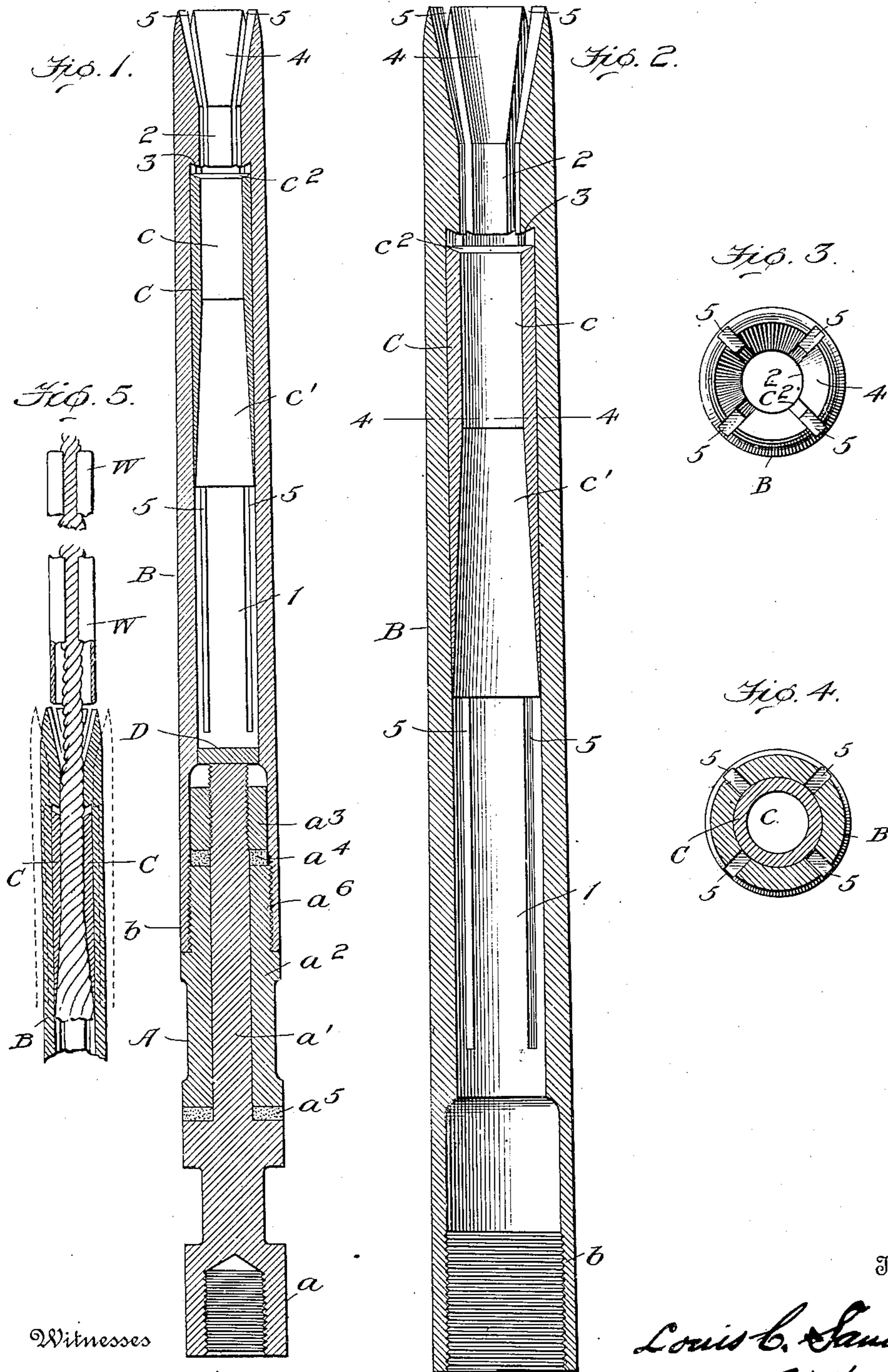


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 SWIVEL ROPE SOCKET FOR WIRE LINE PUMPING OUTFITS.
 APPLICATION FILED NOV. 23, 1909.

982,998.

Patented Jan. 31, 1911.



Witnesses

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LOUIS C. SANDS, OF PITTSBURG, PENNSYLVANIA.

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Specification of Letters Patent.

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Application filed November 23, 1909. Serial No. 529,635.

To all whom it may concern:

Be it known that I, LOUIS C. SANDS, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Swivel Rope-Sockets for Wire-Line Pumping Outfits; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the construction of that class of devices commonly termed swivel rope sockets employed for connecting a wire pumping line with the working valves in pumping oil, and Artesian wells, and has for its object the provision of a swivel socket of a character which will permit of the ready detachment of the pumping line from the working valve at the will of the operator, while the parts are in the well, and when for any reason it is impossible or not desirable to pull the valve independently of the barrel and tubing.

