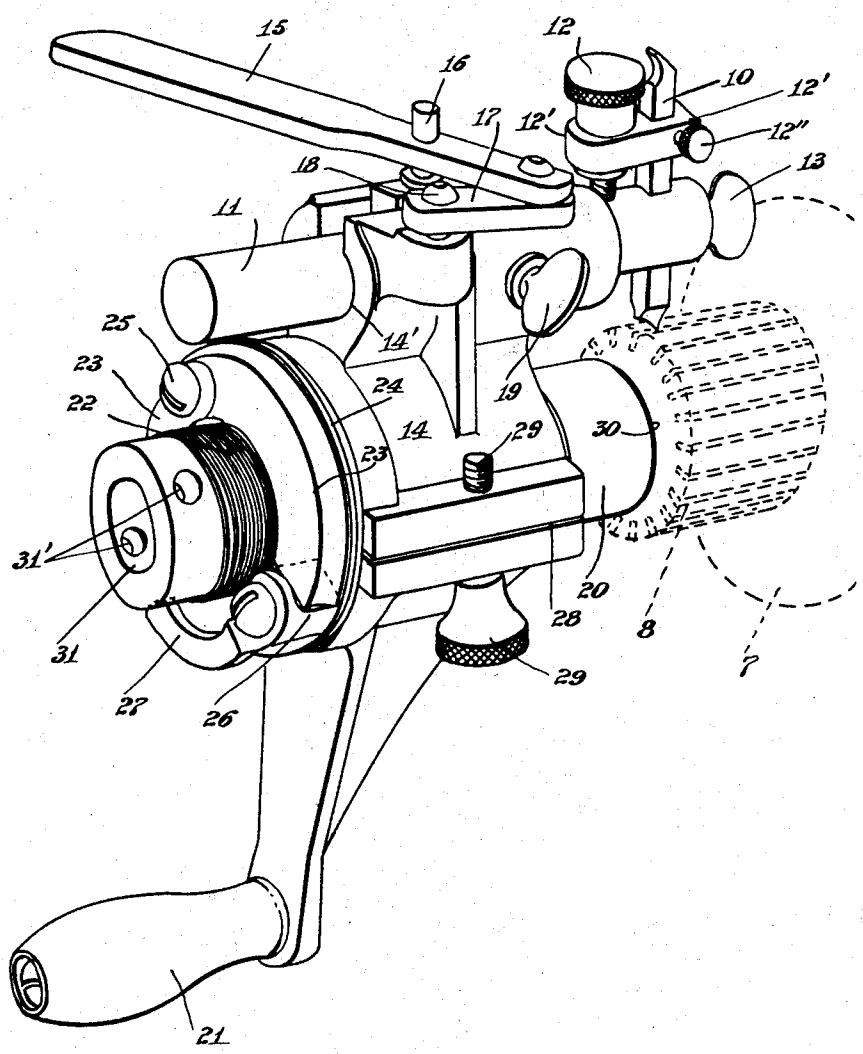
Jan. 24, 1939. J. L. MANSFIELD 2,145,091

