(No Model.)

P. B. BOSWORTH.

COMMUTATOR TRUING DEVICE.

No. 586,514. Patented July 13, 1897.

Fig. 1.

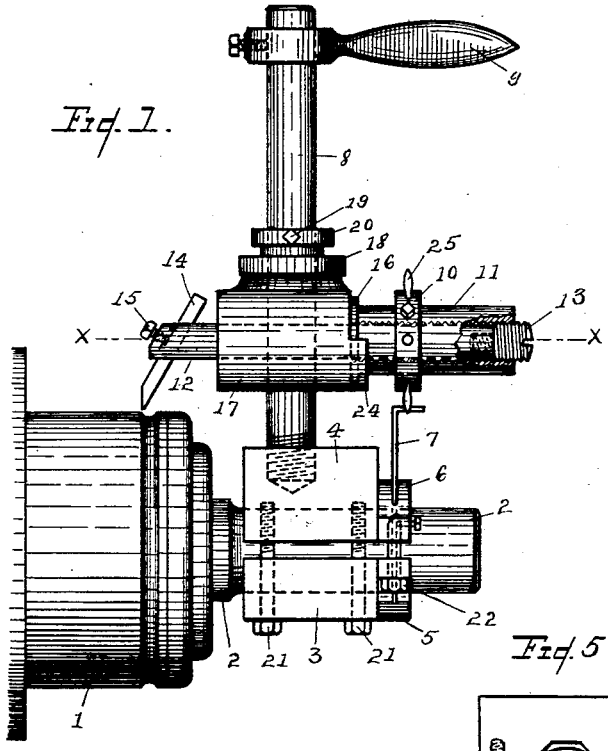


Fig. 2.

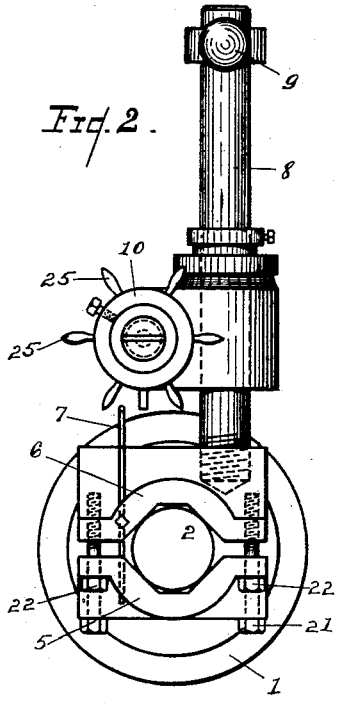


Fig. 5.

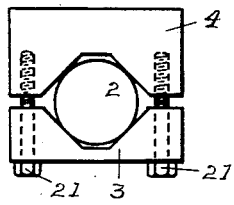


Fig. 3.

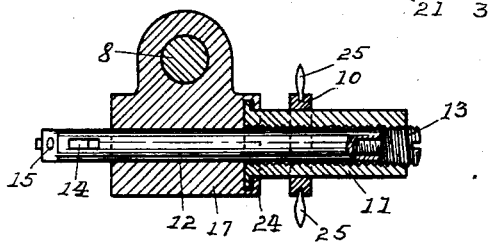
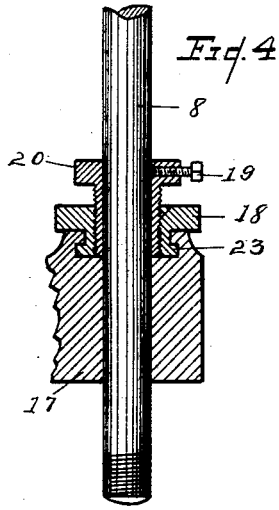


Fig. 4.



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PERCY B. BOSWORTH, OF FORT WAYNE, INDIANA.

COMMUTATOR-TRUING DEVICE.

SPECIFICATION forming part of Letters Patent No. 586,514, dated July 13, 1897.

Application filed December 17, 1896. Serial No. 615,990. (No model.)

To all whom it may concern:

Be it known that I, PERCY B. BOSWORTH, a citizen of the United States, residing at Fort Wayne, in the county of Allen, in the State of Indiana, have invented certain new and useful Improvements in Commutator-Truing Devices; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in means for truing or turning down commutators employed upon dynamos, motors, generators, &c., and is specially designed to be employed for such purpose without removing the commutator from its supporting-shaft.

My invention comprises a pair of adjustable blocks adapted to be rotatably mounted upon the armature-shaft in diametric relation, a two-part adjustable collar adapted to be removably fixed upon said shaft adjacent to the outer end of said blocks and carrying an upright feed-pin, a hand-crank rigidly fixed in one of said blocks for rotating the same about the armature-shaft, a removable driving-head adjustably mounted on said crank, carrying a reciprocating tool-holder, and means for imparting to the same an automatic horizontal feed.

