July 30, 1940. W. L. R. SCHOLFIELD 2,209,495

MEANS FOR HOLDING AND TREATING BEARINGS

Filed April 5, 1937

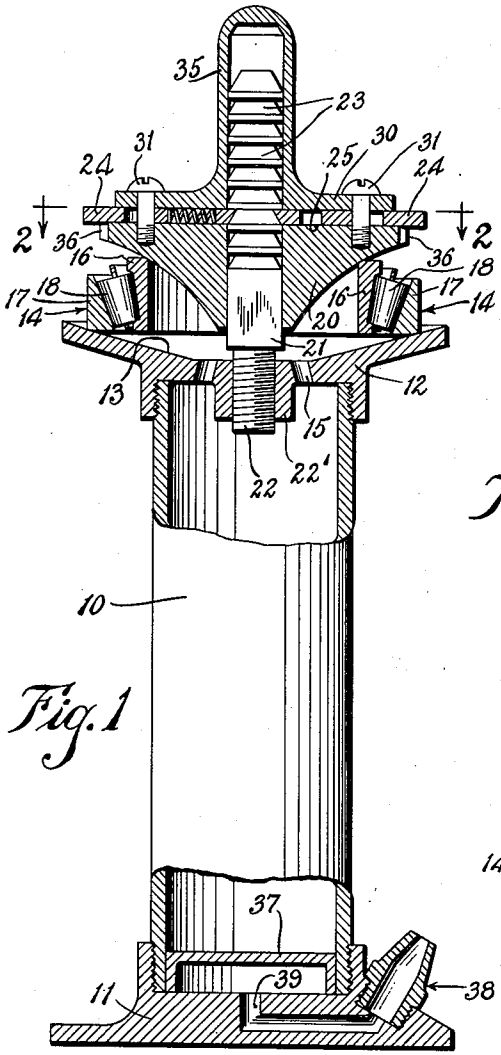

Fig. 1

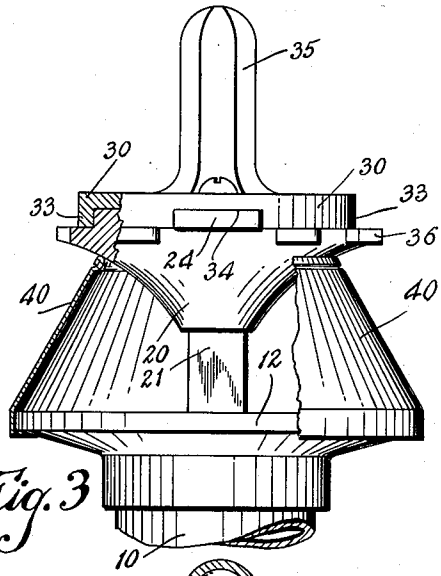

Fig. 3

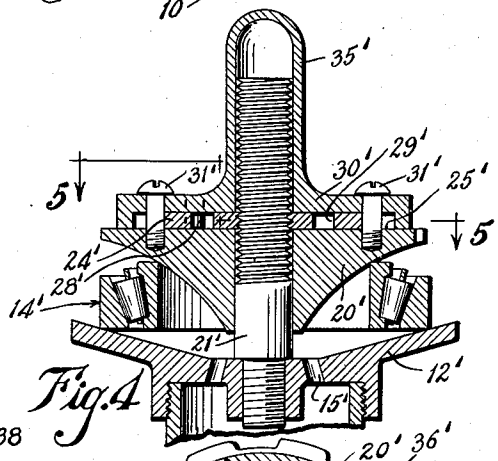

Fig. 4

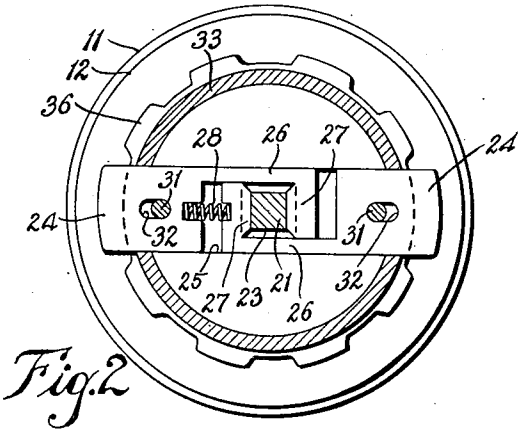

Fig. 2

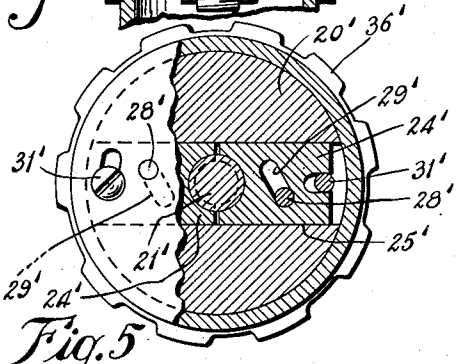

Fig. 5

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MEANS FOR HOLDING AND TREATING BEARINGS

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9 Claims. (Cl. 279—8)

This invention relates to the art of cleaning and/or lubricating bearings, and more particularly to means for holding said bearings during the treatment thereof.

It is an object of the present invention to provide improved means for holding bearings and the like while treating the same.

It is another object of the invention to provide holding means for bearings, which may be readily and rapidly applied to, and removed from, said bearings.

It is a further object of the invention to provide improved means for supporting a bearing structure and means for automatically centering and holding said bearing on its support.

It is another object of the invention to provide means for protecting the supporting and holding means when not in use.

It is still a further object of the invention to provide a device of the character referred to, by which large quantities of bearings may be economically treated, due to the facility in the application and removal of the holding means with respect to the bearing.

This invention possesses many other advantages and has other objects which will be made more easily apparent from a consideration of the embodiments thereof shown in the accompanying drawing and forming part of the present specification. I shall now proceed to describe these forms in detail, which illustrate the general principles of my invention; but it is to be understood that this description is not to be taken in a limiting sense, since the scope of the invention is best defined in the appended claims.

Referring to the drawing:

Figure 1 is a vertical sectional view (partly in elevation) showing an apparatus embodying one form of my invention.

Figure 2 is a section taken as indicated by line 2—2 of Figure 1.

Figure 3 is an elevation of the upper end of the apparatus shown in Figure 1 with certain parts broken away for illustrative purposes, showing the means employed for protecting the bearing treating material remaining therein from foreign matter when the apparatus is not in use.

Figure 4 is a vertical sectional view through the upper portion of an apparatus embodying a modified form of my invention, and

