Dec. 11, 1945. D. O. TRUBA ET AL 2,390,627

TAPER CUTTING ATTACHMENT FOR LATHES

Filed Sept. 5, 1944 3 Sheets-Sheet 1

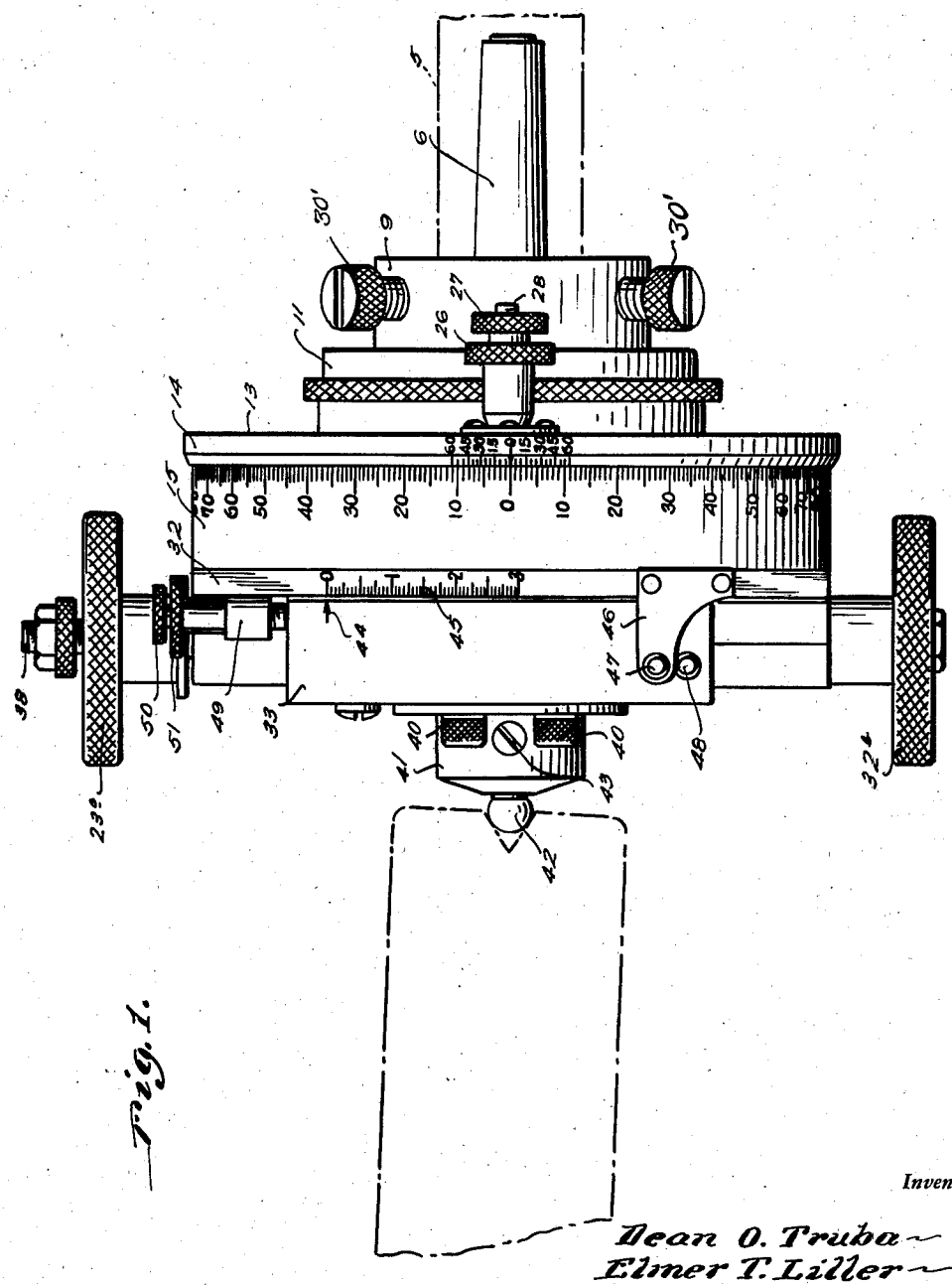


Fig. 1.

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Fig. 5.

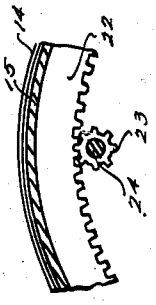


Fig. 6.

