

Aug. 18, 1959

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2,899,806

LOG WASHER LOG AND GUDGEON AND METHOD AND APPARATUS
FOR ASSEMBLING THE GUDGEON WITH AND
REMOVING SAME FROM THE LOG

Filed May 17, 1957

2 Sheets-Sheet 1

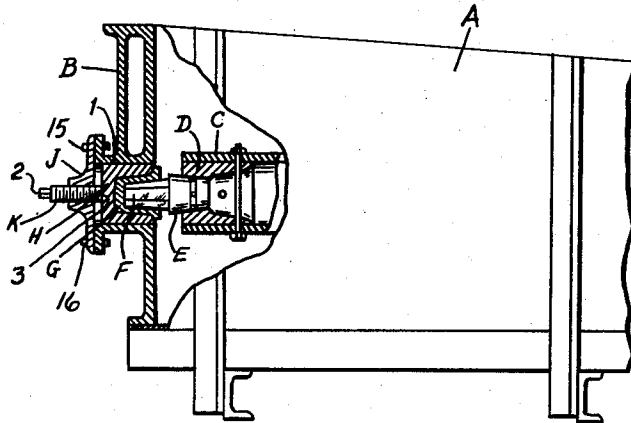


Fig. 1

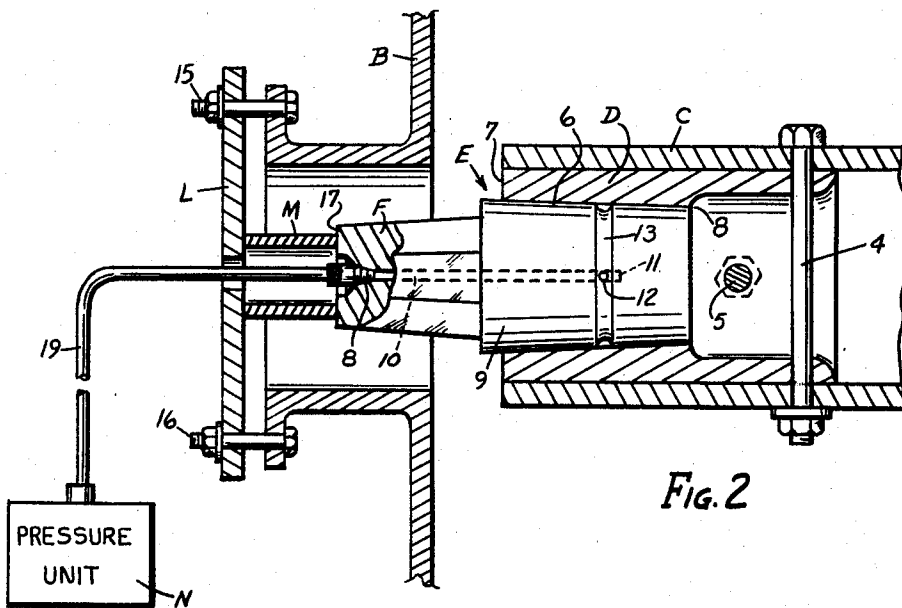


Fig. 2

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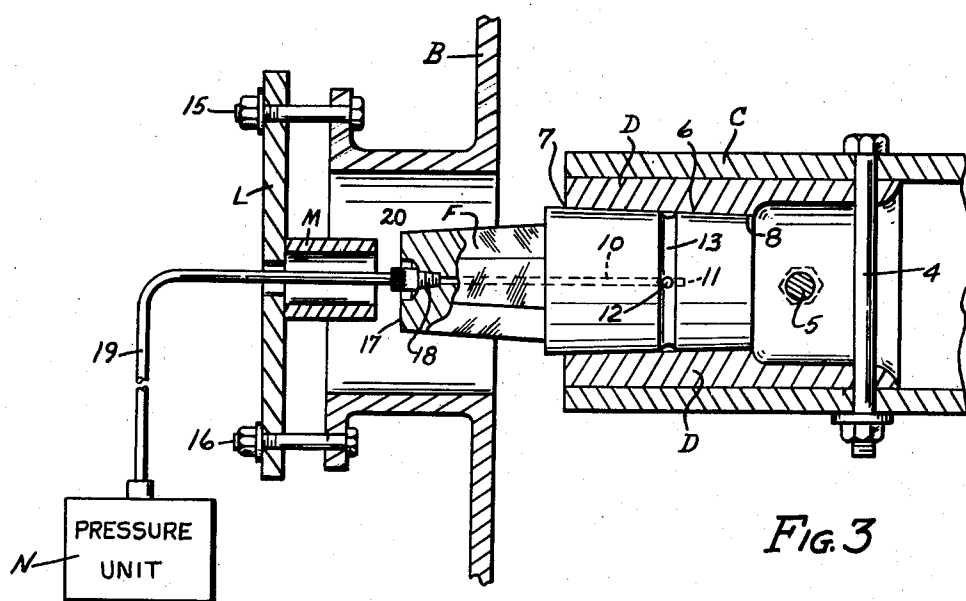
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LOG WASHER LOG AND GUDGEON AND METHOD AND APPARATUS FOR ASSEMBLING THE GUDGEON WITH AND REMOVING SAME FROM THE LOG

