C. L. PARKER.

PUMP ROD COUPLING.

APPLICATION FILED NOV. 15, 1911.

1,059,560. Patented Apr. 22, 1913.

Fig. 1.

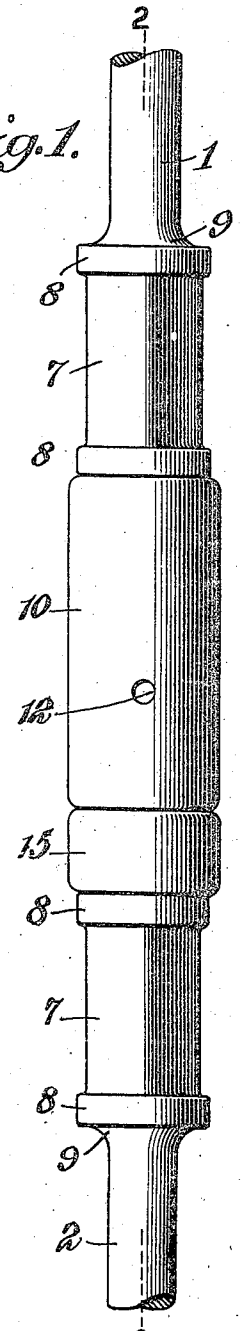


Fig. 3.

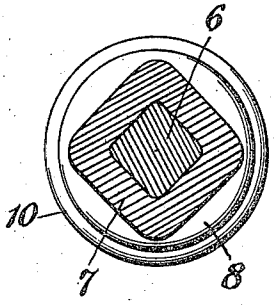


Fig. 4.

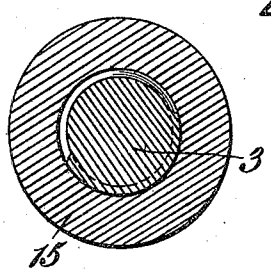
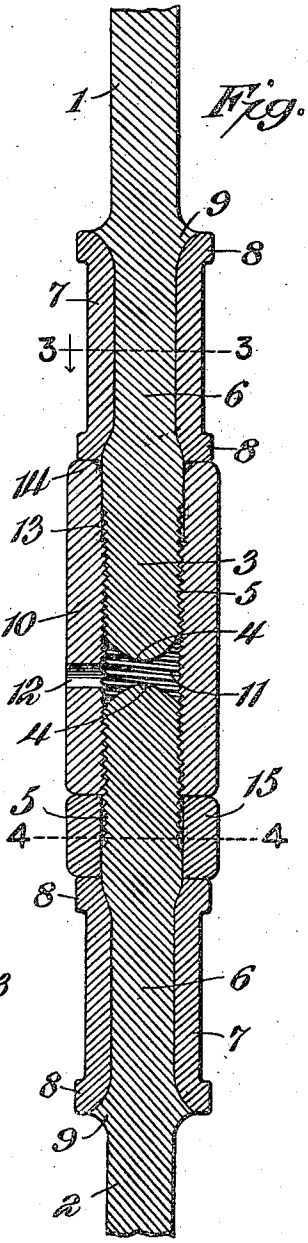


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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PUMP-ROD COUPLING.

1,059,560. Specification of Letters Patent. Patented Apr. 22, 1913.

Application filed November 15, 1911. Serial No. 660,461.

To all whom it may concern:

Be it known that I, CLARENCE L. PARKER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Pump-Rod Coupling, of which the following is a specification.

This invention has reference to improvements in pump rod couplings, and is designed more especially for use in connection with pump rods for deep wells.

It is customary to couple the sections of pump rod, usually about twenty feet, more or less, in length, by means of straight coupling sleeves internally threaded to receive the threaded ends of the pump rod sections. These sleeves will at times work loose and are always subject to wear, oftentimes more on one side than the other, by engagement with the duct through which the rod extends, and the rods are often many hundreds of feet in length, wherefore each complete pump rod comprises many sections and many couplings. When a pump rod is inserted in the well it is the customary practice to couple three sections of rod together and then insert the three coupled sections at one time into the well. Such a group of coupled sections is about sixty feet in length, and more or less limber and difficult to handle. The result is that the attempt to insert the threaded end of the group of rod sections into the coupling already fast to the portion of the pump rod introduced into the well causes the threads to jam, wherefore great difficulty is experienced in properly uniting portions of the pump rod outside the well with the portions within the well.

