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DEVICE FOR BABBITTING CONNECTING ROD OR OTHER BEARINGS

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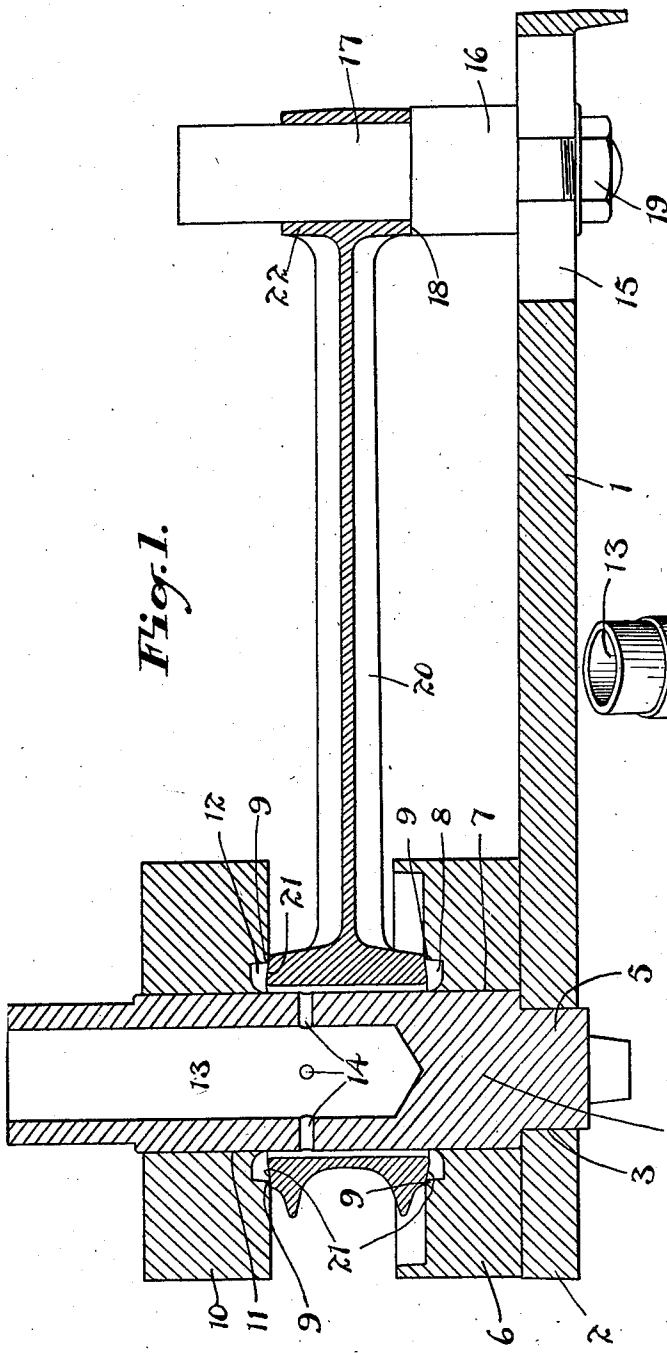


Fig. 1.

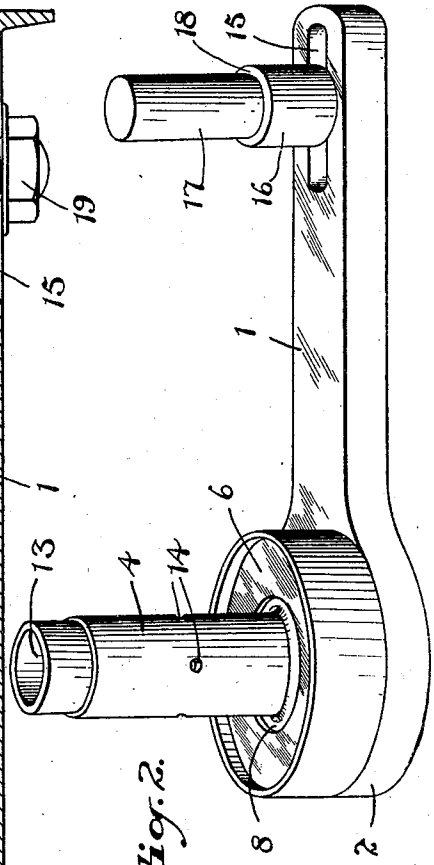


Fig. 2.

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UNITED STATES PATENT OFFICE

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DEVICE FOR BABBITTING CONNECTING ROD OR OTHER BEARINGS

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The principal objects of the invention are to simplify the work of babbitting connecting rods or bearings and to minimize the time required for the operation.

