

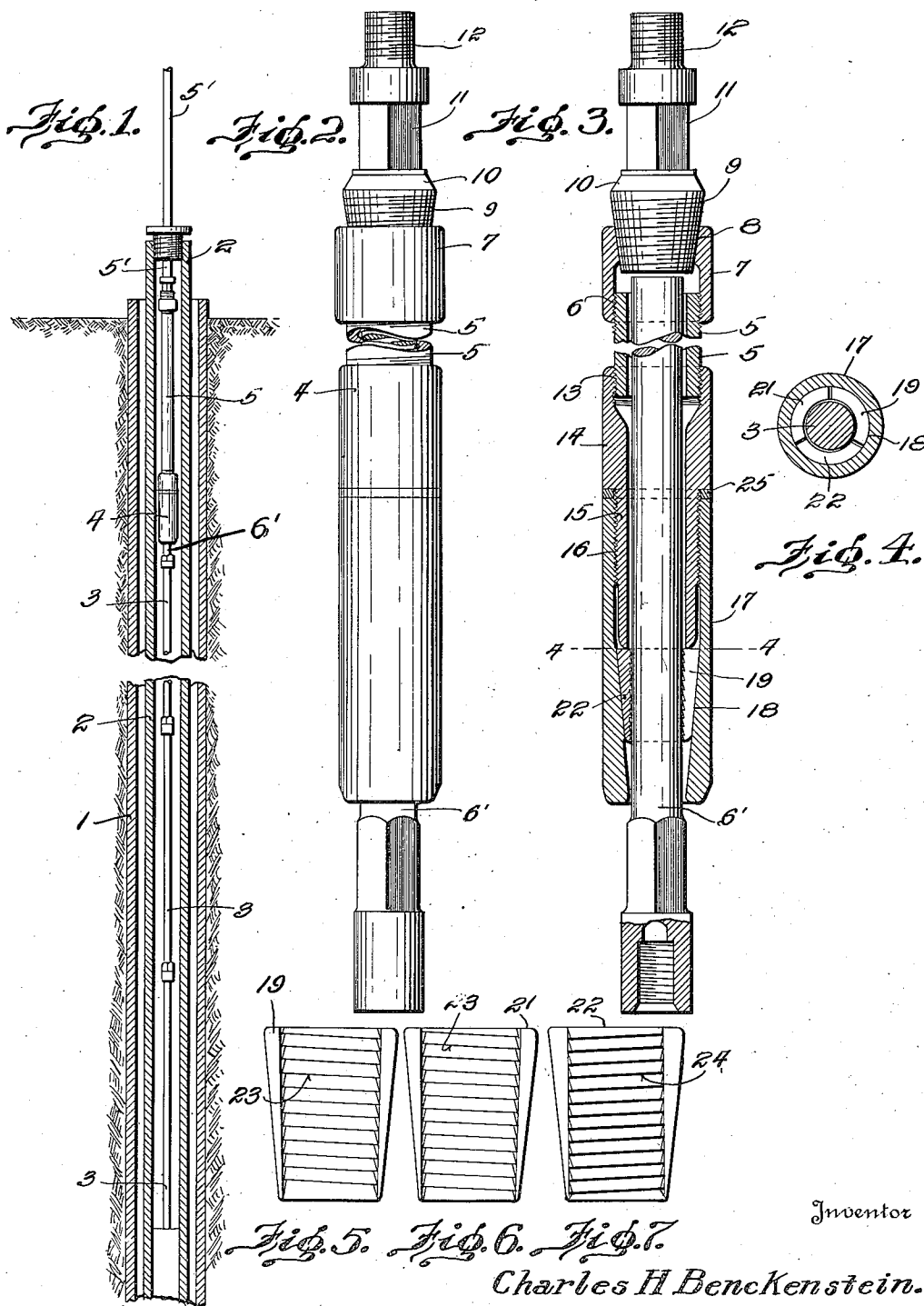
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ROD SPACER FOR OIL WELLS

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UNITED STATES PATENT OFFICE.

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ROD SPACER FOR OIL WELLS.

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To all whom it may concern:

Be it known that I, CHARLES H. BENCKENSTEIN, citizen of the United States, residing at Vinton, in the parish of Calcasieu and State of Louisiana, have invented certain new and useful Improvements in Rod Spacers for Oil Wells, of which the following is a specification.

My invention relates to means for adjusting the length of rods, particularly of adjusting the length of sucker or pump rods used in oil wells.

An object is to devise a structure that will enable sucker or pump rods to be adjusted without cutting any rod section and that will at the same time permit the adjustment to be any desired fractional part of the length of one of the sections, that is, one of the sucker or pump rod sections which are approximately twenty-five (25) feet in length.

Another object is to devise a rod spacer which will not only permit the adjustment of the length of the sucker or pump rod, but, which, when once adjusted, will securely lock the parts against any danger of slipping.

A still further object of my invention is to devise a structure to accomplish the above outlined objects which will be simple, cheap to manufacture and easy to repair.

