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PISTON WRIST PIN SETTING TOOL

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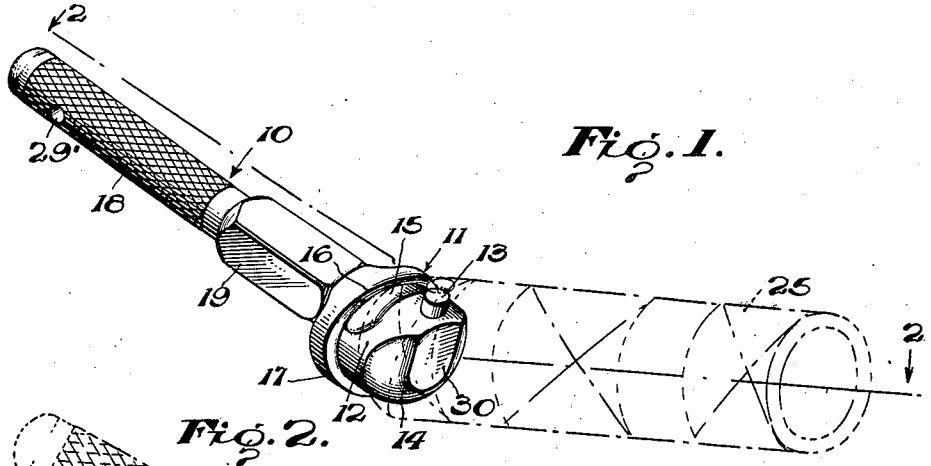


Fig. 1.

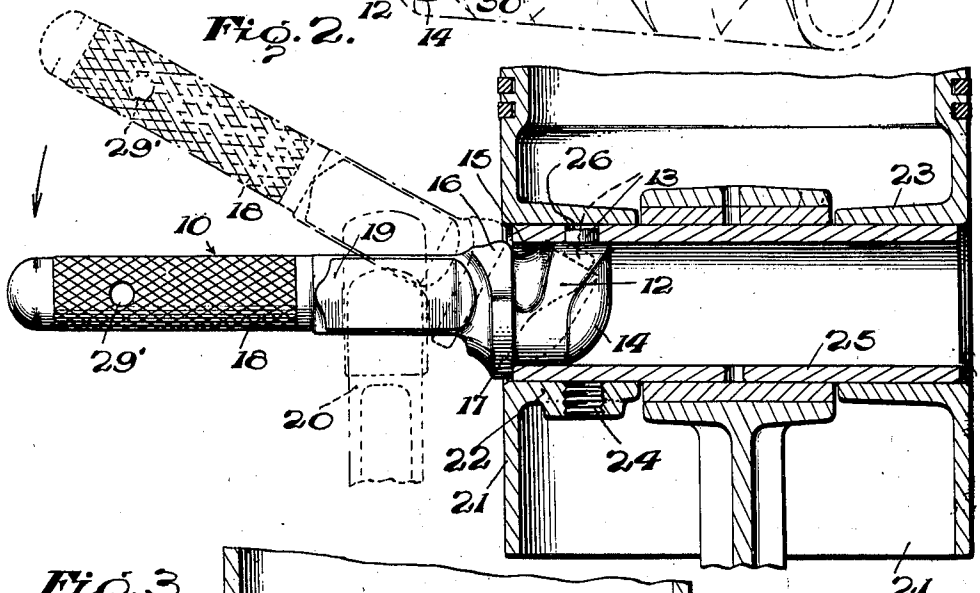


Fig. 2.