The principal feature of the invention consists in providing a hollow mandrel which serves as a core and having a pair of metal discs fitting thereover adapted to confine the metal at either end of the bearing, the melted babbitt metal being fed to the bearing from the interior of the core.

A further feature resides in the use of heavy metal discs which are arranged over the core member so that they engage the ends of the bearing and offer a chilling influence to the babbitt at each end of the bearing so that leakage of the babbitt therepast is prevented.

In the drawing Figure 1 is a sectional elevation of a device constructed in accordance with this invention showing a connecting rod arranged in position for babbitting.

Figure 2 is a perspective view of the device on a reduced scale, showing the upper disc removed.

Various means have been devised for the purpose of rebabbitting worn connecting rods of internal combustion engines, but such means have usually been cumbersome in operation, requiring considerable time in setting up and offering limited assurance of satisfactory results.

The present invention completely eliminates these undesirable features reducing to a minimum the time required and ensuring uniform results.

In the preferred form of the invention, as illustrated in the drawings, the base 1 which may be of cast metal is formed with an enlarged circular portion 2 at one end thereof, the upper surface of the base and circular portion being preferably finished in a flat plane surface.

A hole 3 is bored centrally of the enlarged portion of the base and extends at right angles to the upper plane surface thereof.

A cylindrical mandrel 4 is provided having the end 5 reduced to form a snug fit in the bore 3, so that the mandrel 4 extends upwardly at right angles to the base.

A heavy metal disc 6 provided with a central bore 7 is adapted to be slipped over the mandrel 4 and rests on the portion 2 of the base, the mandrel 4 being a snug fit in the bore 7. An annular recess 8 of suitable width and depth is cut in the upper surface of the disc 6 surrounding the bore 7 and forming an annular shoulder 9 therearound.

A second heavy disc 10 of metal is provided with a central bore 11 therethrough and is adapted to be slipped on to the mandrel 4 above the disc 6 and is provided with an annular recess 12 on the lower surface similar in form to the recess 8 in the disc 6 and forming the annular shoulder 9.

The mandrel 4 is provided with a central passage 13 extending downwardly from the top thereof, and a plurality of small passages 14 extend radially outward therefrom through the wall of the mandrel.

Extending longitudinally of the free end of the base 1 is a slot 15 and slidably arranged therein is a bolt member 16 having a reduced stem portion 17 extending vertically thereabove at right angles to the base 1 and providing an annular shoulder 18 at its base.

A nut 19 is threaded on the lower end of the bolt 16 for the purpose of clamping the same in any desired position longitudinally of the slot 15.

In the use of the device for babbitting a connecting rod the device is arranged as shown in Figure 2 of the drawings. The mandrel 4 which is to form the core of the mold is heated to a fairly high temperature and is placed in position and the lower metal ring 6, which is not heated, is slipped thereover.

The connecting rod 20, after being heated is placed in position on the device, the big end resting on the disc 6 in such a manner that the machined edge 21 of the rod is engaged around its periphery by the annular shoulder 9 in a light substantial sealing contact.

The small end 22 of the rod, is slipped over the reduced portion 17 of the bolt 16, the lower edge of the end 22 resting on the shoulder 18 and maintaining the conecting rod in proper alignment.

Should the connecting rod require to be adjusted longitudinally in order to effect its exact centering around the mandrel 4 this can quickly be accomplished by loosening the nut 19 and sliding the bolt in the proper direction.

The upper disc 10 which is also cool is then placed in position on the upper end of the mandrel and the annular shoulder 9 engages the upper machined edge of the rod and forms a substantial seal thereagainst.

The bearing is now ready to be cast and the molten babbitt metal is poured into the passage 13 in the upper end of the mandrel until the same is filled.

The molten babbitt flows readily out of the passage 13 through the small radial passages 14 filling the space between the connecting rod and mandrel and flowing into the recesses 8 and 12 of the discs 6 and 10 respectively.

Immediately upon the molten babbitt coming in contact with the cooler surfaces of the discs 6 and 10 a chilling influence results and the babbitt metal being thus reduced in temperature sets rapidly with the result that practically none of the molten metal succeeds in leaking past the shoulders 9 of the discs.

However, should any of the metal escape before being arrested by the chilling, the loss will be immediately compensated by the reserve body of molten babbitt within the mandrel 4, which being under a considerable head the babbitt metal being extremely heavy, a very dense wear resisting bearing will be formed. The metal will be forced into all the crevices displacing the air and preventing the formation of air pockets in the finished bearing.