Figure 5 is a view taken as indicated by line 5—5 of Figure 4.

Referring more in particular to Figures 1, 2, and 3, the form of my invention illustrated therein, comprises a hollow cylinder or barrel 10 for containing a cleaning fluid, lubricant, or the like. The lower end of said cylinder is open and is threadedly connected with a base 11.

The upper end of the cylinder 10 is closed by a detachable head 12 into which it is threaded. The head is formed with a conical upper face 13, which forms a seat for a bearing structure such as the bearing 14, and the central portion of said head is provided with a number of passages 15, through which the material contained within the cylinder 10, is applied under pressure, to the bearing structure, in a manner hereinafter fully described.

For purposes of illustration the bearing structure 14 is shown as being of a type commonly employed on the front wheels of automobiles. Such bearings comprise an inner race 16 and an outer race 17 between which are held a plurality of rollers 18 in a well-known manner. The rollers are so mounted between the races as to provide space between adjacent rollers, and also to provide a running clearance between said rollers and said races. These spaces and clearances provide passages into and through which material from the cylinder 10 is adapted to be forced.

The conical seat 13 forms a continuous line of contact with the outer race 17 of the bearing structure 14, and a conically shaped clamping member 20 forms a continuous line of contact with the inner bearing race 16. Thus, when the bearing structure is under pressure between the seat 13 and the conical clamping member 20, a chamber is formed, the only outlet therefrom, being through the spaces between the rollers 18, and the clearances between said rollers and the bearing races. The only communication between said chamber and the interior of the cylinder 10, is through the passages 15 in the head 12.

The clamping member 20 is slidably mounted on a stem 21, and is releasably attached thereto in a manner hereinafter described. The stem 21 is supported from the head 12, and is adjustably secured thereto through the threaded connection between the reduced lower end 22 of said stem and the centrally disposed boss 22' formed on the head. Thus, it will be obvious how a rotative movement of said stem will result in a corresponding axial movement thereof. It will further be obvious how the clamping member 20 will also be moved in an axial direction when it is secured to the stem and rotated therewith.