TURNING AND SLOTTING DEVICE FOR COMMUTATORS, ETC

Filed Sept. 10, 1938 2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

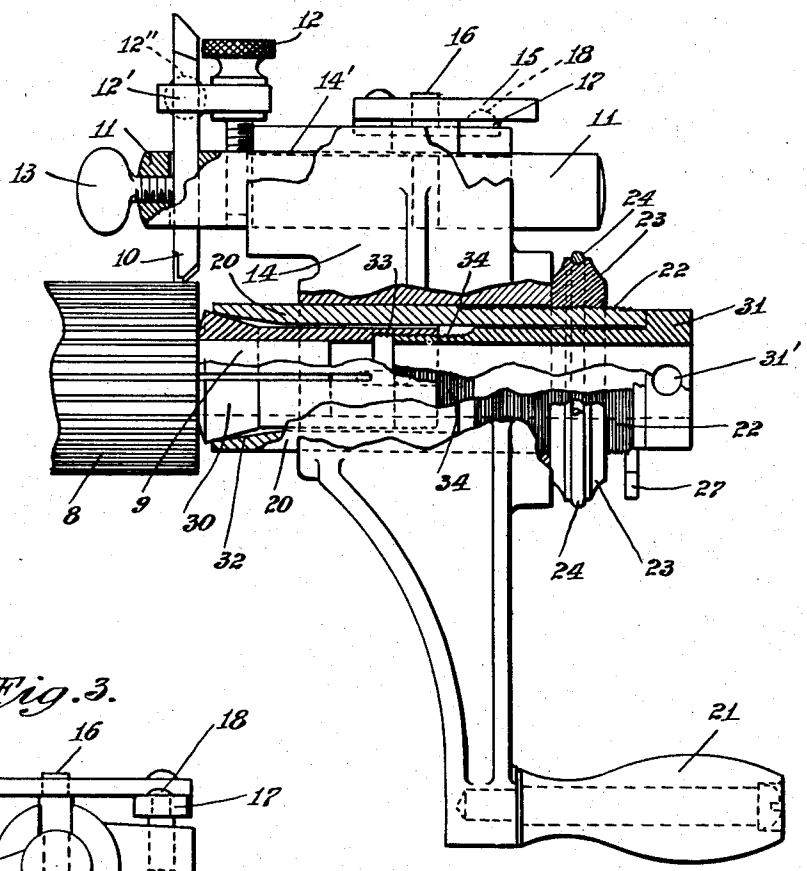


Fig. 3.

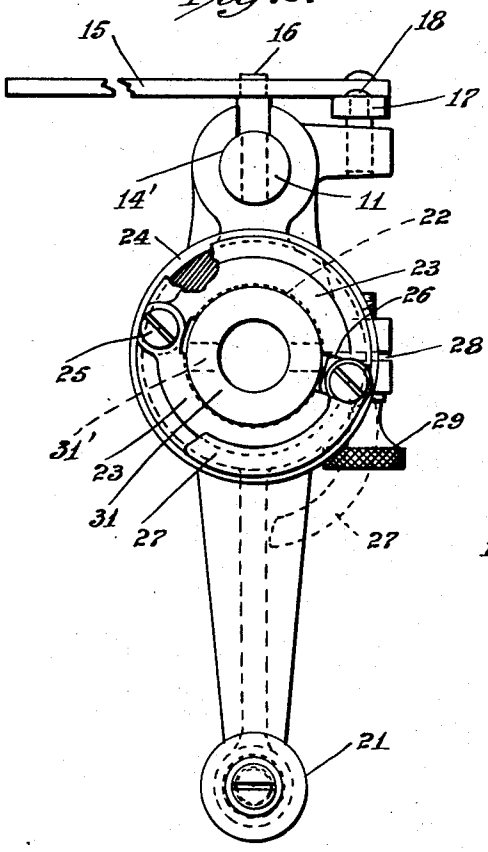
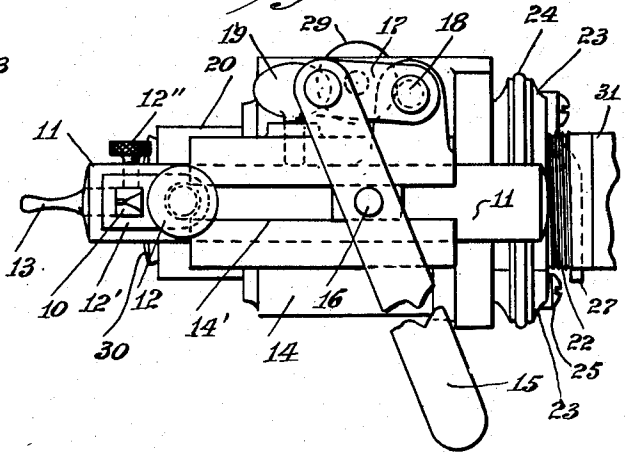


Fig. 4.



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TURNING AND SLOTTING DEVICE FOR COMMUTATORS, ETC.