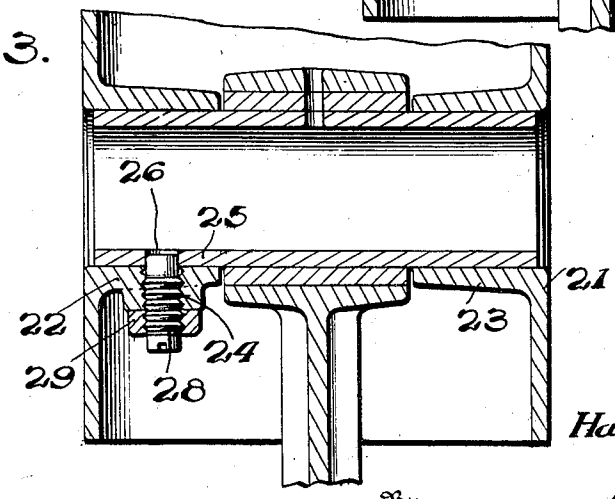


Fig. 3.

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PISTON WRIST PIN SETTING TOOL

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4 Claims. (Cl. 29—88.2)

The present invention relates to tools to be applied to wrist pins, bushings, or the like for rotating or moving the same axially or longitudinally of the object or piece of work in which they are inserted.

In many instances, after a wrist pin has been placed in a piston, it becomes necessary to align a radial hole in the wrist pin with a like hole in one of the piston bearings which receive the wrist pin, so that a keeper bolt or set screw may be inserted in the aligned holes to secure the wrist pin against rotation. Considerable difficulty may be encountered in aligning these holes unless a tool constructed particularly for this purpose is available.

The present tool is constructed particularly for such use and includes means for guiding and facilitating the insertion and removal of the tool from a wrist pin or bushing.

With the foregoing and other objects in view, the invention will now be more fully described, reference being had to the accompanying drawing in which:

Figure 1 is a perspective of the tool constituting the present invention.

Figure 2 is a side elevation of the tool inserted in a wrist pin, and

Figure 3 is a sectional view of a piston and wrist pin after the present tool has been utilized in aligning the holes in the pin and piston so that a set screw or keeper bolt may be applied.

Referring now to the drawing, the numeral 10 designates generally the tool of the present invention. This tool comprises a rigid body or head 11 having a cylindrical surface or annular surface 12 which is of substantially the same circumference as the inside circumference of a wrist pin or bushing to which the tool is to be applied. A lug 13 projects radially from what may be considered the top of the tool and this lug lies within the confines of the cylindrical surface or annular portion 12 as clearly shown in Figures 1 and 2.

The body portion is provided with a curved and what may be considered a partially spherical portion 14 extending from the front end of the body rearwardly to the cylindrical surface or annular portion 12. The purpose of this curved portion 14 is to provide a lower, reduced portion on the body which cooperates with another upper reduced portion 15 to provide sufficient clearance to permit the insertion and removal of the tool without any binding between the tool and the interior of the piston pin, as will be described in greater detail hereinafter. The reduced portion 15 is on the opposite side of the cylindrical surface 12 from the portion 14, that is, the portion 15 is adjacent the top of the tool and directly in rear of the lug 13.

The body 11 is also provided with a raised portion 16 directly in rear of the reduced portion 15 and constituting an abutment for engaging the edge of a wrist pin to limit the inward movement of the tool within the wrist pin and permitting the tool to swing about the edge of the wrist pin as a pivot so that the lug 13 may be guided into a radial hole in the wrist pin, as will be described in greater detail hereinafter.

The opposite sides of the raised portion 16 of the body gradually merge into a more pronounced enlargement forming a flange 17 which engages the rear lower portion of the cylindrical surface or annular portion 12. This flange 17 constitutes an abutment adapted to contact the edge of the wrist pin and limit the movement of the body 11 as the tool is inserted into the wrist pin.

The tool is provided with a handle 18 joining the body portion and forming therewith an integral rigid tool. The portion of the handle adjacent the body is provided with a plurality of flat surfaces forming a squared area 19 to accommodate a wrench 20 whereby the tool may be rotated after its insertion into the wrist pin so as to align up the radial holes in the pin and piston.

