April 28, 1942. E. L. JOHNSON 2,281,307

TOOL

Filed June 3, 1940 2 Sheets-Sheet 1

Fig. 1.

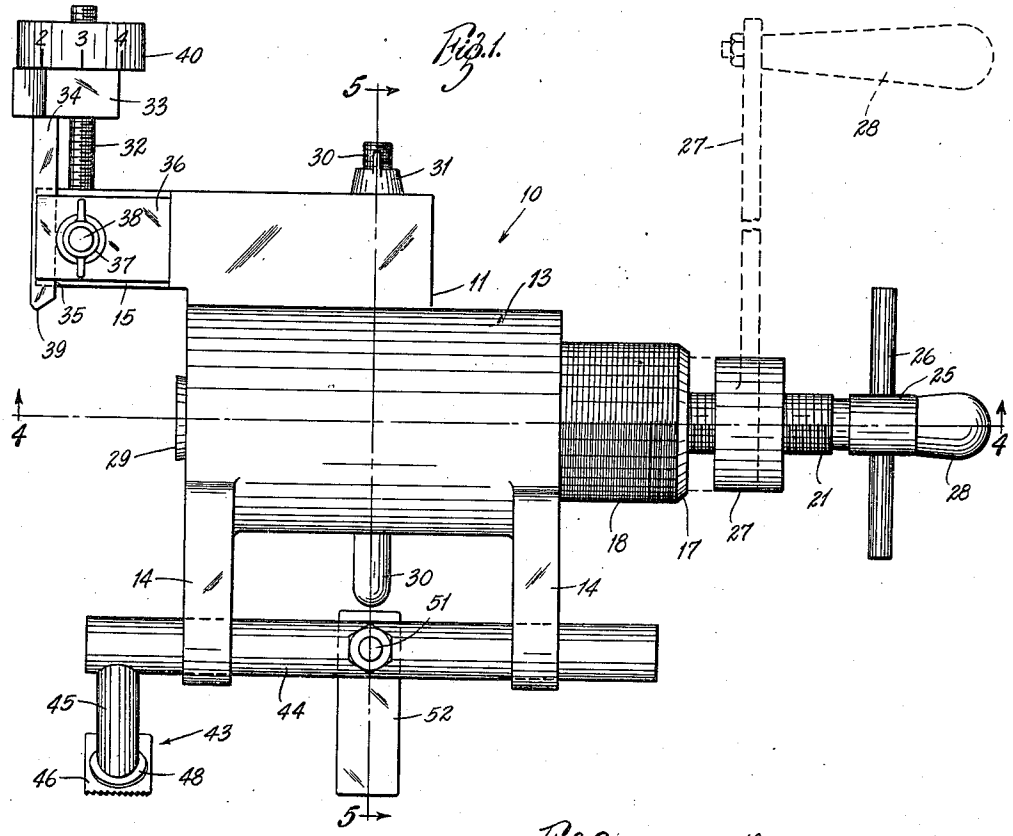
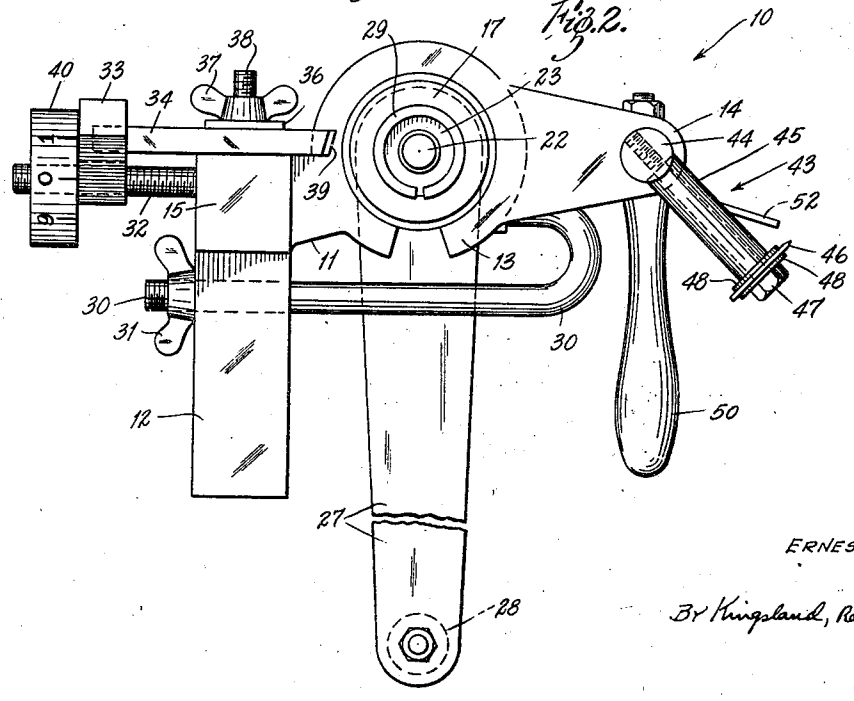