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Application September 10, 1938, Serial No. 229,319

10 Claims. (Cl. 29—27)

My invention relates to portable devices for turning down commutators and cutting out insulation from between the commutator segments. In other words, it combines the functions of a lathe and a shaper.

One object is to provide a device which can be readily operated by hand.

Another object is to provide a simple but rugged and yet relatively inexpensive device.

Another object is to provide a device which can be readily actuated even by one who is inexperienced in machine tool work.

Another object is to provide a device which is readily adapted to different sizes of commutators and shafts.

In the drawings,

Fig. 1 is a perspective view of my improved lathe and shaper with a commutator in position.

Fig. 2 is a side view, parts being shown in section and parts being broken away for clearness.

Fig. 3 is an end view, parts being shown in section.

Fig. 4 is a top plan view.

An armature or rotor 7 has a commutator 8 with the usual segments separated by insulation. These segments should of course be kept smooth and true for the brushes and should project slightly beyond the insulation between the segments. The shaft 9 is of suitable diameter and in most modern cases has no center recess for a lathe center point.

The cutter 10 is preferably double ended so that the same cutter can be used for turning down the segments of the commutator and also for cutting out the insulation or "undercutting" as it is sometimes called.

This cutter is carried by a slide bar 11 and is adjustable by a screw 12 and connector 12'. The cutter 10 is adjustably and removably secured to the connector 12' by means of a set screw 12'' and may be set in position by a clamp screw 13.

The main body 14 of the device may be formed of a casting having a guide way 14' in which the carrier bar 11 slides parallel to the axis of the body.

A lever 15 is demountably secured on the stud 16 which projects upwardly from the bar 11. The lever is hinged to a link 17 which in turn is hinged to the pin 18 on the body so that cutter bar 11 may be moved back and forth by means of the lever 15. A clamp screw 19 is provided for holding the cutter bar in any desired position.

The body 14 is rotatable and slidable upon a tubular sleeve 20 and has a handle 21 preferably diametrically opposite the cutter bar by which the body can be rotated. One end of the sleeve 20 is screw threaded at 22 and the body is provided with a split nut to fit these threads. This nut may have two parts 23, 23 which are grooved and pressed toward the sleeve by a spring 24. These parts 23, 23 are preferably hinged to the body at 25. Between the opposite ends of the parts 23, 23 is a cam 26 having a handle or lever 27 so that the parts of the nut may be retracted from the screw threaded sleeve.

The body 14 is split at 28 and provided with a clamp screw 29 by means of which the body may be clamped to the sleeve to prevent relative rotation or reciprocation.

Inside of the sleeve 20 is mounted a chuck 30 and its clamping member 31. The inside of the jaws of the chuck is adapted to fit the end of the commutator shaft and the outside is conical to engage the tapered mouth 32 of the sleeve 20. The chuck member 30 and the clamping or adjusting member 31 are provided with screw threaded extensions 33 and 34 by which they can be connected so that when the adjuster is rotated it will draw the chuck into the sleeve and thus force the chuck jaws to grip the shaft 9. The adjuster may have tool holes 31'.

To use the device the parts are assembled in the approximate relation shown in the drawings but preferably with the nut sections 23, 23 engaging near the outer end of the screw threads 22 and with the clamp screw 29 just loose enough to permit the body 14 to turn on the sleeve 20. A chuck 30 of a proper size to fit the end of the shaft 9 is then inserted in the sleeve and the adjuster 31 tightened so as to cause the chuck to tightly embrace the shaft 9, the rotor and commutator being suitably held. The cutter carrier bar 11 is then moved longitudinally so as to bring the cutter 10 close to the end of the commutator. The cutter is then adjusted radially so as to be in a position to make the desired cut. The cutter is then clamped by the screw 13.

The carrier bar is clamped by the screw 19 thus rigidly fixing the cutter relative to the body 14. The body is then rotated by means of the handle 21 so that the screw threaded connection between the nut segments 23, 23 and the screw thread 22 will automatically feed the cutter so as to trim down the commutator.