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Application May 17, 1957, Serial No. 659,954

4 Claims. (Cl. 64—5)

This invention relates to log washer machines, but more particularly and specifically to a log washer log and gudgeon and a method and apparatus for assembling the gudgeon with and removing the gudgeon from the log.

Heretofore gudgeons have been held in the end of the log by various constructions, one of which has been that of making the gudgeon an integral part of the gudgeon block and then bolting, riveting or welding or otherwise suitably securing the gudgeon block in the log. Such an arrangement is disclosed in the W. A. Fye Patent No. 1,887,151 dated November 8, 1932. Another common means or construction for securing the gudgeon to the log has been that of threading a tapered end of the gudgeon and screwing it into a threaded bore in the gudgeon block.

The present invention employs an entirely different means of securing the gudgeon in the gudgeon block as well as a novel method of assembling the gudgeon in the gudgeon block and removing the gudgeon from the gudgeon block.

It is to be understood that the logs of log washers rotate during the operation of the machine. A gudgeon rotatably supports an end of a log for rotation. Consequently a gudgeon might be termed a trunnion. A gudgeon has an end which is angular in cross sectional configuration and receives a thimble which rotates with the log and gudgeon and which is rotatably supported in a bearing commonly referred to as a hard box. In operation wear occurs between the thimble and the hard box in which the thimble is rotatably supported and when this wear occurs there of course occurs a clearance between these elements. To accommodate and offset this wear, means is provided for pushing the hard box further onto the thimble. However, it has been found that the operators of a log washer often neglect to take up the clearance as it occurs and as a result a looseness occurs between the thimble and the angular shaped end of the gudgeon. As a result of this looseness between the thimble and the gudgeon the gudgeon becomes rounded and this destroys its use and necessitates the removal of the worn gudgeon and its replacement with a new one. With constructions as now known and used it has been found to be very difficult to remove the old worn gudgeon, and the present invention has been conceived to provide a construction and method by which not only can a worn gudgeon be quickly and easily removed from the gudgeon block but also by which a new gudgeon can be quickly yet tightly secured in the gudgeon block.

Another object as well as an improved result of the invention is the accomplishment of an extremely tight driving fit between the gudgeon and the gudgeon block, said fit being what might well be termed a "shrink fit," in that the gudgeon block shrunk upon the gudgeon but without damage to either the gudgeon or the gudgeon block.

Another object of the invention is that of providing a

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gudgeon which is of a simple and comparatively cheap construction and to provide a method of assembling the gudgeon with and removing the gudgeon from the gudgeon block not only quickly and easily but with a comparatively cheap and simple apparatus.

Other objects as well as novel features of construction and also advantages of the invention will appear in and from the following description when read in the light of the accompanying drawings.

10 In the drawings:

Fig. 1 is a view in side elevation of an end of a log washer, the view being partially broken away and appearing in vertical section to illustrate the invention.

Fig. 2 is an enlarged detail view in vertical section illustrating the method of assembling a gudgeon in a gudgeon block.

Fig. 3 is an enlarged detail view in vertical section illustrating the method of removing a gudgeon from a gudgeon block.