The means provided by the present form of my invention, for releasably attaching the clamping member 20 to the adjustable stem 21, is as follows. The stem 21 is square in cross sectional configuration and slidably receives the clamping member 20, which is provided with a centrally

disposed square opening therethrough for receiving said stem. The faces of the square stem 21 are provided with horizontal grooves 23, and the clamping member 20 carries a pair of retractable latches 24, which are adapted for engagement with the grooves in oppositely disposed faces of the stem 21, so that said clamping member may be locked in various positions on the stem.

The latches 24 are slidably contained in a diametrical recess 25 formed in the upper face of the clamping member 20. Said latches are formed with narrow extended portions 26, having toothed portions 27 extending at right angles thereto for engagement with the grooves in opposed surfaces of the stem 21. A coil spring 28 normally acts upon the latches 24 to urge the toothed portions thereof into engagement with the grooves in the stem 21, for positively locking the clamping member 20 in adjusted position on said stem. The clamping member 20 may be released for sliding movement on the stem, by pressing the latches inwardly so as to hold the toothed portions thereof, out of engagement with the grooves in said stem.

The latches 24 are retained within the recess 25 by a cap 30, which is secured to the upper face of the clamping member 20 by the screws 31. Said screws pass through slots 32 in the latches 24, whereby to permit the movement of the latches a sufficient distance to disengage their toothed portions from the grooves in the stem 21. The cap 30 is formed with an annular flange 33 surrounding the upper end of the clamping member 20 (Figure 3), and said flanged portion is provided with diametrically opposed notches 34 through which the outer ends of the latches 24 extend. A shield 35 is formed on the cap 30 for enclosing the upper end of the stem and protecting the same from dust and other foreign matter. The outer surface of the shield 35 is formed to accommodate a wrench or the like for rotating the stem 21 with the clamping member locked thereon, when it is desired to produce a greater pressure against the bearing 14 than can be accomplished by rotating said members by hand, through the grip elements 36 formed on the clamping member 20.

In operation, the bearing structure being disposed upon the seat 13, the clamping member is lowered upon the stem 21 until its conical surface rests upon the bearing structure, it being understood that the latch teeth are free to retract during said lowering movement, due to the cooperative inclined faces of the grooves and latch teeth. The clamping member is restrained against removal by the engagement of the upper faces of the latch teeth with the cooperative horizontal surfaces of the grooves. Said clamping member may then be rotated with the stem, for tightening the same against the bearing structure. The clamping member may be readily released and quickly removed from the stem by pressing inwardly on the latches.

The cylinder 10 being filled with the desired material, fluid pressure is applied behind the floating piston 37 through the fitting 38 and an intercommunicating passage 39, thereby forcing the material through the passages 15 into the chamber defined between the seat 13 and the conical surface of the clamping member 20. Continued pressure causes the material to enter or pass through the bearing structure. When the device is not in use, a shield 40 is provided between the seat 12 and the clamping member 20 (Figure 3), for protecting the residue of material remaining on said parts against the accumulation of foreign matter or detrimental effects of the atmosphere.

The conical construction of the bearing engaging surfaces on the head 12 and the clamping member 20 permits the accommodation of a large range of bearings of varying sizes on the same apparatus, and provides means for automatically centering said bearings. It may be desired in certain instances, to provide suitable gaskets (not shown), on said bearing engaging surfaces.

In the modified form of my invention shown in Figures 4 and 5, the stem 21' is threaded into the head 12' and is stationarily secured thereto. Said stem is provided with threads 23' in lieu of the grooves 23 provided in the form of the invention heretofore described. The conically shaped clamping member 20' carries a pair of latches 24' in a slot 25' provided in its upper side. The innermost ends of said latches are provided with threaded portions which are adapted to cooperatively engage the threaded stem 21'. The latches are positively moved into and out of engagement with the stem 21' by pins 28' carried by the cap 30' and operatively engaging cam slots 29' formed in said latches. The cap 30' is secured to the clamp 20' by screws 31', and said cap is formed with a shield 35' the outer surface of which provides means for turning by hand or suitable tool.

