June 29, 1937. W. F. GROENE 2,085,357

STEADY REST FOR CRANKSHAFT LATHES

Filed Oct. 28, 1936 2 Sheets-Sheet 1

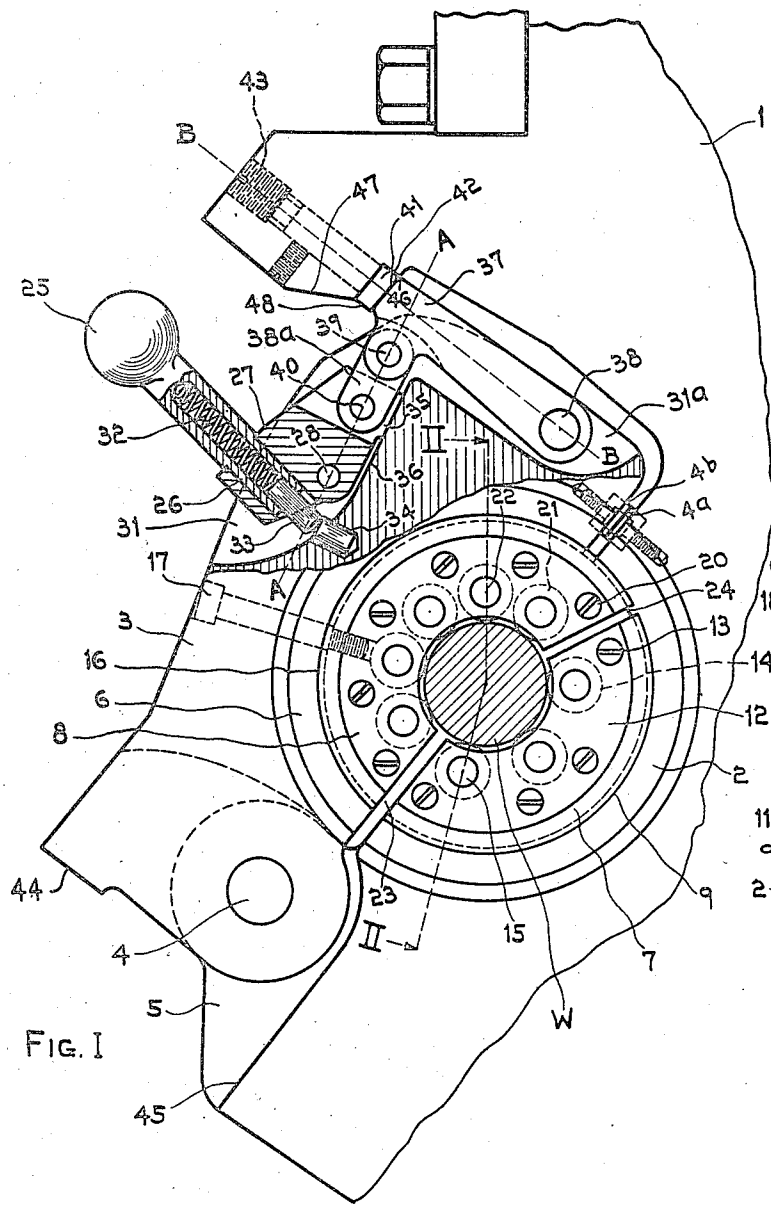


FIG. I

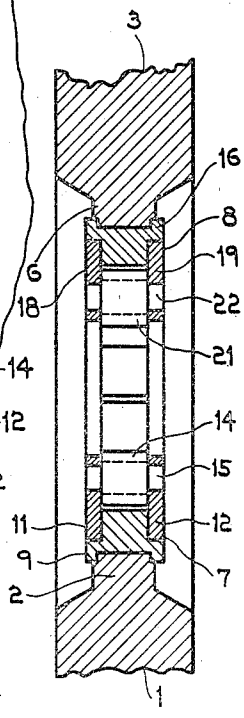


FIG. II

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STEADY REST FOR CRANKSHAFT LATHES