It is the object of the present invention to provide a pump rod coupling which will withstand wear for long periods of time and in which the worn parts may be very readily renewed at small cost while the uniting of the sections of the pump rod is greatly facilitated even though the attempt be made to screw three or more coupled sections exterior to the well into the sections of the pump rod already lodged in the well. For this purpose the threaded ends of the pump rod sections are enlarged or upset before threading and adjacent the upset portion there is applied a sleeve then secured to the rod by upsetting a portion of the metal of the latter against that end of the sleeve remote from the threaded end of the rod. Such sleeve is made of polygonal cross section exteriorly for the application of a wrench or like tool and has a non-circular bore, the rod being similarly shaped so that the sleeve will not turn on the rod when the latter is being screwed into place. There is also provided a straight interiorly threaded coupling, one end of which is counter-sunk to the depth of threads for an appropriate distance to guide the threaded end of the rod section into the sleeve before the threads catch, thus automatically centering the rod irrespective of the fact that the section to be screwed on to the rod already in the well may be out of line therewith.

That end of the coupling sleeve which is first applied to a rod section need not be provided with any counterbore, for there is no difficulty in applying the sleeve to the rod, but between the said end of the coupling sleeve and the corresponding sleeve already fast upon the rod for the application of a wrench, there is applied a collar or ring of metal much harder than the coupling sleeve, which ring of metal serves as a wearing ring protecting the coupling sleeve from undue wear and which may be turned from time to time should, as very frequently occurs, the wear be largely on one side only of the ring.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification, with the understanding that while the drawings show a practical embodiment of the invention the latter is by no means limited to any exact conformity with the showing of the drawings but may be variously changed and modified so long as the salient features of the invention are retained and the result sought is obtained.

In the drawings:—Figure 1 is an elevation of a pump rod coupling with adjacent portions of the coupled ends of two pump rod sections. Fig. 2 is a longitudinal diametric section of the structure shown in Fig. 1. Fig. 3 is a cross section on the line 3—3 of Fig. 2. Fig. 4 is a cross section on the line 4—4 of Fig. 2.

Referring to the drawings there are shown two pump rod sections 1, 2, respectively, the drawing including only one end of each section, but it will be understood that these sections are each alike at both ends and are usually about twenty feet in

length. The ends of each section are upset or enlarged, as shown at 3, and the terminal portions are rounded, as indicated at 4, while throughout the greater portion of the enlarged part 3 of the end of each pump rod section there are external screw threads 5.

Adjacent the enlarged section 3 there is a squared portion 6 of the pump rod, although it will be understood that it is not necessary that the cross section of this portion of the pump rod section be square, for other non-circular shapes will answer. Applied to the portion 6 of the pump rod section is a sleeve 7 having terminal outstanding flanges 8. The bore of each sleeve 7 conforms in shape to the cross sectional shape of the portion 6 of the rod, while between the flanges 8 the exterior of the sleeve 7 is made square or other polygonal shape for the application of a wrench or other suitable tool, whereby the pump rod section may be turned about its longitudinal axis. The sleeve 7 at one end abuts against the enlarged portion 3 of the end of the pump rod, while the other end of the sleeve is engaged by an expanded portion 9 of the pump rod, which expanded portion may be produced by upstanding the metal of the pump rod against the metal of the sleeve, both ends of the bore of the sleeve being usually flared out for the purpose.

To connect the adjacent threaded ends of two pump rod sections there is provided a coupling sleeve 10 with interior screw threads 11 and at an intermediate point a hole or perforation 12. The coupling 10 may be in the form of a straight coupling similar to those commonly employed for connecting pump rods, but in the present instance the coupling 10 differs from ordinary couplings in having one end axially counterbored, as indicated at 13 for an appropriate distance and to about the base of the threads 11. The extreme end of the counterbore portion of the coupling sleeve is rounded as indicated at 14, whereby the rounded end 4 of the pump rod section introduced into this sleeve will find ready entrance thereto and is guided in substantial alinement with the bore of the sleeve by the counterbored portion 13 which is free from screw threads and of a diameter closely approaching the external diameter of the threads 5, so that the rod on reaching the screw threads 11 is in position to take into these screw threads without jamming, thus greatly facilitating the coupling of a long, limber and tremulous portion of pump rod to another portion of the pump rod already in the well.

The relation between the threaded ends 3 of the pump rod sections and the coupling sleeve 10 is such that there will remain a space between the sleeve 7 on the pump rod section to which the coupling is first applied and the corresponding end of the coupling when the said coupling is screwed on to the pump rod section to the full intended extent, and surrounding the pump rod section in such space there is a ring 15 which may be of less length than the coupling 10 and is made of specially hardened metal.

