Feb. 23, 1937. H. A. KREMER 2,071,882

GRINDING MACHINE

Filed July 16, 1934

Fig. 1.

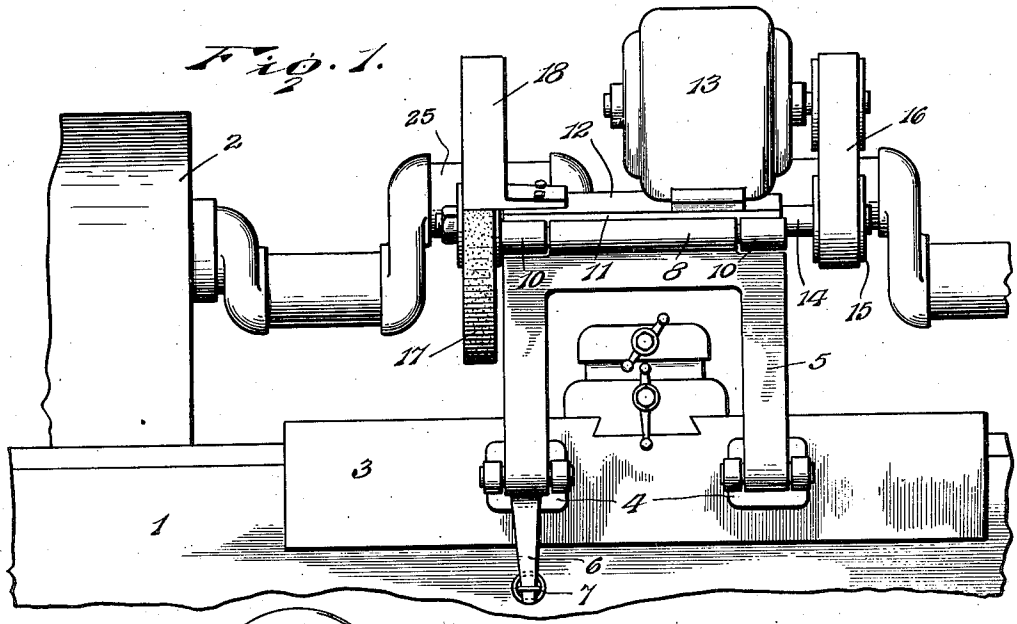


Fig. 2.

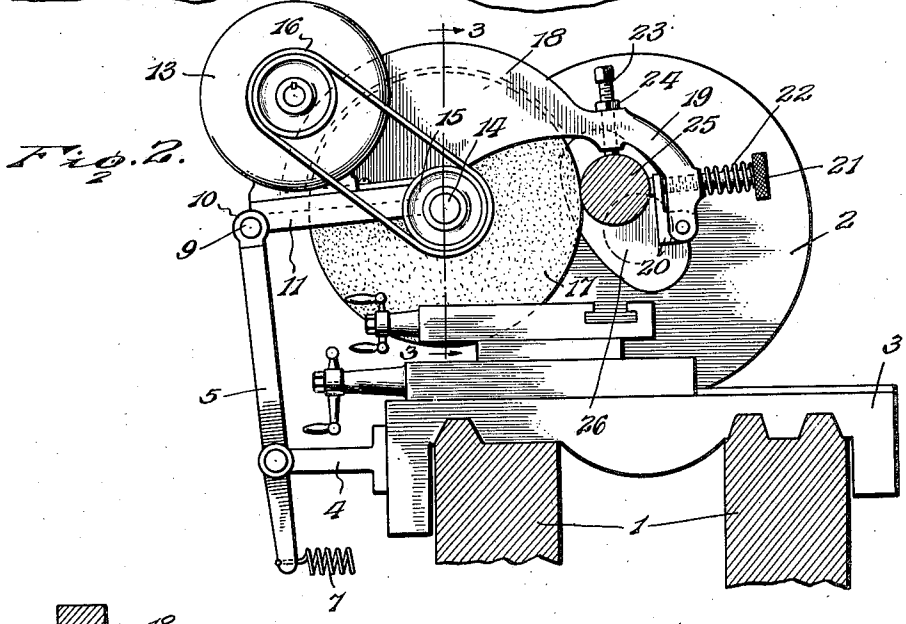
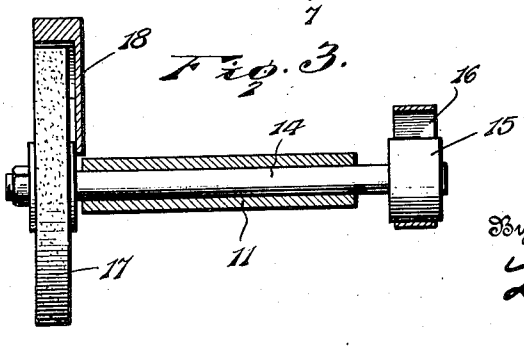


Fig. 3.