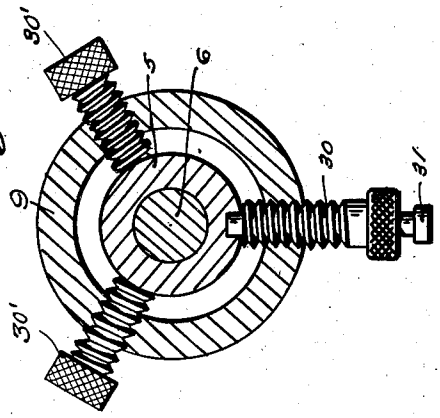
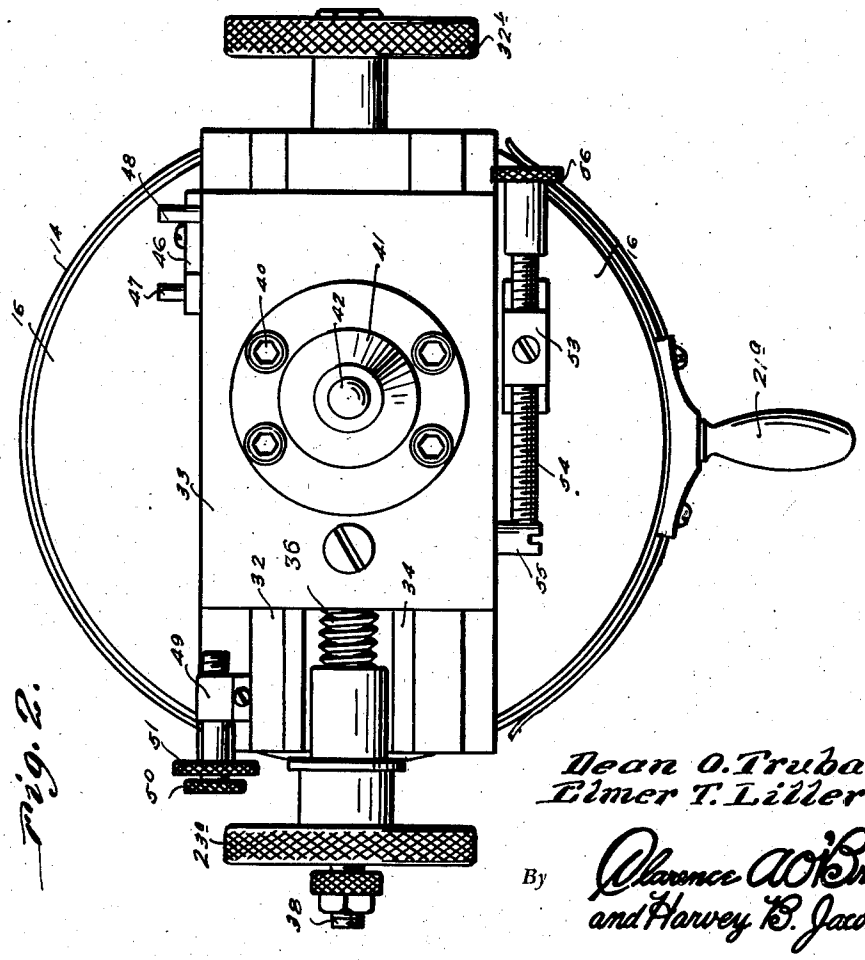


Fig. 2.



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Fig. 4.