Referring first specifically to Fig. 1, A is an end of a log washer box or tank and B an end wall thereof but this element is commonly referred to as a "back plate." A box or tank ordinarily contains two logs and the end of a log C is illustrated. The log is hollow and in the end illustrated is provided with a gudgeon block D which will be hereinafter more specifically described. The gudgeon E has an extending hexagonal shaped end F which has tight driving connection with a thimble G which is rotatable in a hard box or bearing H which is non-rotatably supported in the back plate B but is movable longitudinally therein. The hard box is in an angular shaped bore 1 which extends completely through the back plate. The outer end of this bore is closed by a pressure plate J which carries a threaded adjusting screw K the outer end 2 of which is shaped to receive a tool by which the screw can be rotated so as to force the inner end 3 of the screw against the outer face of the hard box so as to force the thimble tightly on the angular shaped end F of the gudgeon so as to maintain driving connection between the gudgeon and the thimble. In operation as wear occurs, and there is a very considerable amount of wear by reason of the nature of the contents of the washer box or tank, the adjusting screw is supposed to be tightened down so as to maintain tight and non-slippage driving connection between the thimble and the outer extending angular end of the gudgeon.

Because of the human element involved the adjusting screw is not always tightened down as wear occurs between the thimble and the hard box with the result that the driving connection between the thimble and the gudgeon becomes loose and this in turn results in a rounding of the gudgeon end and when this occurs proper driving connection between the gudgeon and the thimble cannot be maintained and it becomes necessary to remove and discard the gudgeon and replace it with a new one.

Having reference to either Figs. 2 or 3, it will be seen that the gudgeon block D is a tubular element of considerable length which snugly fits within the end of the log C. It is securely held in the log by a pair of oppositely extending bolts 4 and 5. The block is internally provided with a tapered axial bore 6 the large end 7 of which is at the outer end of the block with the small end 8 being at the inner end of the block.

The gudgeon E has a tapered barrel-like end 9 of a size to accurately fit the tapered bore 6 of the gudgeon block and an outwardly extending end F which is, as mentioned, of a hexagonal shape to provide driving connection between itself and the hexagonal interior shape of the thimble G. The gudgeon is provided with a longitudinal axial bore 10 the inner end 11 of which ter-

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minates approximately midway the length of the barrel-like portion 9 of the gudgeon. A radially extending bore 12 communicates with the inner end of the bore 10 and leads out to and has an open end in a circumferential groove 13 provided in the gudgeon barrel.

The manner in which the log is rotatably supported at this particular end by the gudgeon has been explained and is illustrated in Fig. 1, and description will now be given of the method and apparatus by which the gudgeon is assembled in the gudgeon block for tight driving connection therewith and by which the gudgeon can be removed from the gudgeon block whenever the necessity arises.

The method and apparatus for assembling the gudgeon in the gudgeon block is illustrated in Fig. 2. Here it will be seen that the several bolts 15 and 16 which removably secure the pressure plate J in place have been removed and the pressure plate along with the adjusting screw have been removed from the machine. Additionally the hard box H has been removed as has also the thimble G. In place of the pressure plate a jack plate L has been substituted which has secured to it by welding or the like, a tube or collar M. The gudgeon has been hand inserted into the bore of the gudgeon block. The same bolts 15 and 16 are used to secure the jack plate to the back plate B and these bolts have been tightened down until the inner end of the tube is in abutment with the face 17 of the outer end of the gudgeon. An end 18 of a hydraulic hose 19 is then secured in the outer end of the gudgeon bore 10. This hose has connection with a portable pressure unit N which has a capacity equal to a five ton jack.

Immediately upon the application of pressure to the bore of the gudgeon this pressure traverses the bore out into the gudgeon groove 13 and exerts its pressure along the face of the bore 6 in the gudgeon block. This pressure results in an expansion, that is an enlargement, of the gudgeon block bore. The bolts 15 and 16 are then tightened down and this forces the gudgeon longitudinally into the enlarged gudgeon block bore. When the gudgeon has been tightly forced into the gudgeon block by drawing up on the bolts 15 and 16 the hydraulic pressure is released. The gudgeon block immediately contracts about the tapered barrel portion of the gudgeon and it has been found that there is a shrink fit between these elements and that the gudgeon is immovable within the gudgeon block both as to longitudinal and rotative movement.