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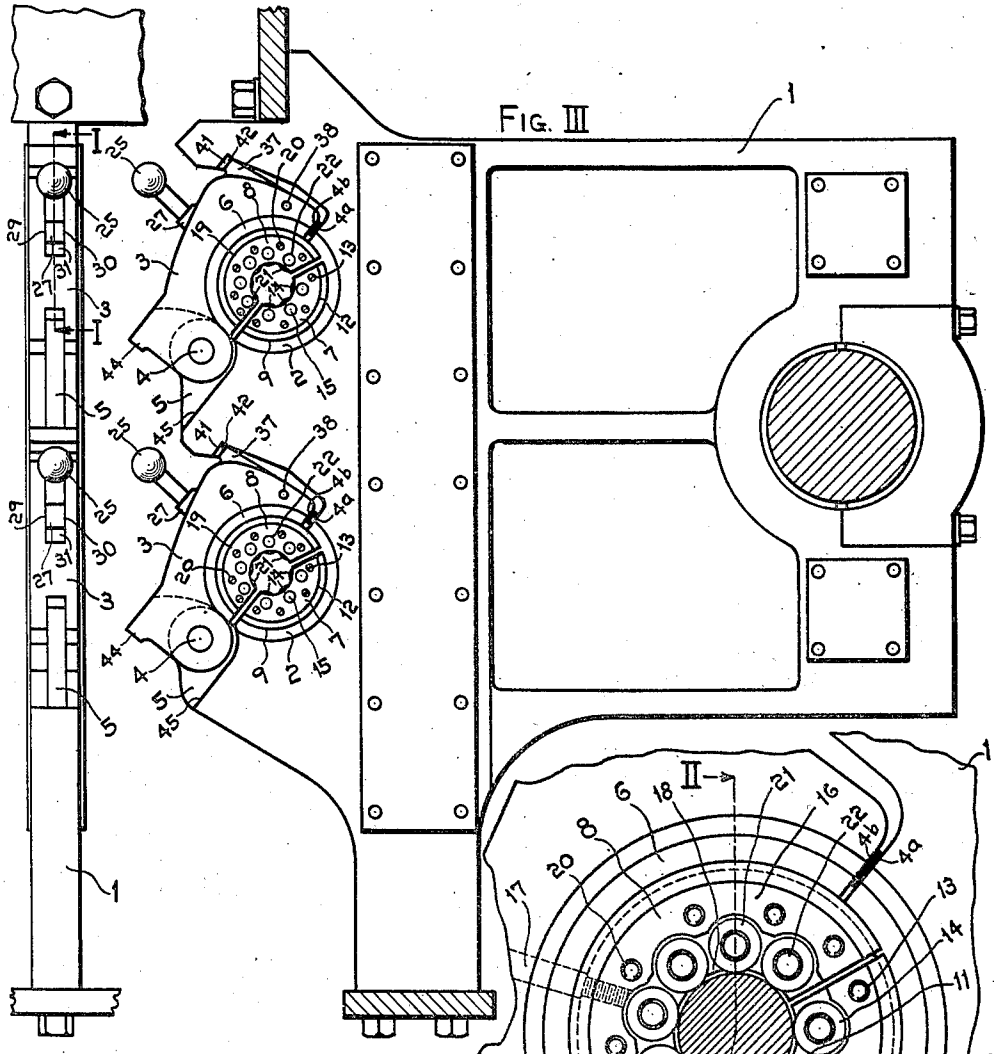