Fig. 2.




INVENTOR:
ERNEST L. JOHNSON,

By Kingsland, Rogers & Lyall

ATTORNEYS.

April 28, 1942. E. L. JOHNSON 2,281,307

TOOL

Filed June 3, 1940 2 Sheets-Sheet 2

Fig. 3.

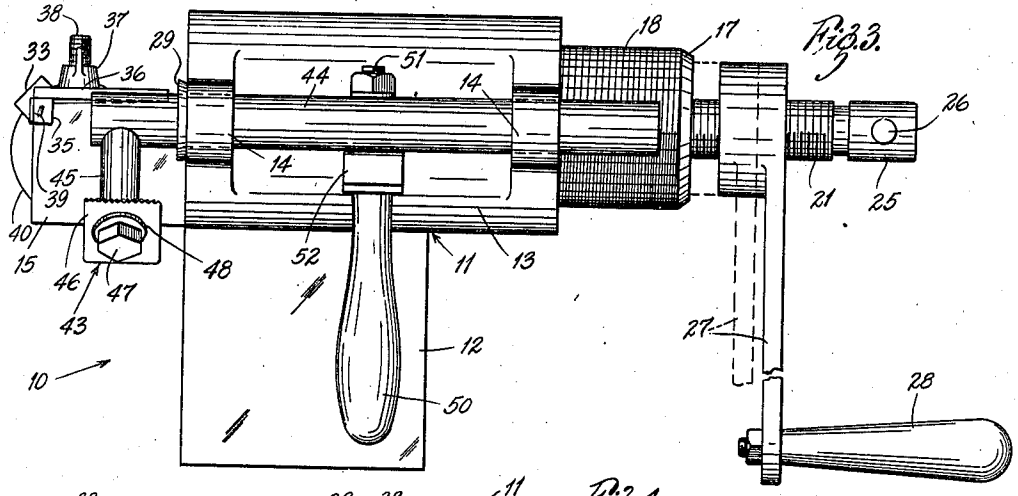



Fig. 4.

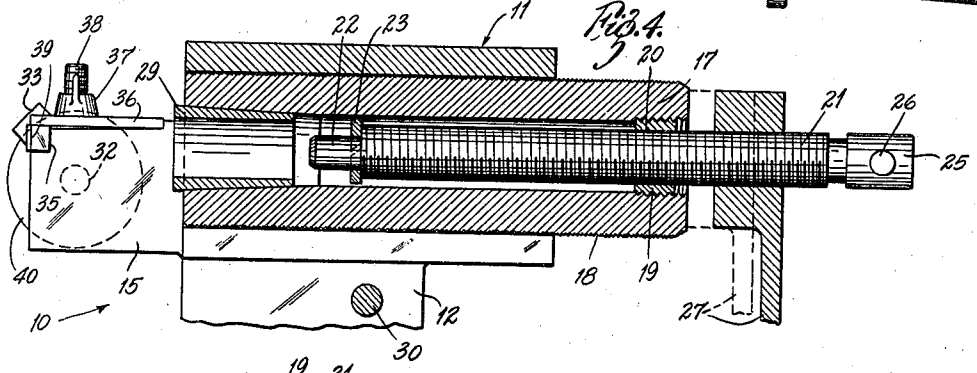



Fig. 5.

