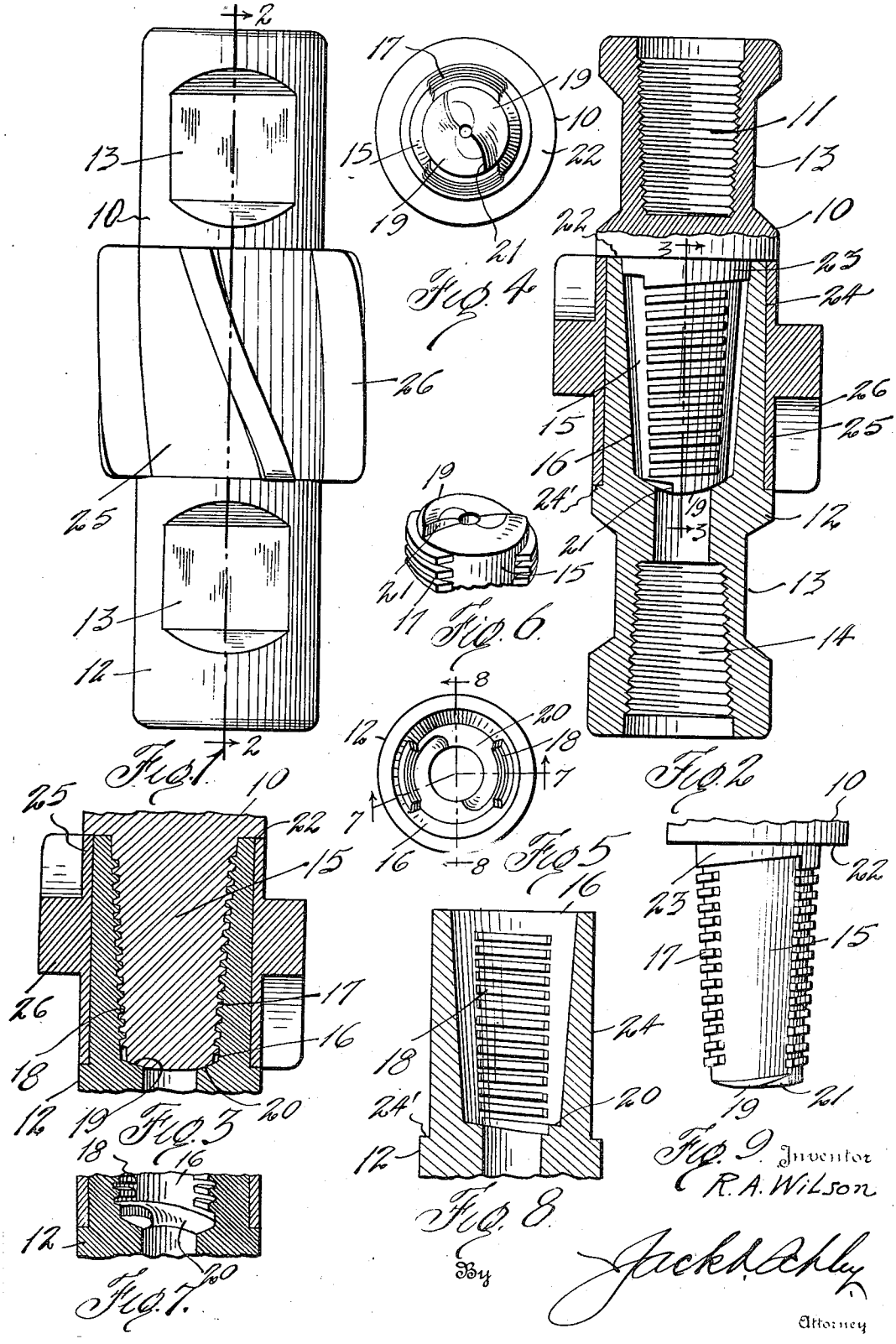
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R. A. WILSON

ROD JOINT

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ROD JOINT.

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This invention relates to new and useful improvements in rod joints.

The object of the invention is to provide a quick-detachable coupling, whereby the joint may be readily made up and quickly disconnected.

A particular object is to provide a rod coupling of the box and pin type having spaced thread panels on the pin adapted to be inserted between spaced thread panels of the box and meshed therewith by a panel rotation of said pin.

A further object of the invention is to provide shoes on the lower end of the pin and guides at the bottom of the well of the box, whereby the thread panels are automatically registered for meshing when the pin is inserted in the box.

Another object of the invention is to provide a plurality of threads, whereby an adequate interlocking and axial alining of the pin and box is assured when the coupling is assembled.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Fig. 1 is an elevation of a joint constructed in accordance with my invention.

Fig. 2 is a vertical sectional view of the same on the line 2—2 of Fig. 1,

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

Fig. 4 is an underside view of the pin,

Fig. 5 is a plan view of the box,

Fig. 6 is a perspective view of the lower end of the pin,

Fig. 7 is a transverse vertical sectional view taken on the line 7—7 of Fig. 5,

Fig. 8 is a vertical sectional view of the upper end of the box taken on the line 8—8 of Fig. 5, and

Fig. 9 is an elevation of the upper portion of the pin at right angles to Fig. 2.