FIG. III

FIG. IV

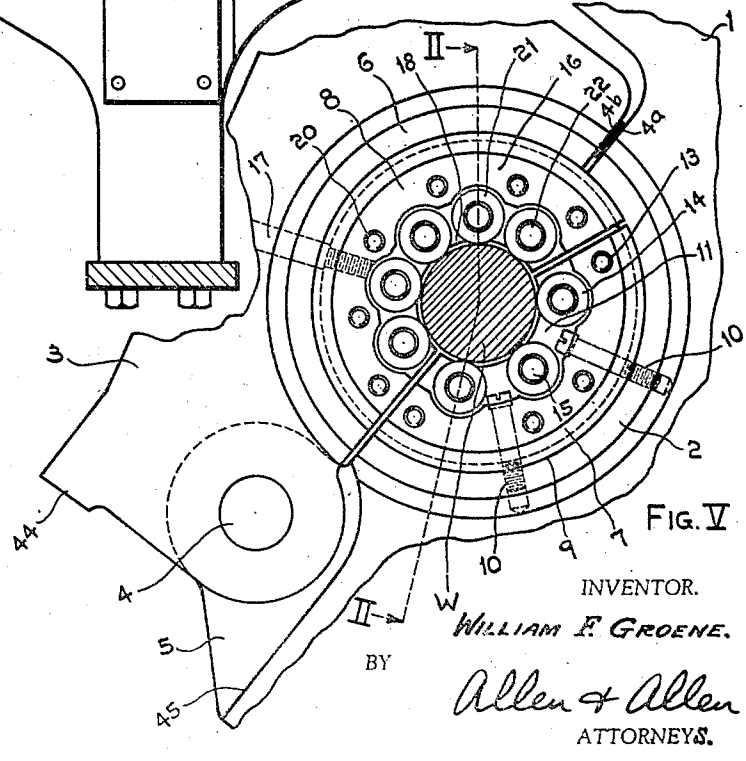


FIG. V

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Patented June 29, 1937

2,085,357

UNITED STATES PATENT OFFICE

2,085,357

STEADY REST FOR CRANKSHAFT LATHES

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Application October 28, 1936, Serial No. 108,038

11 Claims. (Cl. 82—39)

My invention relates to devices whereby the bearings of crankshafts which are being turned in a lathe may be held in steady position. This invention is particularly applicable to lathes known as orbital or pin turning lathes either of the single or multiple spindle type.

It has been found in lathes of these types, particularly where the turning of all of the pins at one operation is an objective, that unless great care is taken in mounting the journals of the shaft, the tremendous work strains may set up vibrations which can build up to the extent of causing the machine itself to break down, as well as ruining the work and the tools.

In crankshaft lathes of the type indicated the rapidity of the turning operation is such that the loading and chucking of work pieces in these lathes must be accomplished likewise in a very rapid manner.

An object of my invention is to provide a steady rest which positively clamps about the work piece and which is manipulated by a single control lever.

Another object is to provide in a steady rest comprising a fixed bearing member and a movable clamping member a single lever adapted to move the clamping member to and from holding position and in addition to lock and unlock the clamping member when in work holding position.

Still another object is to provide in a steady rest comprising a fixed bearing member and a movable clamping member, a single manipulating lever on the clamping member which serves both to move the clamping member and to lock and unlock said member when in work holding position.

A further object of my invention is to provide in a steady rest comprising a fixed bearing member and a movable member an arrangement of anti-friction rollers for maximum durability and ease of replacement.

Further objects and features of my invention will appear from the following description of the drawings, in which:

Fig. I is a side elevation partly in section on line I—I of Fig IV of the steady rest, viewed along the axis of work rotation.

Fig. II is a section through the anti-friction roller assembly on the line II—II of Figs. I and V.

Fig. III is a side elevation of a steady rest unit of a typical orbital lathe showing a plurality of steady rests of my invention applied thereto.

Fig. IV is a front elevation of the steady rest unit and steady rests shown in Fig. III.

Fig. V is a side elevation of the steady rest anti-friction roller assembly as shown in Fig. I but with a side plate removed to more clearly show the position of the rollers.

The steady rest comprises the usual frame 1, typical of lathes of the type shown in Patent 1,934,530, having the fixed bearing portion 2 formed integral with the frame 1 and the hinged clamping member 3 pivotally mounted on the pin 4 fixed in the lug 5 of the frame 1. The clamping member 3 also has a bearing portion 6. Fixed on the bearing portions 2 and 6 are the respective anti-friction roller cartridges 7 and 8. The cartridge 7 comprises the arcuate member 9 secured to the bearing portion 2 by means of suitable screws 10 (Fig. V) and side plates 11 and 12 fixed to the member 9 by suitable screws 13. Between the side plates 11 and 12 are rotatably mounted the rollers 14 on studs 15 supported in the side plates 11 and 12, the rollers 14 being so arranged as properly to support and journal a work piece W in the steady rest.

