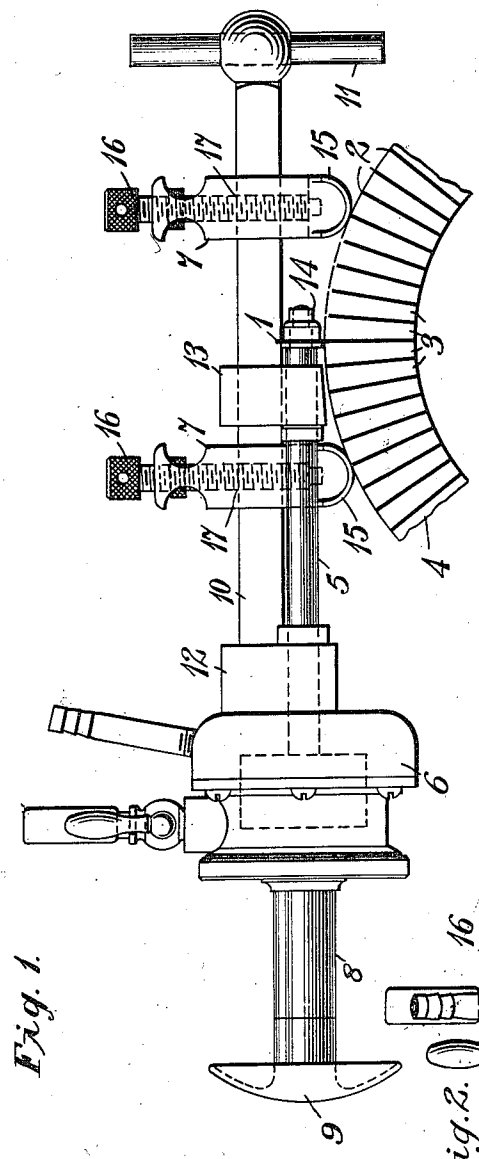

Fig. 1.

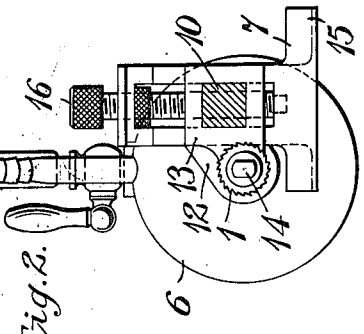

Fig. 2.

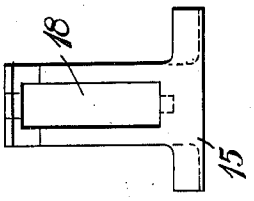

Fig. 5.

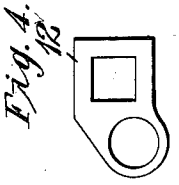

Fig. 4.

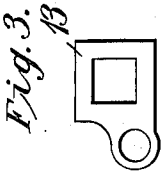

Fig. 3.

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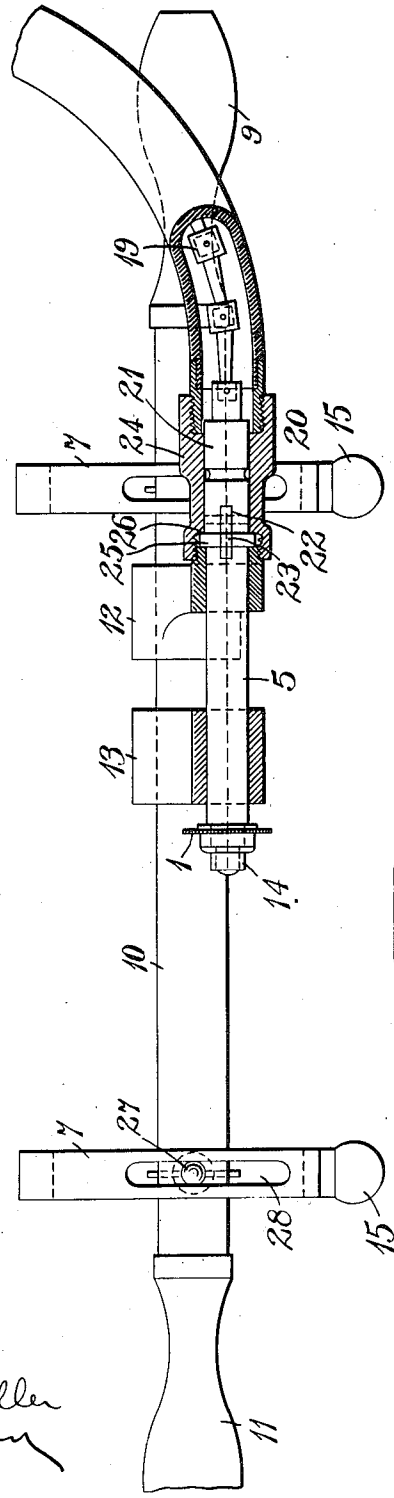

Fig. 6.

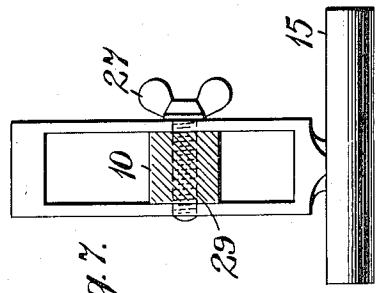

Fig. 7.

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UNITED STATES PATENT OFFICE.

FRANCIS S. WALTERS, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, OF EAST PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

ROTARY CUTTING-TOOL.

1,031,828. Specification of Letters Patent. Patented July 9, 1912.

Application filed June 8, 1908. Serial No. 437,323.

To all whom it may concern:

Be it known that I, FRANCIS S. WALTERS, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Rotary Cutting-Tools, of which the following is a specification.

