



# UNITED STATES PATENT OFFICE.

WILLIAM BARKER, OF NEWPORT, KENTUCKY.

## MACHINE FOR GRINDING LATHE-CENTERS.

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*To all whom it may concern:*

Be it known that I, WILLIAM BARKER, a citizen of the United States, and a resident of Newport, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Machines for Grinding Lathe-Centers, of which the following is a specification.

The object of my invention is a machine for grinding the hardened centers of lathes, which can be readily attached for use without removing the face-plate or making any attachments to it, which can be readily set to grind the centers at any angle from forty-five degrees to sixty degrees, and when set grinds all centers to exactly the same angle, thus insuring perfect fits in mandrels and work without the use of gages. These objects are attained by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the device. Fig. 2 is a top view. Fig. 3 is a detail view in side elevation of the sleeve, which carries the grinding-wheel spindle and furnishes its bearing. Fig. 4 is an elevation of the turret by which the spindle-sleeve, the spindle, and its attachments are moved longitudinally in the stock or frame which carries the moving parts. Fig. 5 is a sectional view taken in line  $xx$  of Fig. 1, the supporting-arm for connecting the device to the foot-stock being removed.

Referring to the parts, each one of which, wherever it appears in any of the views, is indicated by the same reference-letter, the stock or frame which supports the moving parts consists of a perforated cylindrical portion A, an upright standard A', a boss A<sup>2</sup>, and lug A<sup>3</sup>. These are preferably made of cast-iron and molded in a single piece. There is also formed on one side of the cylinder a lug  $a$ . The cylindrical part A is bored out true to receive the tubular sleeve B, which is the journal-bearing of the shaft C, which carries the emery-wheel D. The cylinder A, after it is bored out and the sleeve fitted to slide in the bore, is longitudinally slotted through its entire length upon one side, the slot passing centrally through the lug  $a$ , in order that the cylinder may be contracted by tightening the screw-bolt  $a'$ , which passes freely through the

upper half of the lug and is tapped into the lower half, and thus compensates for wear of the joint between the cylinder and sleeve.

The shaft C extends beyond the tube B at each end. Near one end it has secured upon it a disk E and upon the other end is fitted by spline-connection, as shown in Fig. 5, a long pinion F. After the shaft is slipped through the sleeve B until the disk E bears against one end of the tube the pinion F is pushed against the opposite end of the tube, and the shaft is held in place and prevented from moving longitudinally independent of the tube by the nut  $c$  and washer  $c'$ .

The end of the shaft C, which extends beyond the disk E to receive the emery-wheel D, is screw-threaded to receive a nut  $c^2$ , which clamps the emery-wheel against the disk E. The shaft C is driven by a cog-rimmed hand-wheel G, which is journaled on a stud-pin  $g$ , secured in the upper end of the standard A'. The teeth  $g'$  of the hand-wheel mesh with the teeth of the pinion F.

The sleeve B has rack-teeth  $b$  formed upon one side, and the boss A<sup>2</sup> is bored down vertically to near its bottom. The bore in the boss extends into the bore in the cylinder A, so that when the cylinder B is in place its rack-teeth extend into the bore in the boss A<sup>2</sup> to mesh with the teeth of the turret-pinion H, which fits into the bore in the boss A<sup>2</sup>. The turret-shaft has formed upon it two collars  $h'$   $h^2$ , the one  $h'$  to rest on the rim of boss A<sup>2</sup> and protect the pinion from emery-dust and the other to receive a pin  $h^3$ , by which the shaft and its pinion are turned to move the tube B, shaft C, and its connections back and forth in the cylinder A. The pinion H may be secured to its shaft  $h$  in any approved manner or formed integral with it. The lower part of the shaft passes through a central perforation in the bottom of the boss A<sup>2</sup>, and is held in place by a pin  $h^4$ . Upon the lug A<sup>3</sup> is jointed a tubular arm I. One end of the plug J is made to fit this tubular arm, within which it is held by a set-screw  $i$ . The opposite end of the plug is turned off to fit into the foot-stock of any lathe. It will thus be seen that it is only necessary to remove the center of the dead-spindle and place the plug J in the foot-stock, when the ma-

chine is ready for work. The angle to which the centers are to be ground is regulated by loosening the set-screw I' and turning the machine around until the face of the emery-wheel D is at the desired angle to the axis of the live-spindle or center to be ground and then tightening the screw I'. When once the shaft C is set to the proper angle, it need not be again changed, and will be in exactly the right position to grind all centers to the same angle so soon as placed in the foot-stock. Thus all gaging is unnecessary.

To operate the device, the emery-wheel is brought into position by moving up the foot-stock. The emery-wheel is revolved by turning the wheel G by means of the handle  $g^2$  with one hand, while with the other hand the turret-shaft  $h$  is rocked to feed it back and forth in contact with the cone end of the center to be ground while it is revolving. It is obvious that the plug J may be shaped to fit the tool-post of a lathe; but so arranged it could not be so quickly adjusted to its work, it would require gaging each time it was set to work, and the work would not be so reliable and much more difficult to perform.

I claim—

1. The combination, in a center-grinding attachment for lathes, of the stock, the cylinder B, having rack-teeth  $b$ , fitted to slide longitudinally in said stock, the spindle carrying the grinding-wheel journaled in said sleeve and movable longitudinally with it, the

gear for revolving the spindle, the cogged turret for reciprocating the sleeve and spindle, and the swiveled arm and plug for connecting the machine to the lathe.

2. In a center-grinding attachment for lathes, the combination of the stock carrying the moving parts, a spindle carrying the grinding-wheel longitudinally movable in said stock, a hand-wheel and gearing to revolve the spindle, the arm swiveled to said stock, and a plug to connect said arm and the foot-stock of the lathe, substantially as shown and described.

3. The combination, substantially as specified, of the stock comprising the cylinder A, standard A', boss A<sup>2</sup>, and lug A<sup>3</sup>, the sleeve B, having rack-teeth upon one side fitted to slide in said cylinder, and the teeth projecting into the bore in boss A<sup>2</sup>, the cogged turret journaled in said boss and having its teeth meshing with the rack-teeth on the sleeve, the spindle C, journaled in said sleeve and movable longitudinally with it, the pinion F, disk E, and grinding-wheel D, secured upon said shaft, the cogged hand-wheel journaled on a stud in said standard and meshing with the pinion to revolve the shaft, the hollow arm I, swiveled upon lug A<sup>3</sup>, and the plug J for connecting the device to the foot-stock of a lathe.

WILLIAM BARKER.

Witnesses:

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FRANK S. DAVIS.