In operation, the latches 24' are sufficiently retracted to prevent engagement of their threaded ends with the stem 21', when the clamping head 20' is lowered thereon into engagement with the bearing structure 14'. The latches are then moved into engagement with the stem as shown in Figure 5, by rotating the cap 30' in a clockwise direction, causing the pins 28' to act upon one side of the cam slots. Continued rotation of the cap results in a tightening of the clamping member against the bearing structure. This tightening action may also be accomplished by rotating the clamping device by means of the grip elements 36' formed on the clamping member 20'. To remove the clamping device, the latches are disengaged from the stem 21' by rotating the cap 30' in a counter-clockwise direction, whereby said device can be readily and quickly lifted from said stem.

I claim:

1. In a device for holding bearing structures, means forming a seat for the bearing structure, a stem, said stem being fixed with respect to said seat and disposed centrally thereof, a clamping member telescoping over said stem in cooperation with said seat for holding said bearing structure therebetween, said stem and clamping member having engageable parts releasable one from the other for permitting unrestrained movement of said member with respect to said stem, said parts being engageable to effect supplemental movement of said member to clamp the structure to said seat.

2. In a device for holding bearing structures, means forming a seat for the bearing structure, a stem, said stem being fixed with respect to said seat and disposed centrally thereof, a clamping member telescoping over said stem and engageable with said bearing structure to hold the same against said seat, and means carried by said clamping member and movable into and out of engagement with said stem for locking the clamping member to said stem at different positions longitudinally thereof.

3. In a device for holding bearing structures, a seat for the bearing structure, a stem fixed with

respect to said seat, a clamping member telescoping over said stem and engageable with said bearing structure to hold the same against said seat, and means carried by said clamping member and movable into and out of engagement with said stem for locking the clamping member to said stem at different positions longitudinally thereof.

4. In a device for holding bearing structures, means including a seat for the bearing structure, a stem threadedly secured to said means, a clamping member telescoping over said stem and engageable with said bearing structure to hold the same against said seat, means carried by said clamping member and movable into and out of engagement with said stem for locking the clamping member to said stem at different positions longitudinally thereof, said clamping member being adapted to effect rotation of said stem and produce longitudinal movement thereof with respect to said first mentioned means.

5. In a device for holding bearing structures, means including a seat for the bearing structure, a stem secured to said means, a clamping member telescoping over said stem and engageable with said bearing structure to hold the same against said seat, a retractable latch carried by said clamping member, said stem being provided with a plurality of grooves adapted to receive said latch for locking the clamping member to said stem at different positions longitudinally thereof.

6. In a device for holding bearing structures, means including a seat for the bearing structure, a stem adjustably threaded to said means, a clamping member telescoping over said stem and engageable with said bearing structure to hold the same against said seat, a retractable latch carried by said clamping member, said stem being provided with a plurality of grooves adapted to receive said latch for locking the clamping member to said stem at different positions longitudinally thereof, said clamping member and stem being provided with cooperable parts, whereby rotation of said member will rotate said stem and move its threaded portion in said means to effect longitudinal movement of said stem with respect to said means.

7. In a device for holding bearing structures, a seat for the bearing structure, a stem fixed with respect to said seat, a clamping member telescoping over said stem and engageable with said bearing structure to hold the same against said seat, a retractable latch carried by said clamping member, said stem having a threaded portion cooperable with said latch for locking the clamping member to said stem at different positions longitudinally thereof, said latch being engageable with said threaded portion to effect longitudinal movement of said clamping member upon rotation thereof and releasable from said threaded portion to permit bodily translation of said member along the stem.

8. A clamping device including cooperative clamping members, a stem secured to one of said members and having a threaded portion encompassed by the other of said members, said last mentioned member having recesses on opposite sides of said stem, a latch in each recess slidable radially to and from said threaded portion, each latch having a portion engageable with said threaded stem portion to produce longitudinal movement of said last mentioned member upon its rotation relative to the stem, said last mentioned member being freely movable lengthwise of the stem upon disengagement of said latch portions from said threaded stem portion.

9. A clamping device including cooperative clamping members, a stem secured to one of said members and having a plurality of grooves encompassed by the other of said members, said last mentioned member having means slidably guiding a latch in its movement to and from said grooved stem portion, control means rotatably carried by said last mentioned member, a pin and slot connection between said control means and latch operative to produce slidable movement of said latch to and from said grooved stem portion upon rotary movement of said control means.

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