March 29, 1927. 1,622,292

L. RENO

LATHE

Filed April 14, 1924 2 Sheets-Sheet 1

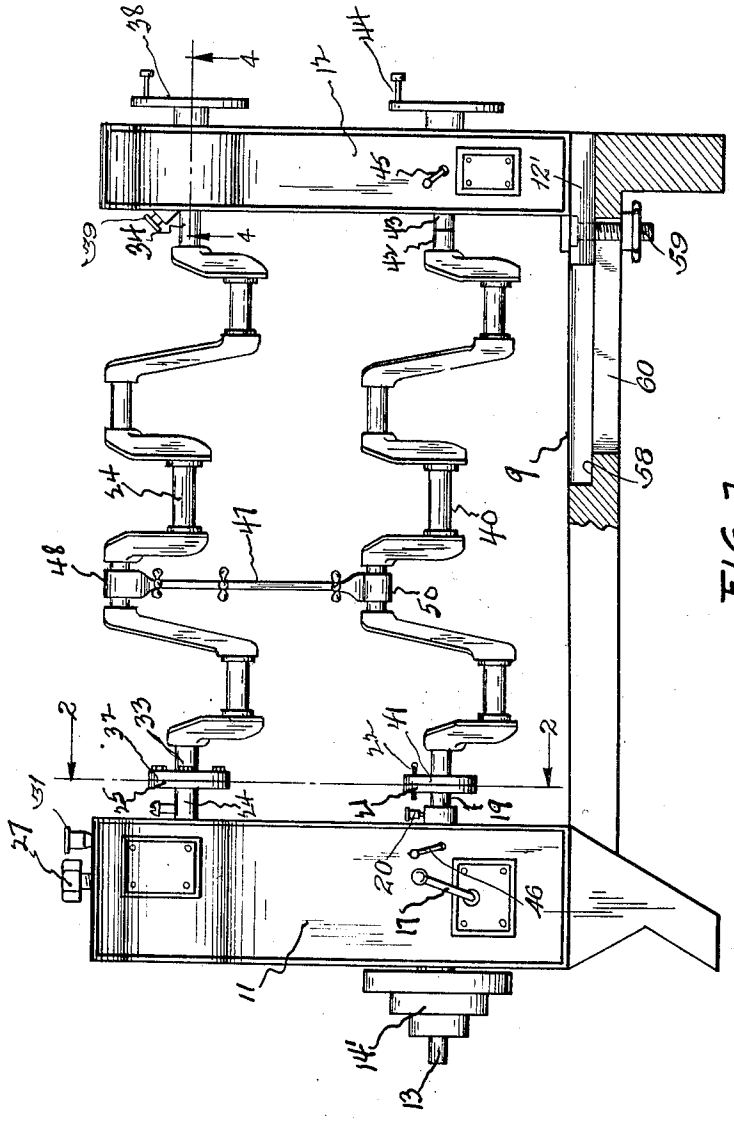


FIG. 1

INVENTOR.
Leo. Reno

BY

Thos. Donnelly
ATTORNEY.