When this operation is completed the nut segments 23, 23 are retracted by means of the lever 27 and cam 26 so that the entire body 14 and the

cutter bar can be retracted. A suitable cutter 10 is then adjusted into position to remove insulation from between two commutator segments. The body 14 is clamped by the screw 29 with the cutter in its proper position for the desired cut. The lever 15 is connected to the stud 16 on the carrier bar or slide 11 and to the link 17 and the clamp screw 19 is loosened so as to permit the cutter carrier bar to be moved back and forth by the lever 15. When one cut is completed, the clamp screw 29 is loosened and the body 14 rotated to bring the cutter into position for the next cut. Of course the lever 15 may be removed when turning down the commutator segments.

When the work is finished the adjuster 31 is retracted partially by rotation and then driven inwardly so as to disengage the chuck 30 from the mouth of the sleeve and release the jaws from the shaft 9.

It should be understood that cutters of suitable form may be provided and that a number of chucks may be provided to accommodate different sizes of shafts.

I claim:

1. A combination tool comprising a sleeve having an external screw thread on one end and an interior contracting shoulder inside of the opposite end, shaft clamping jaws coacting with said contracting shoulder inside of said sleeve, a body rotatable and longitudinally movable on said sleeve, a clamp for preventing rotation of the body about the sleeve, an expandible and contractable member carried by said body and having an interior screw thread for engaging the external screw thread on said sleeve, a cutter carrier slidable longitudinally of said body, a handle connected to said carrier for moving the same longitudinally of said body, a cutter adjustably carried by said carrier and means for rotating the body on the sleeve.

2. A combination tool comprising a sleeve having an external screw thread on one end and an interior shoulder inside of the opposite end, a shaft clamping chuck coacting with said shoulder inside of said sleeve, an actuating member connected to said clamping chuck inside of said sleeve and having a head exposed at the opposite end of said sleeve, a body rotatable and longitudinally movable on said sleeve, an expandible and contractable member carried by said body and having interior screw threads for engaging the external screw threads on said sleeve, an actuating member for retracting the member having the interior screw threads, a cutter carrier slidable longitudinally of said body, a handle connected to said carrier for moving the same longitudinally of said body, a cutter adjustably carried by said carrier and means for clamping said carrier in said body.

3. A combination tool for operating on commutators and the like comprising a sleeve having an external screw thread on one end and an interior shoulder inside of the opposite end, an elongated clamping chuck positioned in the shouldered end of said sleeve and being adapted to coact with said shoulder for clamping one end of the shaft of a supported commutator, said chuck being provided with internal screw threads, a tubular member freely mounted inside said sleeve and being provided with screw threads at its inner end adapted to engage the threads on the chuck, an actuating head on the tubular member exteriorly of the sleeve, a split nut member on the body adapted to engage the threads on the sleeve, a cam member for moving said nut out of engagement with the sleeve, a cutter carrier slidably mounted on the body, a cutter adjustably carried by said carrier, a handle hingedly and removably mounted on the body for actuating said carrier and an integral handle formed on the body for rotating the body around the sleeve.

4. A combination tool for operating on commutators and the like comprising a sleeve having an external screw thread on one end and an interior shoulder inside of the opposite end, an elongated clamping chuck positioned in the shouldered end of said sleeve and being adapted to coact with said shoulder for clamping one end of the shaft of a supported commutator, said chuck being provided with internal screw threads, a tubular member freely mounted inside said sleeve and being provided with screw threads at its inner end adapted to engage the threads on the chuck, an actuating head on the tubular member exteriorly of the sleeve, a split nut member on the body adapted to engage the threads on the sleeve, a cam member for moving said nut out of engagement with the sleeve, a cutter carrier slidably mounted on the body, a handle hingedly and removably mounted on the body for actuating said carrier, a cutter adjustably carried by said carrier, and an integral handle formed on the body for rotating the body around the sleeve, the overall length of said chuck and tubular member being greater than the length of the sleeve whereby movement of translation of the tubular member will eject the chuck from the sleeve.