As at present constructed, the connections between the wire line and swivel of a wire line pumping outfit are of such a character that said parts can not be disconnected when in the well, but must be withdrawn therefrom for such purpose, which leads to loss of both time and material when it becomes necessary to draw the well tubing to get at the pump valves. In pumping oil wells it frequently happens that a large amount of sand is entrained in the oil, and this causes little or no trouble while the pumping operation is continued as the sand readily deposits in the tanks into which the oil is pumped, but in case the pumping of the well is suspended for any length of time the sand contained in the column of oil remaining in the tubing settles to the bottom, is deposited on the valves, and owing to its peculiar character may cement the working valve of the pump to the barrel so as to render it impossible to either pump the well or pull the valve out of the barrel and up through the tubing for the purpose of replacing the valve. Under these conditions it becomes necessary to pull the tubing, and in doing this the wire pumping line must be threaded through the sections of tubing as each section is removed from the string, which is very laborious and causes a great loss of

time; or the wire pumping line must be cut as each section of tubing is removed which results in a slight loss of time and a total loss of the wire pumping line. The presence of the sand in the oil being pumped, and the absence of lubricating properties in the oil, gives rise to great wear on the swivel which shortens the life of the swivel, unless the sand, &c., is prevented from entering the swivel through the socket.

To overcome the first of the above noted objections and obtain a ready means for detaching the pumping line from the swivel, I provide the swivel with an expansible socket for the reception of the thimble or rope-ferrule of the pumping line, the bore of said expansible socket having on its interior means for confining the thimble or rope-ferrule within the socket, said bore at its outer end being of greater diameter than the pumping line with which the socket is used, for the reception of a drop-weight whereby the socket is expanded to release the pumping line, and such a construction embodies the main feature of my invention.

To overcome the second of the above noted objections and to protect the swivel from sand, &c., I close the lower end of the bore of the expansible socket by means of a disk or its equivalent, and such a construction embodies a secondary feature of my invention.

There are other, minor, features of invention, residing in particular combinations and elemental features of construction, all as will hereinafter more fully appear.

In the drawings chosen for the purpose of illustrating my invention the scope of which will be pointed out in the claims, Figure 1 is a longitudinal central section of a swivel and expansible socket embodying my invention. Fig. 2 is an enlarged sectional view of the expansible socket detached from the swivel. Fig. 3 is an end view of the socket showing the funnel shaped mouth or inwardly tapering bore of the upper end of the socket. Fig. 4 is a transverse section of the expansible socket and the included thimble or rope-ferrule for the lower end of the pumping line. Fig. 5 is a detail sectional view of the upper end of the expansible socket and the lower end of a drop-weight for expanding the socket.

Like symbols refer to like parts wherever they occur.

I will now proceed to describe my inven-

tion more fully so that others skilled in the art to which it appertains may apply the same.

In the drawings, A indicates the swivel member, B the socket member, C the rope-ferrule or thimble for the wire line of a pumping outfit, and D a disk for closing the lower end of the bore of socket B to prevent the passage of sand, &c., from the socket into the swivel.

The swivel member A may be of any suitable construction. In the present instance it consists of the box member a for the reception of the pin member of a sinker which is interposed between the working valve and the swivel, or for a pin member on the cage of the working valve as the case may be. On the stem a' of the box member a is journaled a rotating sleeve member a^2 which is secured to the box member by a nut a^3 on the threaded upper end of the stem a' and said rotating sleeve member a^2 is provided at its ends with packings a^4 , a^5 , for the protection of the swivel from sand and grit. The upper end of the rotary sleeve member a^2 is threaded as at a^6 for the reception of the box b on the lower end of the socket member B.

The socket member B which is to be expandible to permit of the escape therefrom of the thimble or ferrule on the lower end of the pumping line, is preferably of tubular form having a straight bore 1 slightly exceeding in diameter the external diameter of the rope-ferrule or thimble C, a lesser bore 2 external thereto of diameter slightly exceeding that of the wire pumping line, thus forming a projecting shoulder 3 for confining the thimble C within the bore 1 of the socket, and a funnel shaped or flaring mouth as at 4 for a purpose which will hereinafter appear. This tubular socket B is slotted longitudinally as at 5, 5 from its upper end downward for a sufficient distance to permit such an expansion of the socket as will allow of the escape from the socket of the rope-ferrule or thimble C of the wire pumping line. The socket is preferably quadrifid or composed of four segments, but may be otherwise slotted if desired.