March 29, 1927. 1,622,292

L. RENO

LATHE

Filed April 14, 1924 2 Sheets-Sheet 2

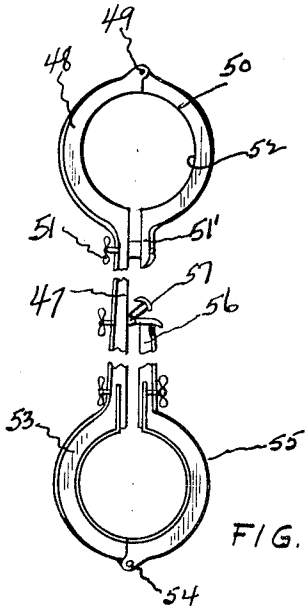


FIG. 5

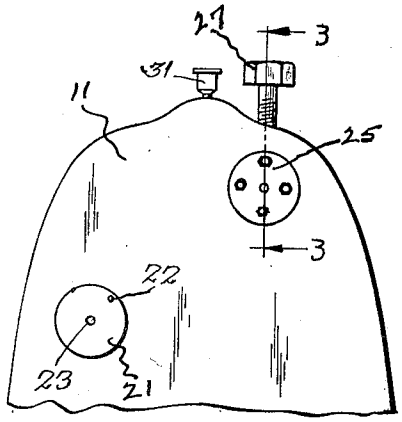


FIG. 2

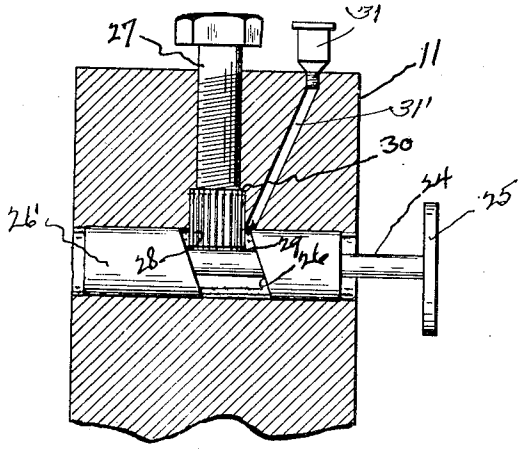


FIG. 3

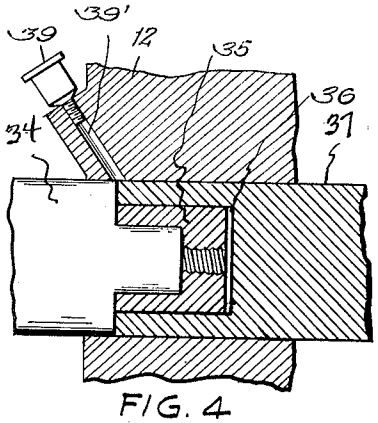


FIG. 4

INVENTOR.
Leo Reno.

BY

ATTORNEY.

Patented Mar. 29, 1927. 1,622,292

UNITED STATES PATENT OFFICE.

LEO RENO, OF FLINT, MICHIGAN.

LATHE.

Application filed April 14, 1924. Serial No. 706,296.

My invention relates to a new and useful improvement in a lathe adapted for supporting a plurality of crank shafts co-operatively arranged for effecting the polishing of the bearings of the crank shafts without the necessity of an operator manually supporting the polishing member during the polishing operation. To provide a lathe of this nature is one of the objects of this invention, as well as to provide a lathe of this class so arranged as to reciprocate the polishing member relatively to the crank shaft being polished during the polishing operation.

Another object of the invention is to provide a lathe, having a polishing supporting member mounted thereon, adapted for positioning upon a crank shaft to be polished, and also providing means for rotating said crank shaft while said polishing member is attached thereto.

To effect the results set out, I have also provided specific means for effecting the supporting and reciprocal movement of the polishing member, as well as the crankshaft to be polished, and the provision of this specific means also forms an object of this invention.

Other objects will appear hereinafter.

The invention consists in the combinations and arrangements of parts hereinafter described and claimed.

The invention will be best understood from a reference to the accompanying drawings which form a part of this specification and in which,

Fig. 1 is a side elevational view of the invention showing a crank shaft mounted thereon,

Fig. 2 is a fragmentary sectional view showing a part in elevation and illustrating the reciprocating operating mechanism used in the invention,

Fig. 3 is a sectional view, taken on substantially line 3—3 of Fig. 2,

Fig. 4 is a sectional view illustrating the method of mounting the supporting crank shaft used in the invention,

Fig. 5 is a side elevational view of a polishing member adapted for use with the invention.

The specific arrangement and structure of the polishing member used with the invention is not set out in detail as the polishing member, itself, forms no part of this application, the same being covered in another application for patent filed by me. The polishing member may be of such structure and arrangement as will make a practical device for use with the method and arrangement of the supporting members and lathe, in general, which form the subject of this invention.