When it is desired to remove the gudgeon from its gudgeon block substantially the same method heretofore described is followed. However, in this instance the jack plate L is positioned to leave a space 20 between the inner end of the tube M and the outer end face 17 of the gudgeon. The same pressure unit and hydraulic hose heretofore described is used. With the application of pressure the gudgeon block is expanded thus increasing the diameter of the gudgeon block bore and a consequent release of the barrel of the gudgeon. Actually the hydraulic pressure causes the gudgeon to move longitudinally outward from its seat in the gudgeon block bore and it is for this reason that the jack plate is utilized. The jack plate is a safety element as the inner end of the jack plate tube M constitutes an abutment which stops the outward movement of the gudgeon to prevent the gudgeon from flying outwardly and injuring a workman or any one standing in the near vicinity.

It is to be understood that the tube M could be made as an integral part of the jack plate L and that rather than bolting the gudgeon block in place this block could be welded into the end of the log. The construction illustrated makes it possible to easily remove the gudgeon block should it be found either necessary or desirable, and this could be an advantage over a construction where the gudgeon block is welded into the log end.

Thus far the invention has been described in connec-

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tion with a log which is assembled or disposed within a washer box. The method, however, can be practiced on a log which is not in a washer box, as would be the case at the time the log is manufactured or in the event a log had been removed from a box. Under these circumstances special bolts are used with the jack plate L in place of the bolts 15 and 16. These special bolts are considerably longer and are provided at their ends with a hook which is caught or engaged behind the paddle bases. Every log is provided with a plurality of paddles at spaced intervals throughout its length and these paddles are secured to bases which are welded to the outside face of the log. It will be seen then that in this instance the jack plate is held by these special bolts which are held against longitudinal movement by reason of the bolts being hooked to the paddle bases. This is a mere substitution of the paddle bases for the back plate B as a means of holding the jack plate against movement.

What I claim is:

1. A gudgeon constructed for rapid and easy tight driving connection with and removal and detachment from a log washer log having an open end within which is secured a gudgeon block provided with a longitudinally extending inwardly tapered seat, said gudgeon having a tapered inner end of a size to snugly and accurately fit within the gudgeon block seat with an outer end disposed outwardly of the block and seat, a bore extending axially of the gudgeon from its outer end and having an inner end terminating at a point substantially midway the length of the tapered inner end of the gudgeon, a radially extending bore having an inner end communicating with the inner end of the longitudinal bore and an outer open end at the outer face of the gudgeon, and a groove encircling the tapered portion of the gudgeon and having communication with the outer end of the radial bore.

2. For use in a log washer, a log having an open end, a gudgeon block secured in the open end of the log and provided with a longitudinally extending tapered seat for the reception of an end of a gudgeon, the larger and open end of said seat being at the outer end of the gudgeon block, a gudgeon having a tapered inner end of a size to snugly and accurately fit within the seat and an outer end disposed outwardly of the seat, a longitudinal bore extending axially of the gudgeon from its outer end, said bore having an inner end terminating at a point substantially midway of the length of the tapered inner end of the gudgeon, a radially extending bore having an inner end communicating with the inner end of the longitudinal bore and an outer open end terminating at the outer face of the gudgeon, and a groove encircling the gudgeon and having communication with the outer end of the radial bore.

3. The method of repeatedly providing a tight driving connection between a tapered seat and the tapered end of an element comprising, shaping and sizing the tapered end of the element to assure a snug fit of the tapered end thereof within the tapered seat, placing the tapered end of the element in the tapered seat, placing an abutment against an extended portion of this element blocking the element against longitudinal movement outwardly from the seat, delivering hydraulic pressure to the face of the seat, building up said pressure until the diameter of the seat is expanded, and forcing the element longitudinally further into the expanded seat and then moving the hydraulic pressure from the seat face and permitting the seat to contract upon the tapered end of the element.

4. The method of removing the tapered end of an element from a tapered seat with which the tapered end of the element has a tight driving connection comprising, delivering hydraulic pressure to the face of the seat, providing an abutment blocking outward movement of the element from the seat, building up said pressure until the diameter of the seat is expanded to a point where the seat loses its grip on the tapered end of the element, and

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simultaneously removing said blocking abutment and utilizing the hydraulic pressure to move the element longitudinally outward from the seat.

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