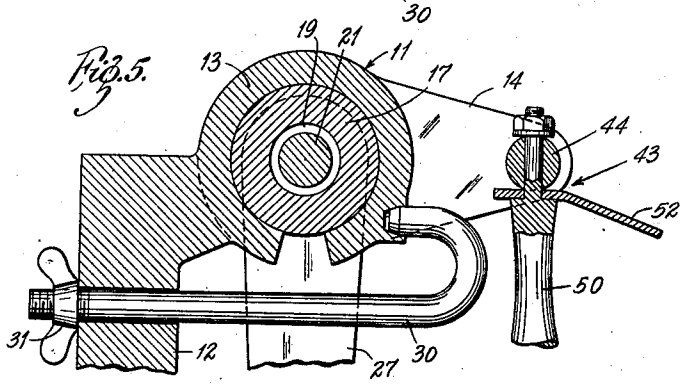



Fig. 7.

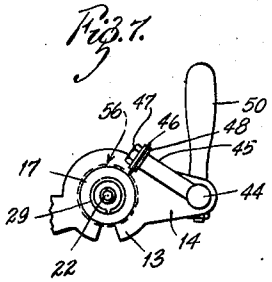
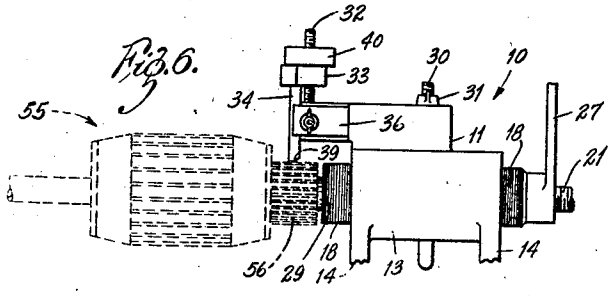



Fig. 6.




INVENTOR:
ERNEST L. JOHNSON,

BY Kingsland, Rogers & Ezell

ATTORNEYS.

Patented Apr. 28, 1942 2,281,307

# UNITED STATES PATENT OFFICE

2,281,307

## TOOL

Ernest L. Johnson, Ferguson, Mo.

Application June 3, 1940, Serial No. 338,491

4 Claims. (Cl. 82—4)

The present invention relates generally to turning tools, and more particularly to a portable lathe for dressing down armature commutators and for other such work requiring exactness.

There are, of course, on the market both power-driven and manually operable lathes of various kinds. However, heretofore there has never been developed a small compact portable lathe which is particularly adapted to true the armature commutators of car generators, starters, and the like, and to perform similar tasks.

Therefore, an object of the present invention is to provide a small portable lathe which is particularly adapted to true the armature commutators of automobile generators, starters, or the like, and to perform similar services.

Another object is to provide a portable lathe adapted to turn down the armature commutator of a generator, or the like, in which the armature is simultaneously rotated and moved longitudinally through the medium of microscopic threads.

Another object is to provide a portable lathe adapted to true the armature commutator of a generator, or the like, which is constructed to include a device for cleaning mica and for easily removing the armature after the truing operation.

Another object is to provide a portable lathe which is small and compact, which is sturdy in construction, and which is adapted to fulfill all of the objects and advantages sought therefor.