The invention, in its preferred form, comprises a supporting table 9, constructed as are commonly known lathe beds. Projecting upwardly from the bed 9, at one end thereof, is a stationary head 11, and mounted slidably on the bed, at the opposite end, is a head 12 provided with a dove-tailed member 12′ adapted to slide in a dove-tail groove 58 formed in the bed 9. A bolt 59 fixed to the member 12′ projects into the slot 16 so that the head 12 can be locked in its adjusted position. Suitably journalled in the head 11, is a horizontally extending shaft 13, carrying a clutch head 14 at its inner end, and provided with the cones 14′ at its outer end upon which suitable belting may be positioned for transmitting power to the shaft 13. A suitable two-way clutch is connected to the shaft 13, operable by a handle 17, the construction and arrangement of this clutch being of conventional type and not forming any part of this invention. Fixedly mounted upon the shaft 19, at the exterior end thereof, is a disk 21 having a center 23 projecting therefrom, and, eccentrically thereof, a locking pin 22 projecting therefrom. A suitable oil cup 20 is mounted on the bearing. Journalled in the head 11 is a shaft 24, to the free end of which, and projecting over the bed 9, is attached a disk 25, provided with bolt holes around its circumference. The shaft 24 is provided with an enlarged portion 26′ in which is formed a cam groove 26 adapted for the reception of a set of roller bearings 28, which are suitably mounted in rings 29 and 30 and fixedly attached to a screw 27 threaded into the head 11. A suitable oil cup 31 and a lubricant channel 31′ is provided in the head 11 for the bearings.

In use, a dummy crankshaft is used, one end 33 of which is provided with a disk 32 which is bolted to the disk 25. The opposite end 34 is provided with a head 35 which is threaded thereon and adapted for loose engagement in a socket 36, formed in the tail stock 37. This tail stock is provided with the usual operating wheel 38 for moving the tail stock longitudinally of the bed.

An oil cup 39 and a lubricating channel 39' is provided in the head 12 for the bearings.

In operation, the crank shaft 40, which is to be polished, is provided at one end with a disk 41 having a plurality of holes formed therein within its marginal edges. The center pin 23 engages the center of the shaft which projects through and terminates flush with the disk 41. The pin 22 engages in one of the holes formed within the marginal edges of the disk 41, so that a rotating of the shaft 13 will cause a rotating of the crank shaft 40, the shaft 19 being connected, at will, by operation of the clutch handle 17, to the shaft 13, to rotate therewith. The opposite end 42 of said crank shaft being engaged by the tail stock 43 provided with an operating handle 44 for moving the same longitudinally of the bed. A locking handle 45 is provided for locking the tail stock 43 in its adjusted position and a similar locking handle 46 is provided for locking the tail stock 37 in adjusted position. The detailed structure of these locking handles is not set out, as the same is a matter of common knowledge to those skilled in the art and forms no part of this invention. Upon assembling the dummy crank shaft, or, as it may be termed, a supporting crank shaft, as the same serves to support the polishing member, upon the lathe in the manner indicated, a rotating of the shaft 13 will cause a rotating of the crank shaft which is held in position by the tail stock 43 and by the disk 21.

The polishing member used comprises a carrying arm 47 having a semi-circular bearing portion 48 which is hingedly connected, at 49, to a co-operating semi-circular bearing member 50. Babbitt, or other suitable wearing material 52 being mounted within these members for engagement with the cranks of the dummy crankshaft.

A wing nut 51 co-operates with a bolt which is projected through the carrying arm 47 and through the extension 51' of the member 50 to bind the members 48 and 50 in co-operative relation. The arm 47 is provided with a semi-circular portion 53 which is hingedly connected, at 54, to a semi-circular co-operating portion 55, having an outwardly extending arm 56 which is held in fixed relation to the carrying arm 47 by a suitable clip or bolt 57. Positioned interiorly of the members 53 and 55, so as to engage the periphery of a crank positioned within the same, is a suitable polishing material; such as, carborundum, emery cloth, or the like. When these arms are mounted upon the dummy crankshaft and upon the bearing surfaces of the crank shaft to be polished, the shaft 13 may then be set into rotation. The width of the polishing members is made preferably less than the width of the bearing surfaces to be polished. This is done to prevent any possible binding of the polishing member on the flanges projecting from the bearing surfaces. Similarly, the width of the supporting members 48 and 50 are made of less width than the bearing surfaces of the dummy crank shaft which supports them for the same reason. Upon rotating the shaft 13, the crank shaft to be polished, being set in rotation, will, through the carrying arms 47 and the associated parts, cause a rotation of the dummy shaft. As the shaft 24 is set in rotation, the engagement of the bearings 28 in the cam groove 26 will cause a reciprocal movement of the shaft 24 and thereby a reciprocal movement of the dummy crank shaft. As this reciprocal movement takes place during each revolution, the polishing member, which is in embracing relation to the bearings of the crank shaft to be polished is moved longitudinally of these bearings so that the polishing member is brought into engagement with all portions of the bearing to be polished. The arrangement of the mounting of the end 34 of the dummy shaft in the tail stock 37 is such as to permit the longitudinal movement of the shaft end 34 relatively to the tail stock 37. The block 35 is set into reciprocal movement in the slot 36 during the rotation of the dummy crank shaft. The adjustment of the tail stock 37 is to provide for a suitable use of dummy crank shafts varying slightly in length.