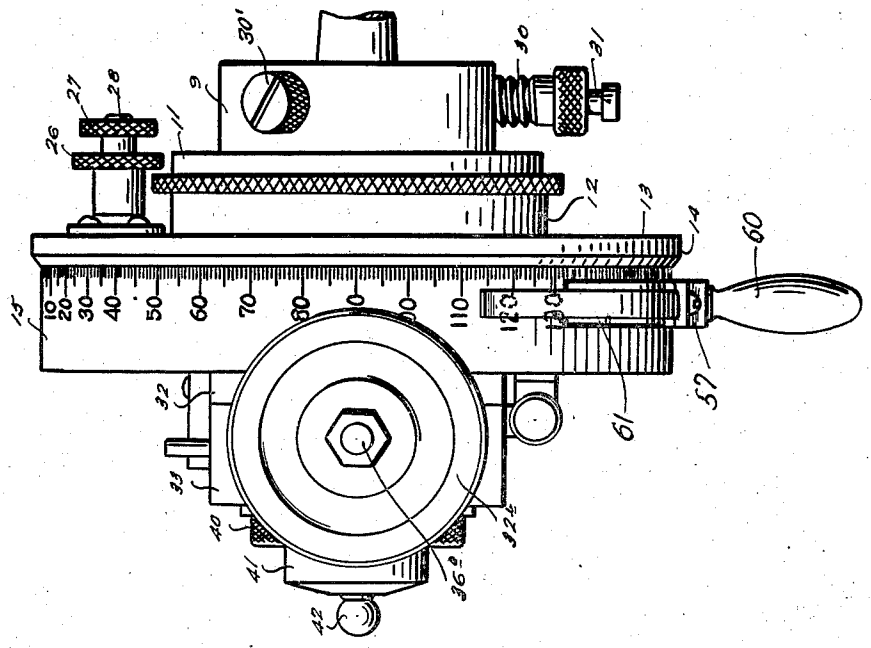
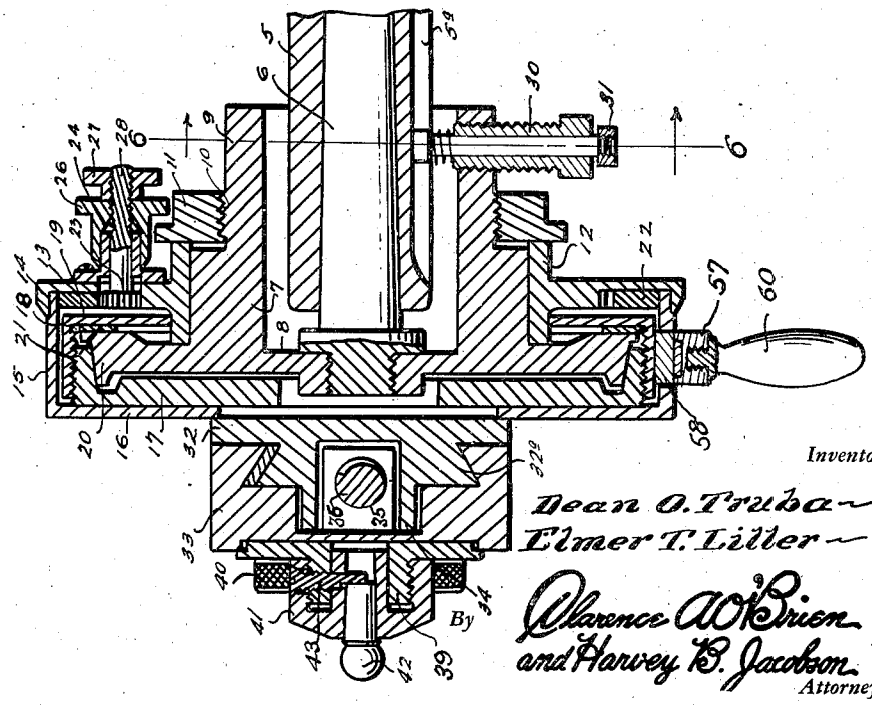


Fig. 5.



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TAPER CUTTING ATTACHMENT FOR LATHES

Dean O. Truba, South Gate, and Elmer T. Liller, Los Angeles, Calif.

Application September 5, 1944, Serial No. 552,754

3 Claims. (Cl. 82—15)

This invention appertains to new and useful improvements in taper cutting attachment for lathes and more particularly to an improvement in our co-pending application Serial No. 470,618, filed December 30, 1942, and now Patent No. 2,372,916, granted April 3, 1945.

An important object of the invention is to provide an improved tailstock whereby the tailstock can be set and the work held at an off-center position to effect the cutting of tapers in work.

Another important object of the invention is to provide an adjustable tailstock for performing taper work which can be readily adjusted and wherein micromic facilities are provided for minute adjustments.

Other objects and advantages of the invention will become apparent to the reader of the following description.

In the drawings:

Figure 1 represents a top plan view of the assembly.

Figure 2 is a face elevational view of the improved tailstock.

Figure 3 is a vertical sectional view through the improved tailstock.

Figure 4 is a fragmentary side elevational view.

Figure 5 is a fragmentary sectional detail view of protractor ring with its ring gear and the driving pinion for said ring gear.

Figure 6 is a section on line 6—6 of Figure 3.

Referring to the drawings wherein like numerals designate like parts, it can be seen that numeral 5 denotes the usual tailstock spindle of a lathe which is adapted to receive the usual detachable tailstock taper 6. Obviously, various sizes of tapers 6 may be employed, depending upon the size of the lathe upon which the improved tailstock is to be employed.

Numeral 7 denotes a cylindrical body having a central web 8 into which the taper 6 is screwed. This body 7 is stepped downwardly to provide a horizontal skirt 9 having threads 10 on which a vernier locking ring 11 is feedable, this ring being feedable against a vernier ring 12 which has an outstanding wall 13 provided with an outwardly disposed and beveled rim 14, slightly overlapping the cylindrical portion 15 of a protractor ring 16. The protractor ring 16 is secured to an annulus 17 located therein and which is threaded at its periphery for threaded engagement with a taper locking ring 18, this ring having an internal flange 19 between which and a beveled annular head 20 on the body 7 a shim 21 is located.

Inside of the protractor ring 16 is a ring gear 22 with which a pinion 23 on a shaft 24 meshes. The shaft is slidable in a cap structure which also has a recess into which the gear 23 can recede and thus be located without contact with the ring gear 22. The gear can be thus retained in out of meshed position through the use of a threaded nut 26 and a jamb nut 27 located on the threaded portion 28 of the shaft 24. Obviously, by rotating the shaft 24, with the gear 23 in mesh with the ring gear 22, adjustment of the protractor ring 16 is accomplished. This operation takes place only after the vernier locking ring 11 has been loosened.