Other objects and advantages will be apparent from the following description, taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a top plan view of a preferred embodiment of the present lathe;

Fig. 2 is an end elevation view of the lathe shown in Fig. 1;

Fig. 3 is a front elevation view of the lathe shown in Fig. 1;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is a section on the line 5—5 of Fig. 1;

Fig. 6 is a top plan view on a reduced scale of the lathe shown in Fig. 1 with an armature dotted in operative relation thereto for turning down, parts of the lathe being broken away to conserve space; and,

Fig. 7 is a fragmentary end view on a reduced scale of the lathe shown in Fig. 1 with an armature dotted in in operative relation thereto for cleaning the mica.

Referring to the drawings more particularly by reference numerals, 10 indicates generally a lathe constructed in accordance with the teachings of the present invention. The lathe 10 includes a casting 11 which comprises a base block 12 adapted to be received by a vise, or the like; a split cylindrical body 13 connected to the upper part of the base block 12; spaced ears 14 extending from the cylindrical body 13; and an extension 15 disposed at one side of the base block 12.

A spindle or cylinder 17 having microscopic threads 18 throughout its length is disposed within the split cylindrical body 13. A plug 19 having a threaded aperture 20 closes one end of the cylinder 17 and threadedly receives a threaded shaft 21. The shaft 21 terminates at the interiorly disposed end in a reduced portion 22 (Fig. 4). An annular member 23 is disposed about the reduced portion 22 and against the shoulder formed in the offset of the reduced portion 22 from the main body of the shaft 21. The exteriorly disposed end of the shaft 21 is unthreaded in a portion 25, through which extends a member 26 that serves as a handle for movement of the shaft 21 into and out of the cylinder 17. An arm 27 threadedly engages the shaft 21 between the unthreaded portion 25 and the cylinder 17. The arm 27 terminates in a handle 28. A removable split tapered chuck or sleeve 29 is shown disposed in that end of the cylinder 17 remote from the plug 19. A J-bolt 30 extends through the base block 12. The shorter leg of the J-bolt 30 engages an opening in the cylindrical body 13. A wing nut 31 is threaded on the extremity of the longer leg of the bolt 30 for purposes of applying closing pressure to the cylindrical body 13.

A threaded post 32 (Fig. 2) is secured into and extends rearwardly from the extension 15. A member 33 is disposed about the post 32 by an aperture adjacent one end and has secured to its other end a steel blade 34 which is disposed in substantially parallel relation with the post 32. The steel blade 34 rests in part in a right angle groove 35 (Fig. 3) formed in one corner of the extension 15. A plate 36 secured to the top of the extension 15 by a wing nut 37 threaded on a threaded post 38 maintains the steel blade 34 in predetermined position. The steel blade 34 terminates in a sharp cutting point 39. A dial member 40 is threaded on the post 32 and is employed to determine the position of the steel blade 34. The plate 36, in extending over a portion of the steel blade 34, serves also as a guard for the point 39.

A mica remover 43 includes a shaft 44 supported in the ears 14 for longitudinal and rotary

movement. A post 45 is connected to that end of the shaft 44 which extends exteriorly of the ears 14 in the vicinity of the extension 15. A serrated blade 46 is secured to the post 45 transversely thereof by a threaded bolt 47, which extends through the serrated blade 46 and into a threaded aperture in the post 45. Washers 48 are disposed on each side of the blade 46. A handle 50 is secured by a threaded bolt 51 to the shaft 44 between the ears 14. A stop and guide member 52 is likewise secured to the shaft 44 by the bolt 51. The member 52 is located relative to the blade 46 to stop the pivotal movement of the latter short of the threads 18 of the cylinder 17 to prevent accidental injury of the threads 18.

*Operation*

The casting 11 serves as the foundation with which the remaining elements are operatively associated. After the shaft 21, with its threadedly engaged arm 27 and handle member 26, has been threaded into the cylinder 17 by means of the plug 19, the cylinder 17 is disposed within the split cylindrical body 13, the interior of which is cast smooth. By means of the wing nut 31 and the J-bolt 30, the split cylindrical body 13 is closed into firm relationship with the cylinder 17, which has the continuous microscopic thread 18 extending along the full length thereof. The arm 27 with its handle 28 is then employed to rotate the cylinder 17 to cut a corresponding microscopic thread into the erstwhile smooth inner surface of the cylindrical body 13. Meanwhile, the mica remover 43 and the steel blade 34 and its associated elements are connected to the casting 11 in a manner obvious from the foregoing description. The lathe 10 is then ready for use.