Inventor

H. A. Kremer.

By Lacey & Lacey

Attorneys

Patented Feb. 23, 1937 2,071,882

UNITED STATES PATENT OFFICE

2,071,882

GRINDING MACHINE

Henry A. Kremer, Gulfport, Miss.

Application July 16, 1934, Serial No. 735,477

4 Claims. (Cl. 51—259)

This invention relates to grinding machines and has special reference to a machine for grinding the crank pins or bearings of crank shafts, the object of the invention being to provide a mechanism which may be mounted upon or built into an ordinary lathe and will be especially adapted for grinding the crank pins of automobile crank shafts. It is also an object of the invention to provide a mechanism for the stated purpose which will operate efficiently and automatically to re-grind the crank pins into a true circular cross section and to provide for an accurate adjustment of the mechanism to the work. The stated objects and other objects which will appear incidentally in the course of the following description are attained in such a mechanism as is illustrated in the accompanying drawing, and the invention resides in certain novel features which will be particularly defined in the appended claims.

In the drawing:

Figure 1 is a front elevation of an apparatus embodying the invention.

Figure 2 is a side elevation, with parts in section.

Figure 3 is a detail section on the line 3—3 of Figure 2.

The apparatus of my invention is adapted to be mounted upon an ordinary lathe, a portion of the frame of which is shown at 1, the reference numeral 2 indicating the lathe center or chuck. In carrying out the present invention, the usual slide 3 is employed and upon the front side of said slide brackets 4 are secured to project therefrom. An inverted U-shaped lever or frame 5 is pivoted at the ends of its legs upon the brackets 4, as shown clearly in Figures 1 and 2, and one of the legs is extended, as shown at 6, below the brackets and is engaged by one end of a retractile spring 7, the opposite end of which is attached to the lathe frame whereby the spring tends constantly to draw the extension toward the lathe and thereby rock the lever or frame 5 at its upper end or shoulder forwardly from the lathe. The arch or shoulder of the frame 5 is provided with a sleeve 8 and a hinge pin 9 is fitted through said sleeve, the ends of the pin being engaged in eyes 10 formed upon a frame 11 which projects inwardly above the slide 3 and the frame of the lathe and constitutes a platform 12 upon which is mounted a small motor, indicated conventionally at 13. At the rear end of the platform or frame 11 is carried a shaft 14 mounted in bearings provided therefor on the frame and equipped at one end with a pulley 15 driven by a belt 16 from the motor 13, as will be understood. The shaft 14 extends entirely across the platform or frame 11 and at the end remote from the pulley 15 is secured centrally in a grinding disk 17. A hood 18 is secured upon the platform and extends over the upper portion of the grinding disk 17, as clearly shown, so that injury to the operator will be avoided.

Extending from the rear edge of the hood 18 is an arm 19 which projects beyond and downwardly in spaced relation to the grinding disk, as shown clearly in Figure 2, and at the extremity of this arm 19 is pivotally mounted a shoe 20. An adjusting screw 21 is threaded through the end of the arm 19 and has its extremity swiveled in the shoe 20 whereby, as the screw is turned to move inwardly or outwardly through the arm, the shoe will be set closer to or farther therefrom. An expansion spring 22 is trained around the stem of the screw between the arm and the head thereof so that it serves to increase the frictional engagement between the screw and the arm and thereby aids in holding the screw in a set position. A second holding screw 23 is mounted in the upper portion of the arm, preferably at a right angle to the screw 21, and is provided with a lock nut 24 whereby it will be held in any position in which it may be set. The screws 21 and 23 are arranged to bear upon the crank pin which is being ground, as indicated at 25, and the free extremities of the screws may be provided with fiber caps or equivalent devices, if desired, in order to avoid scoring of the crank pin.