It can here be seen that a tailstock locking screw 30 is carried by the skirt 9 of the hollow body 7. The screw 30 is disposed through the skirt, and this contains a pin 31 which engages into the keyway 5a of the spindle 5. (See Figure 3.) Other set screws 30' coact with screw 30 to brace and secure the body 7 in concentric relation to spindle 5 and to secure the taper 6 in said spindle.

The means for effecting an off-center disposition of work includes a transversely disposed block 32 carried by ring 16 and having a dovetail formation 32a thereon over which a dovetail channeled slide 33 is disposed.

The slide 33 has a groove therein for receiving a box extension 34 on the block 32. The slide 33 carries a nut 35 which is formed with a threaded opening for receiving an elongated feed screw 36.

The feed screw 36 has a reduced threaded portion 36a on which is a hand wheel 32b, while on the other end of the shaft 36 is a reduced threaded extension 38 on which is a knurled hand wheel 23a. With respect to the shaft 36, the hand wheels 32b and 23a, these parts operate the same as the corresponding mechanism in our pending application Serial No. 470,618.

A stud 39 is secured to the face side of the slide 33 by Allen screws or the like 40, the projecting portion of this stud being threaded to engage internal threads in a cap 41 which has a tapered socket for receiving the tapered shank of a ball center 42. This ball center can be dislodged whenever desired by rotating a cam screw 43.

On the slide block 33 is an indicating mark 44 which is complemental to graduations 45 on the top of the block 32. This is a taper roughing gauge. It will be seen that when the slide 33 is moved transversely it makes possible a scale reading of the offset amount when precision settings are not required.

On the block 32 is secured a substantially

right-angularly-shaped plate 46 having an upstanding pin 47 at a portion located over the slide 33. An upstanding pin 48 in the path of the plate 46 is provided on the slide 33. This assembly of parts constitutes a mechanism by which the center 42 may be set off-center to any desired micromic setting. The plate 46 which serves as a bracket for the micromic pin is stationary. The micromatic pin 48 moves along with the slide 43. It can be seen that by reading the distance between the pins 47, 48 with micrometers the amount of offset can be determined accurately.

A back center stop is composed of a bracket 49 on block 32 through which a screw 50 is feedable and this screw is provided with a skirted jamb nut 51. This device prevents the slide 33 from moving back of a definite set center point.

A fixed nut 53 on the protractor ring 16 has a threaded shaft 54 disposed therethrough and in the path of a protuberance 55 depending from the slide block 33. The screw 54, which is rotated by a knurled knob 56, in conjunction with the stop 55 make up a device for duplicate taper work and may be set at any predetermined amount of offset from a center.

A block 57 is attached to an external rib 58 carried by the taper locking ring 18 and movable in a circumferential slot 59 provided in the cylindrical portion 15 of protractor ring 16. A handle 60 is attached to block 57, and the intermediate portion of a leaf spring 61 is secured between the block 57 and rib 58. The ends of spring 61 bear on the periphery of the portion 15 of ring 16 beyond the ends of slot 59. When handle 60 is used to turn ring 16 and release the frictional engagement between the parts 19, 20 and 21, the parts 16 and 17 and the elements carried by part 16 can be freely turned relative to the parts 5, 6, 7, 8 and 20.

By loosening screws 40, stud 39 may be shifted to adjust the ball center 42 to a centralized position, the stud 39 having apertures slightly larger than the stems of screws 40 which pass therethrough.

Screw 54 is adjustable so that it may be set for duplicate stops.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having described the invention, what is claimed as new is:

1. In a tailstock, a work center, micromatic adjusting means for off-center adjusting said center, a protractor carriage for said center and adjusting means, and means for rotating said carriage, said carriage consisting of an internal ring gear, said carriage rotating means including a hand rotated shaft and a pinion on said shaft meshing with the ring gear.

2. In a tailstock, a work center, micromatic adjusting means for off-center adjusting said center, a protractor carriage for said center and adjusting means, and means for rotating said carriage, said carriage consisting of an internal ring gear, said carriage rotating means including a hand rotated shaft and a pinion on said shaft meshing with the ring gear, said ring gear being shiftable to a position out of mesh with the ring gear.

3. In a tailstock, a work center, micromatic adjusting means for off-center adjusting said center, a protractor carriage for said center and adjusting means, and means for rotating said carriage, said carriage consisting of an internal ring gear, said carriage rotating means including a hand rotated shaft and a pinion on said shaft meshing with the ring gear, said ring gear being shiftable to a position out of mesh with the ring gear, said protractor being operative independently of the ring gear and shaft carried pinion.

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