5. A combination tool comprising a sleeve having an external screw thread on one end and an interior shoulder inside of the opposite end, a shaft clamping chuck coacting with said shoulder inside of said sleeve, an actuating member connected to said clamping chuck inside of said sleeve and having a head exposed at the opposite end of said sleeve, a body rotatable and longitudinally movable on said sleeve, a cutter carrier slidable longitudinally of said body, a handle connected to said carrier for moving the same longitudinally of said body, a cutter adjustably carried by said carrier, means for clamping said carrier in said body and means for locking the body and sleeve together, said means including a split nut member fastened on the body and being adapted to engage the threads of said sleeve, the split ends of said nut being spaced apart, a spring member surrounding said nut for urging same into engagement with the sleeve and a cam member in the space between the split ends of the nut for disengaging the threads of the nut from the sleeve.

6. A tool for operating on commutators and the like, comprising a body portion having an upper tubular bearing portion and a lower tubular bearing portion, an elongated sleeve freely mounted in the lower bearing portion and being provided with external screw threads at one end, and an inner shoulder at its opposite end, an elongated chuck member positioned in the shouldered end of the sleeve and being provided with internal screw threads at its inner end, a tubular member positioned in the threaded end of the sleeve and having a portion projecting exteriorly of said end of the sleeve and being provided with external screw threads at its inner end for engagement with the screw threads of the chuck, a split nut member fixed on the lower bearing portion for normally preventing relative move-

ment between the body and sleeve, a manually operated cam member fixed to the lower bearing portion for disengaging the nut from the sleeve to permit relative movement between the sleeve and body, a bar slidably mounted in the upper bearing portion, a cutter adjustably carried by said bar, means for clamping the bar to the upper bearing portion and a handle on the body portion for rotating the body portion around the sleeve.

7. A combination tool comprising a sleeve having external screw threads on one end and an interior contracting shoulder inside of the opposite end, a shaft clamping member coacting with the inside of said sleeve, an adjusting member having a head exposed at the threaded end of said sleeve and connected to said member, a body rotatable and longitudinally movable on said sleeve, and expandible and contractable member carried by said body and having interior screw threads for engaging the exterior screw threads on said sleeve, a cutter carrier slidable longitudinally of said body, a handle hinged to the body and to said carrier for moving the same longitudinally of said body and a cutter carried by said carrier.

8. A combination tool comprising a sleeve having external screw threads on one end, shaft clamping jaws coacting with the other end of said sleeve, a body rotatable and longitudinally movable on said sleeve, a clamp for preventing rotation of the sleeve on the body, an expandible and contractable member carried by said body and having interior screw threads for engaging the exterior screw threads on said sleeve, a cutter carrier slidable longitudinally of said body, a handle connected by a link to said body and connected to said carrier for moving the same longitudinally of said body, a cutter carried by said carrier and means for clamping said cutter carrier to said body.

9. A combination tool comprising a sleeve having external screw threads on one end and an interior shoulder inside of the opposite end, a shaft clamping member coacting with said shoulder inside of said sleeve, an adjusting member having a screw threaded connection with said clamping member, a body rotatable and longitudinally movable on said sleeve, an expandible and contractable member including a number of hinged parts carried by said body and having interior screw threads for engaging the exterior screw threads on said sleeve, a cutter carrier slidable longitudinally of said body when the expandible and contractable member is retracted from the sleeve, means for clamping said carrier to said body, a cutter adjustably carried by said carrier and a handle for rotating the body on the sleeve.

10. A combination tool comprising a sleeve having external screw threads on one end and an interior shoulder inside of the opposite end, a shaft clamping member coacting with said shoulder inside of said sleeve, an adjusting member having a screw threaded connection with said clamping member, a body rotatable and longitudinally movable on said sleeve, an expandible and contractable member including a number of hinged parts carried by said body and having interior screw threads for engaging the exterior screw threads on said sleeve to prevent relative movement between the sleeve and body, a cutter carrier on the body, a cutter adjustably carried by said cutter carrier and a handle for rotating the body on the sleeve.

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