My invention relates to power driven cutting tools, and it has special reference to devices of this character which are adapted for cutting the insulation between commutator bars.

The object of my invention is to provide a simple and efficient device for the purpose named, that may be readily adjusted for use with various sizes of commutator cylinders and which is light and portable.

The bars or segments of commutator cylinders for dynamo-electric machines are generally separated by sheets of mica or other hard, heat-resisting insulating material, in order that the cylinders may not be injured when subjected to high temperatures. The insulating sheets are sometimes flush with the outer surface of the commutator cylinder, but, under certain conditions of service, where the wear on the commutator is likely to be excessive, better results may be secured by cutting the insulation to form a series of shallow grooves in the cylinder between the bars.

According to one embodiment of my present invention, I provide a portable cutting tool comprising a circular saw, a driving motor therefor and suitable guides which may be adjusted to suit commutators of different diameters. In another form of a similar device the circular cutting saw is mounted on a shaft carried by a guide bracket and driven through a flexible shaft, by any suitable driving motor.

Figure 1 of the accompanying drawings is a side elevation of my device for cutting the insulation of commutators, a portion of a commutator cylinder being shown with the tool in position for operating upon it. Fig. 2 is an end elevation, with a portion of the guide structure broken away to disclose the cutting tool of the structure shown in Fig. 1, and Figs. 3, 4 and 5 are detail views of the same structure. Figs. 6 and 7 are partial sectional elevations, at right angles to each other, of a modified structure which also embodies my invention.

Referring to Figs. 1 to 5, inclusive, of the drawings, the device here illustrated comprises a circular saw 1 the thickness of which is made to correspond to that of the insulation 2 between the bars 3 of a commutator cylinder 4, a rotatable shaft 5 to which the saw is secured, a driving motor 6 for the shaft, and a pair of adjustable guides 7 which are adapted to rest on the outer surface of the cylinder. The driving motor 6 may be of any suitable type, being preferably either pneumatic or electric, in order that it may be readily accommodated to the use for which it is intended. An arm 8 projects from the casing of the motor in a direction opposite from that of the shaft and terminates in a handle-grip 9. A stationary rod 10 projects outwardly from the opposite side of the motor casing, parallel to the shaft 5, and terminates in a second handle-grip 11. The rotatable shaft is supported by bearing blocks 12 and 13 which are secured to the rod 10, and the saw is secured to the outer end of the shaft 5, by a clamping nut 14. The rod 10 serves also as a carrier for the adjustable guide members 7, which are similar to each other and each of which comprises a block having a cross-member 15 the outer surface of which is substantially semi-cylindrical, and an adjusting screw 16 which is screw-threaded through the block and through tapped holes 17 provided in the rod 10, the block being provided with a slot 18 in order that the rod 10 may extend through it. By adjusting the screws 16, the distance of separation between the axis of the saw and a plane tangent to the cylindrical surfaces of the guides 7 may be readily varied. It will be readily understood that the adjustment of these guides may be so effected as to adapt the tool to commutator cylinders of different diameters, and so, also, as to adjust the depth of the cut made by the saw.

Referring to Figs. 6 and 7, in which like parts are designated by the same reference characters as those employed in the other figures, the shaft 5 to which the saw 1 is secured may be driven by any suitable motor or driving shaft (not shown) located at a distance from the cutting device, a driving

connection being established between the two by means of a flexible shaft 19. The flexible shaft may be joined to the shaft 5 by any suitable means, such as a coupling 20 which comprises a relatively short shaft 21 having a lateral slot or keyway 22 at one end, a key 23 that is secured to one end of the shaft 5 and extends into the slot 22, and a sleeve or bushing 24 which surrounds the short shaft 21 and is screw-threaded on the adjacent end of the bearing 12. The end of the shaft 5 adjacent to the short shaft 21 is preferably provided with a flange 25 which takes up the end thrust of the shaft by engaging the end surface of the bearing 12 on one side and a shoulder 26 near one end of the sleeve 24 on the other. Each of the guide members 7 is adjustably mounted on the rod 10 by means of a set-screw 27 which extends through a longitudinal slot 28 in the guide member and is threaded into a tapped hole 29 in the rod. In this way, not only is an adjustment of the guide member permitted in a line perpendicular to the center of the rod, but also an angular or rotatable adjustment about the set-screw 27. The guide members may be adjustable along the rod or shaft instead of in lines which are perpendicular to the rod, without materially changing the results which may be effected.

The operation of the device is as follows: Assuming that the tool has been properly adjusted, the grips located at opposite ends of the tool are grasped by an attendant, who then moves the tool across the commutator cylinder, the saw-cut being guided by the engagement of the semi-cylindrical surfaces of the guide blocks with the commutator cylinder. Since various structural modifications may be effected within the scope of my invention, I desire that only such limitations shall be imposed as are indicated in the appended claims.

I claim as my invention:

1. A cutting device for commutator insulation comprising a circular saw, a rotatable shaft upon which said saw is mounted, a relatively stationary arm substantially parallel to the rotatable shaft, and guide members mounted upon said arm at the respective sides of said saw for engaging the commutator cylinder, and means for laterally adjusting said guide members with reference to said arm.

2. A cutting device for commutator insulation comprising a rotatable shaft, a circular saw removably secured thereto, a driving motor for the shaft, handle projections by which the motor may be supported, and guide members for engaging the commutator cylinder, said members being secured to one of the handle projections, transversely adjustable relative thereto and disposed at the respective sides of the saw.

In testimony whereof, I have hereunto subscribed my name this 1st day of June, 1908.

FRANCIS S. WALTERS.

Witnesses:
H. L. Jones,
Birney Hines.