Likewise the cartridge 8 comprises the arcuate member 16 secured to the bearing portion 6 by means of a suitable screw 17 and side plates 18 and 19 fixed to the member 16 by suitable screws 20. Between the side plates 18 and 19 are rotatably mounted the rollers 21 on studs 22 supported in the side plates 18 and 19, the rollers 21 being so arranged as properly to support and journal the work piece W in the steady rest when the clamping member 3 is swung over the work piece. Suitable locating abutments 4a and 4b are provided for maintaining proper relationship between the cartridges 7 and 8 and the work piece W. A novel construction involved in these cartridges 7 and 8 is that they do not separate on a diametral parting line, but along the lines at 23 and 24 so that one cartridge will be of greater and the other of less than semi-circular extent. The purpose of this arrangement is to allow a greater number of rollers 21 to be applied in one cartridge than in the other so as to provide more adequate resistance to distortion of the work piece W in the line of cutting tool pressure while at the same time permitting opening and closing of the movable steady rest member 3.

The manipulating and locking mechanism for the clamping member 3 is actuated by the single lever 25 which is fixed in the bore 26 in the rocking member 27. The rocking member 27 is pivotally mounted on the stud 28 fixed in the clamping member 3 so that the rocking member 27 is free to move between the faces 29 and 30 of the slot 31 (Fig. IV). A spring 32 mounted in the

lever 25 urges the plunger 33 outward against a suitable hardened pin 34 in the clamping member 3, whereby yieldingly to urge the rocking member 27 at all times in locking direction, normally keeping the projection 35 of the rocking member 27 against the bottom 36 of the slot 31.

In a slot 31*a* in the clamping member 3 is pivotally mounted the latch 37 on the stud 38 fixed in the member 3. The latch 37 is connected to the rocking member 27 by means of the link 38*a* mounted to swivel on the pin 39 in the latch 37 and the pin 40 in the rocking member 27. The arrangement of these three pivotal connections 28, 39, and 40 provides a toggle action mechanism whereby the latch 37 is normally thrust out of the slot 31*a* under the influence of the spring 32 in handle 25. The pivotal connections 28, 39 and 40 are arranged to be in a straight line A—A when the latch 37 is thrust fully outward, thereby positively holding the latch in that position. The latch 37 can only be withdrawn from this outward position by pulling forward and down on the lever 25.

A hardened abutment 41 mounted in the frame 1 is arranged for sliding engagement with the end 42 of the latch 37 and is made adjustable thereto by means of the set screw 43 threaded in the frame 1. It can thus be seen that when the latch is thrust outward by the mechanism described, the clamping member 3, when engaged over the work piece W, will be positively locked between the locating abutments 4*a* and 41. It is to be noted that the latch will remain engaged with the abutment 41 without assistance from the toggle mechanism described as the pressure tending to open the clamping member 3 is set up along the line B—B substantially perpendicular to line of motion of the end 42 of the latch 37. The toggle arrangement serves automatically to force the latch 37 into engagement with the abutment 41; to provide positive means to hold the latch in said engagement; and to provide sufficiently powerful means to withdraw the latch should it become bound against the abutment 41.

The operation of this steady rest is extremely simple and rapid. In order to unclamp the work piece W as seen in Fig. I, the operator merely pulls the lever 25 forwardly and downwardly. This motion first withdraws the latch 37 and then causes the clamping member 3 to swing away from the work. A suitable lug 44 on the clamping member, striking the abutment 45 on the frame 1, limits the outer swinging movement of the clamping member. The work W may then be unloaded or loaded in the machine. In closing the clamping member, the member is raised and swung over the work by means of the lever 25, the lever being held slightly forward so as to prevent the positive toggle action along the line A—A from becoming effective until the abutments 4*a* and 4*b* are fully engaged. Normally when the lever 25 is so held during the initial stages of closing the clamping member over the work W, the edge 46 of the latch 37 will come in contact with the face 47 on the frame 1 and 48 of the abutment 41 so as automatically to maintain this relationship during the final stages of swinging the clamping member, and finally permitting automatic full engagement of the latch 37 with the abutment 41 when the abutment 4*a* and 4*b* are engaged.

Having thus fully described my invention, what I claim is:

1. A steady rest for lathes comprising a frame, a fixed journal member mounted in said frame, a movable clamping member pivotally mounted on said frame for swinging relative to said fixed journal member, abutment means to limit the relative approach of said members, means for positively holding said movable member engaged with said abutment means, and common means for rendering said last mentioned means effective or ineffective and for moving said movable member.