Referring to Figure 2, there is disclosed a sectional view of a piston 21 having registering bearings 22 and 23. Bearing 23 is provided with a threaded hole or opening 24. The numeral 25 represents a wrist pin or piston pin which has been inserted in the piston within the bearings 22 and 23. This wrist pin may be of a well known construction which is provided with a radial hole or opening 26 adjacent one end thereof. In many instances, after a wrist pin of this type has been inserted into its piston, it is necessary that the hole 26 be aligned with the hole 24 in the piston bearing 22 so that a set screw or keeper bolt may be screwed into the aligned holes to secure the wrist pin in the piston against both longitudinal and rotary movement therein. If these two holes are for any reason out of register, it becomes necessary to align the holes and this is quite a difficult operation unless the correct type of tool is available. The tool of the present invention is designed particularly for such use and may be easily and quickly applied to a wrist pin.

The initial step of inserting the present tool into a wrist pin is shown in dotted lines in Figure 2. As illustrated in this view, the tool is partially

inserted at an angle to the longitudinal axis of the wrist pin and this is facilitated because of the reduced portions 14 and 15, formed in the body of the tool. The tool is inserted until the raised or enlarged top portion 16 abuts the edge of the wrist pin. The abutment 16 is also spaced from the lug 13 a distance to permit the lug to be readily inserted into the hole 26 by swinging the tool about the end of the wrist pin as a pivot. In other words, after the tool has been applied as shown in the dotted line position of Figure 2, the handle portion is then swung downwardly to the full line position. This raises the body so that the lug 13 enters the hole 26. Any further movement of the handle which may tend to jam the tool in the wrist pin or the lug in the opening 26, is prevented by reason of the fact that the flange or lower abutment 17 immediately contacts the edge of the wrist pin, after the lug enters the hole 26. This prevents any further inward swinging movement of the tool.

After the tool has been inserted into the wrist pin as above described, a wrench 20 or other suitable tool may be applied to the squared portion 19 of the handle to rotate the tool. This rotation is imparted to the wrist pin so that the hole 26 may align with the hole or opening 24 in the bearing 22. After the holes have been aligned and while the tool is still inserted within the wrist pin, the set screw 28 may be screwed into the threaded opening 24 so that its inner end will project slightly into the opening 26. It will be observed that the lug 13 is purposely of a thickness so that it will not entirely fill the hole. This provides clearance to permit the inner end of the screw 28 to initially enter the hole 26. Thereafter the tool 10 may be easily and quickly removed by swinging the handle 18 downwardly so that the lug is removed from the hole 26. The reduced portions 14 and 15 permit the tool to be removed in this manner without any binding or jamming. By further screwing up on the set screw 28, it will entirely enter the hole 26, so as to rigidly secure the piston pin in the piston against longitudinal and rotary movement, as clearly shown in Figure 3. If desired, a lock nut 29 may be threaded on the screw 28.

Figure 2 of the drawing shows the opening 26 of the wrist pin as initially being diametrically opposite the threaded opening 24. This has been done primarily to illustrate the tool to its best advantage. It is to be understood that in many instances the piston pins will be initially inserted in the piston so that the holes 24 and 26 are more closely aligned. It is to be further understood that wrist pins of different sizes and diameters will require tools of varying sizes. However, since these motor parts are usually made in standard sizes, it will require the use of a relatively few tools to take care of the different types and sizes of piston pins. It is also to be understood that the present tool may also be used as a bushing puller or remover. In this connection, if it is merely desired to remove a bushing or the wrist pin 25, this may be accomplished by pulling outwardly upon the handle 18. The greater portion of the handle is preferably serrated or roughened to provide a firm grip. Furthermore a hole 29' is formed in the handle so that a bar or tool may be inserted to facilitate either rotation of the tool or a longitudinal movement thereof, such as is necessary to remove a bushing.

It will be observed that the extreme end of the body 11 is provided with a flattened portion 30. If desired the curved portion 14 may be extended to include the portion 30 so as to form a substantially semi-spherical area. This is optional, since the operation of the tool or its coaction with the wrist pin would not be changed or affected.