The connecting rod and mandrel being previously heated, the actual bearing portion of the bearing will cool more slowly than the outer ends adjacent the cool discs and consequently any shrinkage in the slowly cooling metal will be at once compensated by the reserve molten metal within the mandrel.

When the metal has set sufficiently to warrant handling, the upper disc 10 is shifted off the mandrel and the mandrel 4 along with the connecting rod is removed from the base.

The connecting rod may then be secured in a vice or other suitable means and the mandrel 4, which is preferably slightly tapered, is struck a sharp blow on the upper end, the metal projecting into the small feed passages 14 being thus sheared off flush with the outer periphery of the mandrel.

If desired in order not to burr or mar the top of the mandrel, a blunt ended punch may be inserted into the upper end thereof and resting on the babbitt therein may be struck with a hammer, the solid core of babbitt remaining in the core after the casting operation receiving the shock and preventing the damaging of the mandrel by being continually struck.

The mandrel when thus removed from the connecting rod may then be placed for a few moments in a pot of melted babbitt and the babbitt within the core passage will readily melt and run therefrom whereupon the mandrel, while still hot, may again be placed in position on the base 1 in readiness for the casting of the next bearing.

It has been found preferable in order to avoid delay that a number of discs be made up so that the discs, which become slightly heated by the casting operation, may be substituted by cooler discs so that a cool surface will at all times be presented to the poured babbitt at the outer ends of the bearing, this being the only place where leakage might occur.

The lower disc 10 is preferably provided around its outer periphery with an upturned flange so that should any appreciable amount of babbitt find its way past the shoulders 9 of the discs due to discrepancies in the connecting rod, the same will be confined and may be readily removed after cooling.

The device described may be employed with equal success on various types of bearings as well as connecting rods, and the annular grooves 8 and 12 may be formed to any desired shape, or in the casting of certain flat ended bearings may be dispensed with entirely leaving the flat surface of the discs to contact with the hot babbitt, in order to effect its rapid cooling and consequent retention.

The base of the device may be made to any suitable length in order to accommodate connecting rods of various lengths, and the base may be slotted for a considerable length to provide scope for adjustment.

A still finer longitudinal adjustment of the connecting rod in the device may be accomplished by substituting for the member 17 a cylindrical member mounted eccentrically of the bolt 16, which member may be rotated the desired fine adjustment.

A device such as described is extremely simple to operate and will ensure a uniform and very rapid production.

What I claim as my invention is:—

1. A device for babbitting connecting rod or other bearings comprising a hollow metal mandrel adapted to extend centrally through the bearing and having a plurality of radial passages therethrough to direct molten bearing metal between said bearing and said mandrel, and means arranged at each end of said mandrel to close the openings at the ends of the mandrel, said mandrel being adapted to be driven axially from the bearing to shear the bearing metal at the passages.

2. A device for babbitting connecting rod or other bearings comprising a hollow metal mandrel adapted to extend centrally through a bearing, a plurality of small radial pas-

sages in the wall of said mandrel for conducting molten bearing metal to said bearing, and rings loosely arranged on said mandrel beyond said passages and adapted to engage the bearing at each end and to close the opening of the ends of the mandrel, said mandrel being adapted to be driven axially from the bearing to shear the bearing metal at the passages.

3. A device for babbitting connecting rod or other bearings comprising a base, a hollow metallic mandrel extending upwardly from said base, a pair of rings adapted to fit snugly over said mandrel and to confine a bearing therebetween, and a plurality of radial passages through the wall of said hollow mandrel between said confining rings connecting the hollow interior of the mandrel with the bearing interior, said mandrel being adapted to be driven axially from the bearing to shear the bearing metal at the passages.

4. A device for babbitting connecting rod or other bearings comprising, a base. a hollow metallic mandrel removably resting on said base and extending thereabove at right angles thereto, an annular ring closely encircling said mandrel and resting on said base and adapted to support a bearing thereabove, a second annular ring adapted to be slipped over the top of said mandrel and to engage the upper edge of a bearing, and a plurality of separate radial passages in said mandrel for conducting molten bearing metal to the bearing in a distributed flow, said mandrel being adapted to be driven axially from the bearing to shear the bearing metal at the passages.

5. A device for babbitting connecting rod or other bearings comprising a metal mandrel adapted to extend through a bearing, an annular ring encircling each end of the mandrel and engaging the bearing at the ends adjacent its outer periphery, a central bore extending downwardly from the top of said mandrel, and a plurality of radial passages of restricted cross-section extending from said central bore through the wall thereof and adapted to conduct molten bearing metal from said central bore to the bearing in a distributed flow.

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