2. A steady rest for lathes comprising a frame, a fixed journal member mounted in said frame, a movable clamping member pivotally mounted on said frame for swinging relative to said fixed journal member, a stop to limit the relative approach of said members, a latch mounted in said movable member, an abutment on said frame engageable by said latch whereby said movable member is held in positive engagement with said stop when in clamping position, and a single lever for operating said latch and swinging said movable member.

3. A steady rest for lathes comprising a frame, a fixed journal member mounted in said frame, a movable clamping member pivotally mounted on said frame for swinging relative to said fixed journal member, a stop to limit the relative approach of said members, a latch mounted in said movable member, an abutment on said frame engageable by said latch whereby said movable member is held in engagement with said stop when in clamping position, a lever pivotally mounted on said movable member, and a toggle joint between said latch and said lever whereby said latch may be moved by said lever, said lever also serving as the means for swinging the movable member to clamping and unclamping position.

4. A steady rest for lathes comprising a frame, a fixed journal member mounted in said frame, a movable clamping member pivotally mounted on said frame for swinging relative to said fixed journal member, a stop to limit the relative approach of said members, a latch mounted in said movable member, an abutment on said frame engageable by said latch whereby said movable member is held in engagement with said stop when in clamping position, a lever pivotally mounted on said movable member, and a toggle joint between said latch and said lever whereby movement of said lever brings said toggle joint into a straight line whereby positively to hold said latch in locking contact with said abutment when said movable member is in clamping position.

5. A steady rest for lathes comprising a frame, a fixed journal member mounted in said frame, a movable clamping member pivotally mounted on said frame for swinging relative to said fixed journal member, a stop to limit the relative approach of said members, a latch mounted in said movable member, an abutment on said frame engaged by said latch whereby said movable member is held in engagement with said stop when in clamping position, a lever pivotally mounted on said movable member, a toggle joint between said latch and said lever whereby movement of said lever can bring said latch in locking contact with said abutment when said movable member is in clamping position, and resilient means for normally urging said toggle joint into said straight line.

6. A steady rest of crankshaft lathes comprising a frame and a plurality of steady rest devices on said frame each comprising a fixed jour-

nal member mounted in said frame, a movable clamping member pivotally mounted in said frame to swing relative to said fixed journal member, a movable locking member mounted on said clamping member, and a single means for swinging said movable member to or from clamping position and to lock or unlock said locking member when in clamping position.

7. A steady rest for crankshaft lathes comprising a frame and a plurality of steady rest devices on said frame each comprising a fixed journal member mounted in said frame, a movable clamping member pivotally mounted on said frame to swing relative to said fixed journal member, and means for swinging said movable member to or from clamping position and to lock or unlock said movable member when in clamping position comprising a latch pivotally mounted on said movable member, an abutment on said frame engageable by said latch, a lever pivotally mounted on said movable member, a toggle joint connecting said lever to said latch, a stop in connection with said lever to stop said toggle when in a straight line, and resilient means for urging said lever against said stop.

8. A steady rest for crankshaft lathes as set forth in claim 7 wherein a stop is provided to limit the outward swinging movement of said movable member.

9. In a steady rest for lathes comprising a fixed journal member and a movable journal member, anti-friction journal portions in said members, comprising arcuate cartridges one in each member containing rollers mounted for free rotation and to bear against a cylindrical surface of the work piece being turned, one of said arcuate cartridges being of greater than semi-circular extent, the other cartridge being of less than semi-circular extent.

10. A steady rest for lathes comprising a fixed journal member and a movable clamping member, a latch mounted in said movable member, an abutment associated with said fixed journal member, means to cause said latch to automatically engage said abutment so as to hold said movable member in clamping position, and common means for disengaging said latch from said abutment and for moving said movable member from clamping position.

11. A steady rest for lathes comprising a fixed journal member and a movable clamping member, a latch mounted in said movable member, an abutment associated with said fixed journal member, means to cause said latch to automatically engage said abutment so as to hold said movable member in clamping position, and common means for disengaging said latch from said abutment and for moving said movable member to and from clamping position.

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