The split tapered sleeve 29 is disposed about the shaft of an armature 55 adjacent the commutator 56 thereof. The sleeve-encased shaft end is then forced into that end of the cylinder 17 remote from the plug 19 until there is established a firm relationship. This disposes the commutator 56 in a position to be turned down by the blade 34. The blade 34 is adjusted to cutting position by means of the dial 40.

After the blade 34 has been properly adjusted, the cylinder 17 is rotated by means of the arm 27 and handle 28 until the complete surface of the commutator 56 has been cut by the blade 34. In the rotation of the cylinder 17, the full surface of the commutator 56 is exposed to the relatively sharp point 35 of the blade 34, due to the microscopic threads on the cylinder 17.

After the surface of the commutator 56 has been cut by the blade 34, the mica remover 43 is brought into action. The serrated blade 46 is disposed in one of the crevices separating the copper sections of the commutator 56. The edge is then moved rapidly longitudinally of the commutator 56 by means of the handle 50 to free undesirable material lodged therewithin. This action is repeated for each of the openings. The stop member 52 prevents the blade 46 from being inadvertently drawn across the fine threads 18 of the cylinder 17.

After the foregoing, the shaft 21 is actuated by means of the handle member 26 to remove the armature from the lathe 10, the shaft 21 thus serving as a plunger. The annular member 23 serves to eject the sleeve 29 where this action is necessary.

The arm 27 is not fixed to the cylinder 17, although this construction may be employed if desired. It is not necessary to rotate the cylinder 17 for movement to the right (Fig. 4), inasmuch as the wing nut 31 (Fig. 2) may be loosened and the cylinder 17 subsequently bodily moved to the right.

The several elements of the present construction are, of course, to be constructed of suitable material and of proper configuration. It is contemplated that the configurations of the several elements may be changed within the scope of the present invention.

It is manifest that there has been described and shown a construction which fulfills all of the objects and advantages of the present invention. It is to be understood that the foregoing description and accompanying drawings have been given by way of illustration and example, and not for purposes of limitation, the invention being limited only by the claims which follow.

What is claimed is:

1. A lathe comprising a casting including a base and a split cylindrical body portion, a threaded cylinder disposed within the cylindrical portion, means releasably closing the split cylindrical body into engagement with the cylinder, means for rotating the cylinder to effect longitudinal movement thereof through the cylindrical body, means for maintaining a commutator in engagement with the cylinder for rotation therewith, and adjustable stationary means disposed to turn down the commutator during the rotation of the cylinder.

2. A lathe comprising a support, a split sleeve connected to the support, means for supporting a commutator disposed in said sleeve for rotary movement, means for rotating said last means, means for turning down the commutator as the first means is rotated, and means for ejecting the commutator from engagement with the first means.

3. A tool for turning down the commutator of an armature comprising a base including a split sleeve, a microscopically threaded cylinder releasably secured within the sleeve for rotative and longitudinal movement therein, means for rotating the cylinder, means for securing a commutator to one end of the cylinder for movement therewith, and an adjustable stationary cutter secured to the base in a position to be adjusted into cutting engagement with the commutator, whereby rotation of the cylinder effects a turning down of the commutator.

4. A tool for turning down the commutator of an armature comprising a base including a split sleeve, a microscopically threaded cylinder releasably secured within the sleeve for rotative and longitudinal movement therein, means for rotating the cylinder, means for securing a commutator to one end of the cylinder for movement therewith, an adjustable stationary cutter secured to the base in a position to be adjusted into cutting engagement with the commutator, and means for forcibly and positively removing the commutator from engagement with the cylinder.

ERNEST L. JOHNSON.