For reasons which need not be entered into here, the coupling 10 is made of comparatively soft metal, so as to be tough and free from brittleness, wherefore it will stand the strains put upon it without breakage. The ring or collar 15 is not subjected to such strains and is, therefore, made very hard to withstand wear, the said ring or collar 15 being designed to withstand wear so that it will protect the coupling 10 from the wear to which the coupling is subjected in the absence of the ring or collar 15. While the presence of the ring or collar 15 greatly reduces the wearing away of the coupling there is still some wear and after an appropriate time the coupling may be loosened sufficiently to turn the ring or collar 15 to present a new surface to that portion of the coupling subjected to wear and the coupling sleeve 10 is therefore protected for a correspondingly longer period which may be still further prolonged by again turning the collar 15 to present a still unworn surface. By this means the coupling sleeve 10 is protected from wear for long periods of time and after the hardened collar 15 has served its purpose a new collar may be applied at a practically negligible expense.

When the pump rod is being introduced into the well a number of pump rod sections, usually three, are coupled together on the ground and are then lifted to an upright position and the then lower end of the coupled sections is applied to that portion of the pump rod already within the well and is screwed thereto. The portion of the pump rod in the well may be typefied by the section 2 in the drawings, to which section there is already applied the coupling sleeve 10 with the collar 15 lodged between the corresponding ends of the sleeves 7 and 10 then carried by the rod 2. The rod 1 shown in the drawings may typify the group of sections coupled together and about to be connected to the rod 2 by the coupling sleeve 10. The difficulty of screwing so unstable a device as sixty or more feet of pliable pump rod to a coupling sleeve but a few inches in length, when the interior threads of the sleeve extend to the then upper end thereof, is at once apparent and this difficulty has been experienced for a long time by those engaged in the installation of pump rods in deep wells, such as oil wells and the like, the mere act of coupling the rods sometimes requiring the services of several men and the expenditure of great energy. With the present invention the lower end of the connected sec-

tions of pump rod about to be screwed into a coupling 10 is introduced into the counter bore 13 and is thereby guided into practical alinement with the longitudinal axis of the sleeve 10, so that when the threads 5 are brought into engagement with the threads 11 the threads 5 take into the threads 11 without difficulty and without any liability whatsoever of jamming, wherefore the parts are screwed together with ease and without injury. The passage 12 permits the escape of air and any material which may find lodgment in the sleeve 10.

To turn the collar 15 requires simply the loosening of the coupling sleeve from the corresponding section 2, after which the parts may be again screwed together tightly, locking the collar 15 in the new position, and this operation may be repeated a number of times before the collar 15 becomes sufficiently worn to render it useless. The collars 15 may be very cheaply produced and thereby save replacing the far more expensive couplings.

The sleeves 7 protect the pump rod from injury due to the use of wrenches or other means employed to tighten or loosen the pump rods in the couplings.

What is claimed is:—

1. In a pump rod coupling, a coupling member of comparatively soft, tough material shaped for joining the contiguous ends of pump rod sections, and a ring or collar on the pump rod at one end of the coupling member and of a material more resistant to wear than the coupling member and of a diameter and length to present an exterior wearing surface protective of the outer surface of said coupling member.

2. A pump rod coupling comprising a coupling sleeve for receiving the contiguous ends of pump rod sections, and a ring or collar of harder material than the coupling sleeve and held to said sleeve by the coupling rod entering the corresponding end of the sleeve, said collar being of a diameter and length to present an exterior wearing surface protective of the outer surface of the coupling member.

3. Pump rod sections having near the ends designed to be coupled together surrounding sleeves for the application of a manipulating tool, the ends of the sections beyond the said sleeves being screw threaded, an internally threaded coupling sleeve adapted to receive the threaded ends of the rod sections, and a ring or collar confined between the coupling sleeve and an adjacent sleeve on a rod section designed to receive a manipulating tool, said ring or collar being of greater wear resisting qualities than the coupling sleeve.

4. Pump rod sections each having the ends designed to be joined together screw threaded and adjacent the screw threaded ends provided with sleeves having the exterior walls formed to receive a manipulating tool, the interior walls of the sleeves and the portions of the pump rod sections passing therethrough being of non-circular cross section, a coupling sleeve adapted to receive the screw threaded ends of the pump rod, one end of the coupling sleeve being counterbored to a diameter substantially that of the basic portions of the threads, and a wear resisting collar or ring adapted to be confined between that end of the coupling sleeve remote from the counterbore end and the adjacent sleeve adapted to receive a manipulating tool when the parts are in coupled relation.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CLARENCE L. PARKER.

Witnesses:

JOSEPH STREETON,

ARTHUR L. EUSTIS.