The mounting of the shaft 24 is not in vertical alignment with the mounting of the shaft 13, so that vertical planes extended through the longitudinal axes of the shaft 24 and the shaft 13 will lie parallel to each other. The purpose of arranging these shafts out of vertical alignment with each other is to facilitate the operation of the machine in assembling and disassembling crank shafts to be polished. When the polishing member is removed from the crank which has been polished, the arm 47 remains loosely attached to the bearing of the dummy crank shaft. Upon removing the polishing members from the bearing which has been polished, the arm 47 normally swings downwardly from its supporting member, which, being out of vertical alignment with the crank bearing polished, causes the arm to hang vertically a distance away from the crank polished. This obviates any obstruction resulting from the polishing members hanging from the dummy shaft while the shaft to be polished is inserted or removed from the lathe. It also prevents any undue swinging of the arms 47 in case the crank shaft to be polished should be set in rotation before the polishing members were attached thereto.

While I have illustrated and described the preferred form of structure, I do not

wish to limit myself to the precise form of structure shown but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A lathe adapted for use in polishing crank shafts, comprising a crank bearing supporting member; means for supporting said crank bearing member; means for supporting rotatably a crank shaft to be polished adjacent said crank bearing member; means for rotating said crank shaft; and polishing means associated with said crank shaft and said crank bearing member for effecting the rotation of said crank bearing member upon the rotation of said crank shaft.

2. A lathe adapted for use in polishing crank shafts, comprising a rotatable supporting member reciprocally mounted on said lathe; a crank bearing member carried by said supporting member and adapted for rotation therewith; a longitudinally, stationary rotatable member mounted on said lathe and adapted for carrying a crank shaft to be polished; means for connecting the oppositely disposed cranks of said crank bearing member and said crank shaft for effecting the polishing of said crank shaft; and means for reciprocating said reciprocal carrying member during the rotation thereon.

3. In a lathe of the class described, means for supporting the opposite ends of a crank shaft for permitting the rotation thereof; and means for supporting a crank bearing member rotatably, said crank bearing supporting means being out of vertical alignment with said crank shaft supporting means.

4. In a lathe of the class described, means for supporting a crank shaft at its opposite ends for permitting the rotation thereof; and means for supporting a crank bearing member rotatable and longitudinally shiftable, said means being out of vertical alignment with said crank shaft supporting means.

5. In a lathe of the class described, a tail stock, having a socket formed in the operative end thereof; and a filler block adapted for loose positioning in said socket, said filler block being provided with a threaded socket for the reception of the threaded end of a work piece.

6. In a crank shaft polishing device of the class described, a crank shaft supporting member adapted for the reception of a crank shaft; means for rotating said crank shaft; a polishing member associated with said crank shaft for polishing the cranks thereof; a supporting member for said polishing means; and means for swingably connecting said supporting member to said polishing means for permitting the travel of said polishing means in unison with said cranks; and means for moving said polishing member axially of said crank shaft.

7. In a crank shaft polishing device of the class described, a crank shaft supporting member adapted for the reception of a crank shaft; means for rotating said crank shaft; a polishing member associative with said crank shaft for polishing the crank thereof; an arm projecting outwardly from said polishing member; supporting means pivotally connected to said arm adjacent one end thereof, the point of connection of said supporting means with said arm being fixed axially of said arm, the point of support of said arm, upon rotation of said crank shaft, travelling in an arc, said polishing member approaching and withdrawing the location of travel of said arc during operation.

In testimony whereof I have signed the foregoing specification.

LEO RENO.