In the drawing, I have shown a crank shaft which is to be ground and is disposed in proper position in the lathe and supported by the lathe centers. The axis of the crank shaft will be disposed in axial alinement with the lathe centers, indicated at 26, and the crank pins will, consequently, be disposed off center. Then the feed screw 21 is initially adjusted so that the crank pin will be admitted between the grinding disk and the arm 19, and said screw is then adjusted so as to hold the high part of the crank pin against the grinding disk after which the crank shaft is rotated in the lathe and the grinding disk is rotated in contact with the crank pin directly from the motor 13. The speed of the lathe will be less than the speed of the grinding disk and the grinding disk will follow the crank pin as it moves through a circular path under the power of the lathe. The lever 5 will rock upon its pivotal supports 4 to accommodate the relative horizontal movement of the grinding disk

and the crank pin while the platform or frame 11 will turn upon the pivot 9 to accommodate the relatively vertical movement of the grinding disk and the crank pin so that the disk will be held to the work throughout the operation and will act upon the surface of the crank pin to remove the relatively high parts of the same and restore the circular cross section thereof.

It is well known that, after an automobile has been operated for some time, the crank pins and bearings are worn at several points so that they lose their true circular cross section and it becomes necessary to re-grind them so as to restore the true circular cross section. Heretofore, machines provided for this work have been more or less complicated and expensive and I have provided a machine which is composed of few parts, of simple construction and arrangement which operates efficiently and will quickly restore the true circular contour of crank pins and bearings. The grinding member is carried in a floating frame which must follow the movement of the crank pin as the crank shaft is rotated by the lathe and will, therefore, act upon the crank pin so as to quickly re-grind it. The amount of metal ground from the crank pin will be determined by the setting of the adjusting screw 21, the distance to which the screw is adjusted toward the grinding disk determining the depth to which the grinding of the crank pin will be carried. After one crank pin has been ground, the screw 21 is released from the crank pin and the hood and the arm extending therefrom with the platform 11 may then be swung upwardly to clear the crank pin and the crank arms whereupon the slide 3 may be shifted along the frame of the lathe to bring the grinding disk into proper engagement with another crank pin.

While this invention can be adapted to an ordinary lathe, it is evident that a complete machine can be built, performing the functions of both the lathe and the grinding machine herein described.

Having thus described the invention, I claim:

1. An attachment for lathes comprising a lever, means for pivotally supporting said lever upon a lathe at a point between the ends of the lever, yieldable means attached to the lower end of the lever for drawing said lower end toward the lathe, a platform hingedly mounted on the upper end of the lever, a grinding disk carried by said platform, means on the platform to rotate the disk, a hood secured on the platform and extending over the grinding disk, an arm extending from the hood, and means in the arm for engaging a crank pin and holding the grinding disk to the crank pin whereby the grinding disk will follow the movements of the crank pin.

2. An attachment for lathes comprising a swinging frame, means for mounting the swinging frame upon a lathe, a yieldable connection between the lower end of the frame and the lathe, a platform hingedly mounted upon the upper end of the frame, a grinding disk carried by said platform, means for rotating the grinding disk, a hood secured upon the platform and extending over the grinding disk, an arm extending from the hood and adapted to pass over a crank pin, and setting screws mounted in the arm and adapted to engage a crank pin on intersecting lines and hold the grinding disk to the crank pin and cause the grinding disk to follow the rotation of the crank pin.

3. An attachment for lathes comprising a vertically disposed frame, means for pivotally supporting said frame upon the lathe, a yieldable connection between the lower end of the frame and the lathe, a platform hingedly mounted upon the upper end of the frame, a grinding disk carried by the platform, a hood on the platform extending over the grinding disk, an arm projecting from the hood and adapted to pass over and behind a crank pin to be ground, setting screws mounted in the arm on intersecting lines to engage the crank pin and maintain contact between the same and the grinding disk, a shoe pivoted to the extremity of the arm and engaged with the end of the adjacent screw, and an expansion spring disposed about said screw between the arm and the head of the screw.

4. In a grinding machine, a grinding disk, supporting means therefor, a hood on said supporting means and adapted to extend over the disk, said hood being provided with an arm extending therefrom radially and being adapted to extend about a shaft associated with the disk, and means extending through the arm and adapted for engagement of work to be ground at spaced points about said work.

HENRY A. KREMER.