In the drawings the numeral 10 designates a pin member which has a screw threaded socket 11 at its upper end to receive the upper section of the pump rod (not shown). The pin member constitutes one portion or element of the joint; while a box member 12 constitutes the other element or portion of the joint. Each of the members 10 and 12 have wrench faces 13 on opposite sides and when the members are coupled these faces stand in substantially the same or parallel vertical planes; thereby indicating the coupled position.

The box has a screw threaded socket 14 on its lower end for receiving the lower section of the pump rod (not shown). The member 10 has a depending tapered pin 15. The box 12 is formed with a countersunk well 16 for receiving said pin. The pin is formed with mutilated screw threads 17 arranged in two panels each occupying approximately one quarter of the circumference of the pin and disposed diametrically opposite each other. This provides gaps between the panels.

The panels are formed of coarse threads, the convolutions of which are preferably spaced sufficiently to admit the forming of a second thread of the same pitch, intermediate said convolutions. The second thread is started diametrically opposite from the first thread. From the foregoing it will be seen that one of the threads begins at the lower end of one panel; while the other thread begins at the lower end of the diametrically opposite panel. By this arrangement ample thread bearing is had and a coarse thread is available.

The well 16 is provided with double threads 18 which are mutilated and formed into diametrically opposite panels having approximately the same width as the gaps between the panels of the pin, or a little clearance, so that the pin may be easily inserted in the well 16; its threads 17 being received in the gaps of the well. The members are coupled by rotating the pin member to mesh the threads.

A very important feature of the invention is the provision of a pair of shoes or extensions 19 on the bottom of the pin. In forming these shoes it is preferable to start the threads 17 short of the lower end of the pin. To receive and support the shoes at the bottom of the well convolute seats or shoulders 20 are formed contiguous to the threads 18. Each seat extends convolutely under the panel in its forward path and slightly beyond so as to give full clearance. Also each shoe has its advance edge or shoulder 20

terminating short of the advance edge of its panel thereabove, but this is subject to variation.

The shoes 19 have their under surfaces or faces beveled inwardly and downwardly toward the center of the pin and the seats 20 are correspondingly beveled; however this is subject to variation. The threads 17 are spaced in such relation from the faces of the shoes as to readily mesh with the threads 18 when the shoes ride down the seats 20 upon rotation of the pin member 10. It is necessary that the shoes 19 and seats 20 have such inclination or pitch as to properly support the threads 17 for entrance between the threads 18 when the pin member 10 is rotated.

When the pin 15 is inserted in the well 16 of the box the shoes 19 will engage upon the seats 20 at the bottom of the gap between the panels of the threads, 18. It will be noted that the shoes and seats each have a greater radial extension or bearing surface than the threads and thus take the impact and sustain the load which would otherwise be imposed upon the threads. By use of the shoes and seats not only is the load sustained, but the pin threads are supported in position to readily mesh with the box threads without the necessity of lifting or otherwise adjusting the pin member.

The joint is tightened by a quarter turn or rotation of the pin member and this is limited by the contact of the tapered walls of the pin 15 and the well 16, or by an interlocking of the threads due to the pitch of the shoes and seats or by the shoulder 22 at the upper end of the pin 15 binding upon the upper flat edge of the box, or in any other suitable manner. It will be noted that the thread panels 17 of the pin terminate short of the shoulder 22 which leaves an integral guide collar 23 at the upper end of the well. The threads 18 of the well 16 terminate short of the upper end of the well, thus leaving an annular space or socket for receiving the collar 23, which thus becomes a guide for centering the pin before it is rotated to mesh the threads.

Tests have demonstrated that the members 10 and 12 will not unscrew when the rod is rotated in a reverse direction and a wrench operated with considerable power is required to break a joint; however the members are coupled and uncoupled by a quarter of a rotation. Owing to the use of mutilated threads it is not necessary to give as much taper as where a continuous thread is employed.

I have shown the box formed with a reduced portion 24 having an annular shoulder 24′ at its bottom. This portion forms a mandrel for a guide sleeve 25 which snugly fits the same and rests upon the shoulder. The sleeve may extend to the shoulder 22 of the member and thus be held against rotation or it may terminate short of said shoulder and be free to rotate. The sleeve is provided with helical guide ribs or vanes 26 on its outer surface for spacing the joint from the walls of the tubing. As the guide forms the subject matter of a separate application filed of even date herewith, no claim to the said guide is herein made and the joint may be made without said guide.

It will be seen that when the members 10 and 12 are coupled the wrench faces 13, as before mentioned, will stand in approximately the same vertical plane. When the pin member is given a quarter turn to unmesh the threads so that the pin can be lifted from the box, the upper wrench face will be at substantially right angles to the lower face, thus indicating the uncoupling position. The wrench faces may thus be used as indicators for the coupled and uncoupled positions.

Various changes in the size and shape of the different parts, as well as modifications and alterations may be made within the scope of the appended claim.

What I claim is:

In a joint for pump rods, a solid pin for a box, said pin having longitudinal thread panels on diametrically opposite sides, and shoes extending radially outward from the axis at the bottom of the pin and having inclined faces on their under sides, the threads being disposed at the pitch of said shoes and terminating short of the shoes.

In testimony whereof I affix my signature.

ROBERT A. WILSON.