The object of my invention is to provide a convenient, efficient, and economical means for truing or turning down commutators by hand-power without removal from the shaft in electrical power-stations and other situations where commutators are employed, thereby obviating the customary inconvenience, expense, and loss of time incident to such removal and transportation for repairs; so constructed that if the commutator be rotated while my device is secured in fixed relation thereto, as may be desired in some situations, the cutting-tool will maintain a perfect alinement with the bearing proper, and is adapted for any desired vertical adjustment and for a reciprocating horizontal feeding movement.

The novel feature of my invention consists in the construction and arrangement for removably mounting a hand-turning commutator-truing device upon the armature-shaft and in the means for imparting to the tool-holder a reciprocating horizontal feed.

In the accompanying drawings similar reference-numerals indicate corresponding parts throughout the several views, in which—

Figure 1 is a side elevation of my improvement in position on the armature-shaft, showing the relative arrangement of the operating parts. Fig. 2 is an end view of the same. Fig. 3 is a sectional plan of the driving-head, taken on the line $x\,x$ of Fig. 1. Fig. 4 is a vertical section of the driving-head, showing the screw-threaded adjusting-collars thereon. Fig. 5 is a detail of the adjustable blocks on which the hand-crank and driving-head are mounted, shown in position on the armature-shaft.

All parts of my improvement are preferably made of suitable metal.

The rectangular blocks 3 and 4 are removably and rotatably mounted upon the armature-shaft 2 in immediate proximity to the commutator 1, and are provided with a hexagonal shaft-opening adapted to fit various sizes of shaft, and are rigidly connected by proper holding-screws 21 or in other proper manner. The upper block 4 is preferably of somewhat greater thickness to support the hand-crank 8. The said blocks thus arranged are of sufficient length to insure perfect alinement and rigidity and are secured against longitudinal displacement by the two-part collar formed of the parts 5 and 6, identical in construction, also having a hexagonal shaft-opening. The said parts are adjustably connected and rigidly clamped upon the shaft 2 adjacent to the outer end of the said blocks by means of the holding-screws 22. In suitable coincident apertures in the said parts 5 and 6 is rigidly fixed the upright feed-pin 7.

In the block 4 is rigidly fixed by a screw-threaded connection the hand-crank 8, arranged in parallel relation to said feed-pin and at right angles to the plane of the commutator-shaft, and is provided upon its free end with any proper operating-handle 9, removably secured thereon. On this crank 8 is slidably mounted the driving-head 17, having a vertical aperture to loosely receive the said crank and a lateral perforation to loosely contain the tool-holder 12 in parallel relation with the shaft 2, on which the commutator is fixed.

The said driving-head 17 is provided upon the top thereof with a loose internally-screw-threaded collar 18, encircling the said crank 8, and is loosely secured in said head by the engagement of the annular flange 23 with a corresponding recess in said head, Fig. 4. The said driving-head is rigidly held in any desired position of vertical adjustment upon the crank 8 by means of the set-screw 19 in the collar 20, whose reduced externally-screw-threaded portion is adapted to form a screw-threaded connection with the said collar 18. By this construction it is obvious that a limited vertical adjustment of the said head can readily be made by rotating the collar 18.

The lower portion of the front face of the head 17 has a longitudinal extension or flange 24, provided upon its upper surface with a semicircular recess adapted to loosely receive the annular flange 16 on the internally-screw-threaded sleeve 11, whereby the said sleeve is rotatably mounted and secured in said head. The bore or central opening of the said sleeve 11 is preferably coincident with and of the same diameter as that of the said lateral aperture in the driving-head. In these coincident circular openings the cylindrical tool-holder 12 is loosely mounted, all tendency toward a rotary movement therein being obviated by a proper spline, feather, or key therein, engaging a corresponding slit or slot on the head 17, but not shown in the drawings. The working end of the said tool-holder has an inclined slot or opening, in which the cutting-tool 14, of any proper form or size, is loosely mounted and then rigidly secured by the set-screw 15 when so set as to properly engage the face of the commutator.

In a screw-threaded opening in the rear end of the tool-holder 12 is secured the reduced end of the screw 13, whose outer screw-threaded portion engages the internal screw-thread of the said sleeve 11, whereby when the containing-sleeve 11 is rotated in its bearings it will impart to the said tool-holder an automatic reciprocating horizontal feed. At a proper point on said rotatable sleeve 11 is rigidly fixed by a set-screw or other proper manner a feed-wheel 10, having a plurality of fixed radial arms 25, adapted to successively engage the free end of the said fixed feed-pin 7.