It will be noted that, considering the bore of the socket as a whole, its outer end or mouth has a diameter which sufficiently exceeds that of the wire pumping line with which the socket is to be used as will afford entrance for a drop-weight by means of which the socket may be expanded to release the thimble or rope-ferrule on the end of a pumping line.

The rope-ferrule or thimble C is of a character commonly used for providing a solid holding end for wire rope or wire lines, that is to say it has a straight bore c corresponding in diameter to the diameter of the wire rope or wire line to the end of which it is to be applied, and an outwardly flaring or tapering bore c' to permit of the expansion and wedging of the end of the wire rope or wire line to confine the rope-ferrule or thimble thereon.

The outer diameter of the rope-ferrule or thimble C will correspond with the inner diameter of the socket B at the portion 1 of the bore and will be received in said portion 1 of the bore so that while the wire line will pass through the constricted portion 2 of the bore, the upper end of the rope-ferrule or thimble C will engage the shoulder 3 and thus be retained within the bore of socket B. If desired, the shoulder 3 may be undercut as indicated in the drawing, and the upper edge of the rope ferrule or thimble C beveled out as at c^2 to take under the shoulder in such manner as to confine the slotted portion of the socket and prevent accidental expansion thereof during the pumping operation.

In order to prevent any entrance of oil and sand or water and sand from slotted socket B into the swivel A, I insert a disk D into the lower end of the bore 1 of the socket, and said disk is preferably of brass and is driven into place with sufficient force to insure a tight joint.

The construction being such as hereinbefore pointed out, the devices will be assembled and will operate as follows: The swivel A is secured to the sinker and cage of the working valve. The disk D having been first forced into the lower end of the bore of the socket-member B, said socket-member is secured to the swivel member A in the usual way. The rope-ferrule or thimble C is then attached in the usual manner to the end of a suitable wire pumping line, after which the ferrule or thimble is forced through the flaring portion 4 of the socket into bore 1 of said socket until the upper edge of the rope-ferrule or thimble C takes under and engages the shoulder 3 in the bore of the socket which will prevent the disengagement of the wire pumping line and socket during the pumping operation. When it is desired, for any reason, to disengage the wire pumping line from the socket and to withdraw the pumping line from the tubing, an annular weight W having a tapering or conoidal end, or an end adapted to enter the mouth of the bore of the socket, is threaded on the wire pumping line and dropped through the tubing into the split, flaring open end of the socket B, which will cause the expansion of the segments of the socket until the increased diameter of the bore of the socket at 2 will permit the passage of the rope-ferrule or thimble C, whereupon the disengaged wire line can be withdrawn from the socket together with the attached thimble or ferrule, and the said parts together with the weight which has effected the expansion of the socket can be withdrawn from the tubing.

Having thus described my invention, what

I claim and desire to secure by Letters Patent is:

1. A swivel rope socket expansible at its upper end and having a bore adapted to receive a rope-ferrule or thimble, means on the interior of said socket for confining the rope-ferrule or thimble within the socket, the outer end or mouth of the bore being of greater diameter than the rope with which the socket is to be used for the reception of a drop-weight whereby the socket may be expanded and the ferrule or thimble released.

2. A swivel rope socket having a bore adapted to receive a rope-ferrule or thimble, said socket being provided on its interior with means to engage and prevent the withdrawal of the rope-ferrule or thimble, said socket being longitudinally slotted to permit the expansion of the upper end of the socket and the release of the ferrule or thimble, and the outer end or mouth of the bore of the socket being of greater diameter than the rope with which the socket is to be used for the reception of a drop-weight whereby the socket may be expanded and the ferrule or thimble released.

3. A swivel rope socket having a bore adapted to receive a rope ferrule or thimble, said bore being provided on its interior with a shoulder to engage and prevent the withdrawal of the ferrule or thimble, said socket

being longitudinally slotted to permit of the expansion of the socket and the release of the ferrule or thimble, and the outer end or mouth of the bore being of greater diameter than the rope with which the socket is to be used for the reception of a drop-weight whereby the socket may be expanded and the ferrule or thimble released.

4. A swivel rope-socket for pumping lines, said socket having a bore adapted to receive a rope-ferrule or thimble, means within the socket for confining the ferrule or thimble, said socket having a longitudinally slotted portion which extends below the means which confines the ferrule or thimble, and said bore having a flaring or funnel shaped outer end or mouth for the reception of a drop-weight whereby the socket may be expanded and the ferrule or thimble released.

5. The combination with a swivel member, of a longitudinally slotted tubular expansible rope-socket, and a disk for closing the bore of the rope socket where it connects with the swivel.

In testimony whereof I affix my signature, in presence of two subscribing witnesses.

LOUIS C. SANDS.

Witnesses:

W. W. ANDERSON,

W. H. McKEE.