It is to be understood that the form of the invention shown and described is illustrative of the preferred embodiment, and that such changes may be made without departing from the spirit of the invention as fall within the purview of one skilled in the art and the scope of the appended claims.

I claim:

1. A tool for use with hollow wrist pins or the like, comprising a rigid body adapted to be inserted into an end of a wrist pin and provided with a cylindrical surface of substantially the same circumference as the inside circumference of the wrist pin and adapted when inserted in the end of a wrist pin to have a relatively close fit with the inner surface of the pin, and a lug projecting radially from the cylindrical surface of said rigid body for engagement with a radial hole formed in and adjacent one end of the wrist pin, said lug cooperating with said cylindrical surface to detachably lock the tool to the wrist pin to permit rotation of the wrist pin, said body being provided with spaced reduced portions at opposite sides of the cylindrical surface to provide clearance to permit insertion and removal of the tool without any binding between the tool and interior of the wrist pin, said body having a substantially semi-circular flange projecting radially therefrom and joining the cylindrical surface on the portion of the body opposite the lug and constituting an abutment for engaging an end of the wrist pin when the tool is finally moved to operative position.

2. A tool for use with hollow wrist pins or the like comprising a rigid body adapted to be inserted into an end of a wrist pin and provided with a cylindrical surface of substantially the same circumference as the inside circumference of the wrist pin and adapted when inserted in the end of a wrist pin to have a relatively close fit with the inner surface of the pin, a lug projecting radially from the cylindrical surface of said body for engagement with a radial hole formed in and adjacent one end of the wrist pin, said lug cooperating with said cylindrical surface to detachably lock the tool to the wrist pin to permit rotation of the wrist pin, said body having a partially spherical portion extending from one end thereof to the cylindrical surface at a point opposite the lug, said body having a reduced portion in rear of said lug and on the opposite side of the cylindrical surface from the partially spherical portion and cooperating therewith to provide clearance to permit insertion and removal of the tool without any binding between the tool and interior of the wrist pin, said body having a raised portion in rear of said reduced portion and in line with said lug and constituting an abutment for engaging the edge of the wrist pin to limit the inward movement of the tool within the wrist pin and permit the tool to swing and guide the lug into engagement with the hole in the wrist pin.

3. A tool for use with hollow wrist pins or the like comprising a rigid body adapted to be inserted into an end of a wrist pin and having portions thereof arranged in a circular path and adapted to engage and have a close fit with the inner surface of the wrist pin, and a lug pro-

jecting radially from said body for engagement with a radial hole formed in and adjacent one end of the wrist pin, said lug being rigidly attached to said body, said body being provided with spaced reduced portions to provide clearance by a swinging movement to permit insertion and removal of the tool without any binding between the tool and interior of the wrist pin, one of said reduced portions being in rear of said lug, said body having a raised portion in rear of said last mentioned reduced portion and in line with said lug and constituting an abutment for engaging an edge of the wrist pin to limit the inward movement of the tool within the wrist pin and permit the tool to swing and guide the lug into engagement with the hole in the wrist pin.

4. A tool for use with hollow wrist pins or the like, comprising a rigid body adapted to be inserted into an end of a wrist pin and provided with a cylindrical surface of substantially the same circumference as the inside circumference of the wrist pin and adapted when inserted in the end of a wrist pin to have a relatively close fit with the inner surface of the wrist pin, and a lug rigidly connected to and projecting radially from the cylindrical surface of said body for engagement with a radial hole formed in and adjacent one end of a wrist pin, said lug cooperating therewith to detachably lock the tool to the wrist pin to permit rotation of the wrist pin, said body being provided with spaced reduced portions, one located behind the lug and the other located at the forward edge of the body on the side opposite the lug to provide clearance to permit insertion and removal of the tool by a swinging movement without any binding between the tool and the interior of the wrist pin.

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