The operation of my improvement thus described is, briefly stated, as follows: When my invention is properly mounted on the armature-shaft in operative relation with the perimeter of the commutator 1, the operator first sets the driving-head upon the crank 8 in its approximate working position, and it is then rigidly fixed thereon by the set-screw 19 in the collar 20, and may be further vertically, adjusted by rotation of the screw-threaded collar 18, as described. The cutting-tool 14 may also be readily adjusted in its containing-slot to touch the lowest surface or point on the perimeter of the commutator. By removing the set-screw 19 the operator can readily and quickly run the tool across the perimeter of the commutator by hand to find the lowest point on its surface and then set the driving-head accordingly. The operator now seizes the operating-handle 9 of the crank 8 and rotates the entire device upon the supporting-shaft. As the tool-holder 12 is locked against rotation in the driving-head 17 and has a screw-threaded connection with the rotatable sleeve 11 by means of the screw 13, it is obvious that the engagement of the fixed feed-pin 7 with the radial arms of the fixed feed-wheel 10 will correspondingly rotate the said sleeve 11 and thereby produce an automatic reciprocating horizontal feeding movement of said cutting-tool holder either in or out, as desired.

My improvement can thus be readily adjusted and conveniently operated in all ordinary situations, the armature in many instances not having to be removed from the dynamo-frame, the housing, pedestals, &c., being movable to the extent of allowing my improvement to be adjusted to the said shaft. The armature can also be put in between lathe-centers and the turning still be accomplished from the bearing-surface, making it possible to accurately turn the same even when the centers are injured so that the shaft does not turn true. The armature can also be secured to a bench by straps or other means and the tool operated by hand-power exclusively with the same accurate results.

My invention may be adapted to many other conditions besides the ones described. For example, it can be used for turning or cutting off shafting either on the bench or in position in their hangers.

The speed of the horizontal feed of the cutting-tool can of course be regulated by varying the number of radial arms on the said feed-wheel.

Having thus described my invention and the manner of employing the same, what I desire to secure by Letters Patent is—

1. A commutator truing or turning device, consisting of a two-part base adapted to be rotatably mounted on the armature-shaft; means for securing the same against longitudinal displacement; a hand-crank fixed in said base at right angles to the plane of the said shaft and provided upon its free end with an operating-handle; a driving-head vertically adjustable on said crank, laterally apertured for the tool-holder, and provided with an internally-screw-threaded revoluble sleeve arranged on the same axial line with said lateral aperture; a cylindrical tool-holder mounted in said sleeve and said aperture, as shown, arranged in parallel relation with the said shaft, carrying a cutting-tool upon its working end and having in its rear end a rigid screw adapted for a horizontal feeding engagement with said sleeve, as described; a feed-wheel fixed on said sleeve and adapted for an actuating engagement with a feed-pin arranged in a fixed position relatively to said shaft, all substantially as described.

2. In a hand turning device for truing or turning down commutators, the combination of a hand-crank rotatably mounted upon the armature-shaft by means of a pair of adjustable and separable supporting-blocks; a two-part separable collar fixed on said shaft for the purpose specified; an actuating feed-pin fixed in said collars as shown; a laterally-apertured driving-head slidably mounted on said crank, having a pair of screw-threaded collars to afford a limited vertical adjustment as described, and having a forwardly-projecting rotatably-mounted and internally-screw-threaded sleeve whose longitudinal opening is coincident with said lateral aperture in the driving-head; a reciprocating tool-holder mounted in said driving-head and threaded sleeve as described, carrying in its working end a cutting-tool, and provided at its rear end with a rigid screw adapted for a horizontal feeding engagement with said sleeve; a rigid feed-wheel mounted on said sleeve and adapted for an actuating engagement with said feed-pin, substantially as described.

3. In a commutator truing or turning device, a driving-head provided with a revoluble feeding-sleeve for the reciprocating tool-holder; a tool-holder loosely mounted in said head, arranged in said sleeve by a screw-threaded connection, and adapted for a longitudinal feed therein; a rigid screw 13 mounted as shown, in the rear end of said sleeve, and having a horizontal feeding engagement therewith, a cutting-tool adjustably mounted in the working end of said tool-holder; a feed-wheel 10 fixed on said sleeve to rotate the same; means for rotatably mounting said driving-head on the armature-shaft with the reciprocating tool-holder in parallel relation therewith; and an actuating feed-pin fixed as shown in coöperative relation with said wheel for actuating the said feed-wheel, all substantially as described.

4. The combination in a commutator-truing device of a driving-head having a revoluble feeding-sleeve for the reciprocating tool-holder; a tool-holder loosely mounted in said head and arranged in said sleeve by a screw-threaded connection and adapted for a longitudinal feed therein; a rigid screw 13 mounted as shown in the rear end of said sleeve and having a horizontal feeding engagement therewith; a cutting-tool adjustably mounted in the working end of said tool-holder; a feed-wheel fixed as shown on said sleeve to rotate the same; means for rotatably mounting said driving-head on the armature-shaft with the reciprocating tool-holder in parallel relation therewith; and means for actuating the said feed-wheel, all substantially as described.

Signed by me at Fort Wayne, Allen county, State of Indiana, this 11th day of December, A. D. 1896.

PERCY B. BOSWORTH.

Witnesses:
DANIEL B. KEHLER,
SOPHIA L. SCHWARZE.