Formerly, when pumping oil, or water, or other liquids from wells, difficulty was experienced in obtaining a sucker or pump rod of exactly the right length to successfully operate the traveling valve located at the lower ends of the rod in the tubing or casing with the pump structure located at the upper end of the rod. The adjustment of the length of the sucker or pump rod has to be such that the pumping structure, consisting of a piston—traveling valve—with cups thereon sliding within a smooth cylinder or working barrel, shall be at the proper position within the working barrel relative to the oil or water to be pumped. Hitherto the adjustment of the length of the sucker or pump rod, which comprises many sections of approximately twenty-five (25) feet length (iron rods), or approximately thirty (30) feet length (wooden rods), held together by screw couplings, was done by cutting one of the twenty-five or thirty feet sections to the proper length and, if an iron rod, welding the cut ends together, or, if a

wooden rod, restrapping the rod. Whenever the depth of the oil in the well changed or whenever the apparatus was placed within a new well, or when the rods part or break and new rods are substituted of a different length, the adjustment of the length of the pump rod was again affected. This necessitated the waste of one of the pump rod sections for each new adjustment, and, moreover, entailed great loss of time and labor. It is to overcome the difficulties above outlined that I have devised my structure.

My invention comprises a rod spacer mechanism having a nesting member to which is fastened a top head through which the steel rod section of the invention is adapted to pass. A bottom head having a tapered-wedging surface is screw threaded to the top head, and wedges, with their smooth side against the wedging surface and their roughened side against the rod, are placed so that when the bottom head is screwed up upon the tophead the ridged surfaces of the wedges will bear against the rod and grip the same. The ridges, bat-wings or corrugations on the wedges are so cut that different wedges will grip the rod against reciprocating motion in both directions. The total gripping power of the wedges is so adjusted that the greatest gripping will be in the direction of the greatest strain, which in an oil or water well pumping structure is in the direction of the force of gravity because of the great weight of the rod and oil.

With these and other objects in view which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements comprising my invention, may be varied in construction, proportions and arrangement, without departing from the spirit and scope of the appended claims.

In order to make my invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect, without limiting the improvements in their useful applications to the particular constructions, which, for the purpose of explanation, have been made the subject of illustration.

In the drawings:

Figure 1 illustrates a cross-sectional view of an oil or water well showing the tubing

and the position of my pump or sucker rod spacer mechanism relative to the sections of the sucker or pump rod.

Figure 2 shows a side elevation of an enlargement of my rod spacer mechanism with a portion of the tubular nesting member broken away.

Figure 3 is a longitudinal cross-sectional view through the axis of my rod spacer mechanism.

Figure 4 is a cross-section taken on the lines 4—4 of Figure 3.

Figures 5 and 6 are details of the ridged wedges that grip in the upward direction.

Figure 7 is a detail of the ridged wedge that is adapted to grip in the downward direction.

Referring to the drawings: In Figure 1 there is shown a portion of an oil well having an exterior tubular casing 1 and an interior tubular casing 2. Within the interior tubular casing is adapted to reciprocate a pump rod formed of sections 3 held together by screw threading or any other suitable means. At the top of the well is shown my rod spacer mechanism 4 and screw threaded to the rod spacer mechanism 4 is the polish rod 5' that reciprocates through an opening in the top of the casing 2.

The rod spacer mechanism 4 comprises a tubular nesting member 5 through which a rod 6'—the adjusting rod—is adapted to pass. The tubular nesting member 5 is of the approximate length of one of the sucker or pump rod sections 3, and is provided at its top with screw threads 6 which engage with the screw threads upon a cap 7 having a screw threaded aperture 8 at its end. The screw threads at 8 are preferably tapered and adapted to engage with the screw threads 9 on a tapered portion 10 of a coupling member 11. The coupling member 11 is provided at its upper end 12, with screw threads for attachment to the polish rod 5'. At its lower end the tubular nesting member 5 is provided with screw threads 13 for engaging screw threads upon a top head 14 of my invention.

The top head 14 has at its lower end a reduced portion 15 that is screw threaded to adapt it to engage with the screw threads 16 on a bottom head 17. The bottom head 17 is a cylindrical member constructed with a conical tapering wedging surface 18 at its lower end. Tapering arcuate wedges 19, 21 and 22 are adapted to fit with their smooth exterior surfaces against the tapering wedge surface 18 of the bottom head 17.

The wedges 19 and 21 are provided on their interior with ridges 23 so constructed that they will grip the rod 6' to prevent slipping against the force of gravity or greater strain. The wedge 22 is provided with ridges 24 so formed that they prevent slipping of the rod 6' in a direction opposite

to the force of gravity. In my invention I provide in this particular construction three wedges, though a different number may be employed. I have shown that the gripping ridges upon the interior of the wedges are so arranged that there is a larger gripping in the direction of the force of gravity or greater strain than there is in a direction opposite to the force of gravity. The reason for this, as previously explained, lies in the fact that there is greater strain in the direction of the force of gravity than in the opposite direction, because of the great weight of the rod sections and pump, and the pressure of the oil.

There is provided a washer 25 located between the bottom head 17 and the top head 14. The washer 25 is preferably of soft metal so that it may if necessary, be slightly compressed in clamping my spacer mechanism to the rod 6'.

In operation my rod spacer mechanism is attached by the screw threaded portion 12 of the coupling member 11 to the polish rod 5'. Any suitable adjustment of the length of the rod within the fractional portion of the length of one of the rod sections may be obtained. This is done by slipping the rod section 6' to any desired position within the tubular nesting member 5. The top head 14 has previously been screwed into position on the end of the tubular nesting member 5. The washer 25 has been positioned between the upper head 14 and the lower head 17 and the proper position of the rod 6' in the nesting member 5 having been exactly determined the lower head 17 is screwed onto the upper head 14. As the lower head 17 is turned, the screw threads cause the lower portion 15 of the upper head 14 to protrude further and further towards the bottom of the lower head 17 and to crowd upon the top of the wedges 19, 21 and 22 so that these wedges, by reason of their engagement with the conical wedging surface 18, will be firmly pressed into the rod 6' and hold it against slipping either in the direction of the force of gravity or contra thereto.

By my invention I have enabled the adjustment of the pumping apparatus of oil wells to be quickly effected without the operation of cutting one of the rod sections to the desired length and welding the apparatus together if iron, or restrapping together if wooden. Thus, not only have I effected a saving of time in adjustment, but I have devised a structure which will hold the rod section in a much firmer manner than has hitherto been accomplished by welding two ends of a rod cut to length if iron, or restrapping if wooden, since welded or restrapped rods often break under longitudinal strains.

While I have shown and described the preferred embodiment of my invention, I wish

it to be understood that I do not confine myself to the precise details of construction herein set forth, by way of illustration, as it is apparent that many modifications and variations may be made therein, by those skilled in the art, without departing from the spirit of the invention, or exceeding the scope of the appended claims.

I claim as my invention:

1. A rod spacer mechanism comprising an individual nesting member, a tubular top head fastened thereto and through which a rod is adapted to pass, a tubular bottom head and means coacting with the top and bottom head to grip the rod.

2. A rod spacer mechanism comprising an individual nesting member, a tubular top head fastened thereto and through which a rod is adapted to pass, a tubular bottom head screw threaded to the top head and means coacting with the top head and bottom head by reason of their screw threaded engagement to grip the rod.

3. A rod spacer mechanism comprising an individual nesting member, a tubular top head fastened thereto and through which the rod is adapted to pass, a tubular bottom head screw threaded to the top head, wedges having ridges thereon, different wedges being adapted to grip the rod in opposite directions positioned between the top and bottom heads to grip the rod.

4. A rod spacer mechanism comprising an individual nesting member, a tubular top head fastened thereto, a tubular bottom head having a tapered conical wedging surface, ridged wedges having their smooth side against said wedging surface and their roughened side against the rod to grip the rod.

5. A rod spacer mechanism comprising an individual nesting member, a tubular top head fastened thereto, a tubular bottom head screw threaded to the top head, a washer of relatively soft metal between the top and bottom head and means coacting with the top and bottom heads by means of their screw threaded engagement to grip the rod.

6. A rod spacer mechanism comprising an individual nesting member, a tubular top

head fastened thereto through which the rod is adapted to pass, a tubular bottom head having a tapered wedging surface, ridged wedges having their smooth side against said wedging surface and their roughened side against the rod to grip the rod and a washer of relatively soft metal between the top and bottom head.

7. A rod spacer mechanism comprising an individual tubular nesting member, a tubular top head fastened thereto, a tubular bottom head having a tapered conical wedging surface, ridged wedges having their smooth side against said wedging surface and their roughened side against the rod to grip the rod and a washer of relatively soft metal between the top and bottom head.

8. A rod spacer mechanism comprising a nesting member, a top head fastened thereto and through which the rod is adapted to pass, a bottom head screw threaded to the top head, wedges fastened between the top and bottom head having ridges thereon, different wedges being adapted to grip the rod in opposite directions, the greater total gripping being in the direction of greater strain.

9. A rod spacer mechanism comprising a casing member, a top head fastened thereto and through which the rod is adapted to pass, a bottom head having a tapered wedging surface and screw threaded to the top head, wedges having ridges thereon, different wedges being adapted to grip the rod in opposite directions, the greater total gripping being in the direction of the greater strain.

10. A rod spacer mechanism comprising a tubular nesting member, a top head fastened thereto and through which the rod is adapted to pass, a bottom head having a tapered wedging surface screw threaded to the top head, wedges having ridges thereon, different wedges being adapted to grip the rod in opposite directions, the greater total gripping being in the direction of greater strain and a washer of relatively soft metal between the top and bottom heads.

In testimony whereof I affix my signature.

CHARLES H. BENCKENSTEIN.