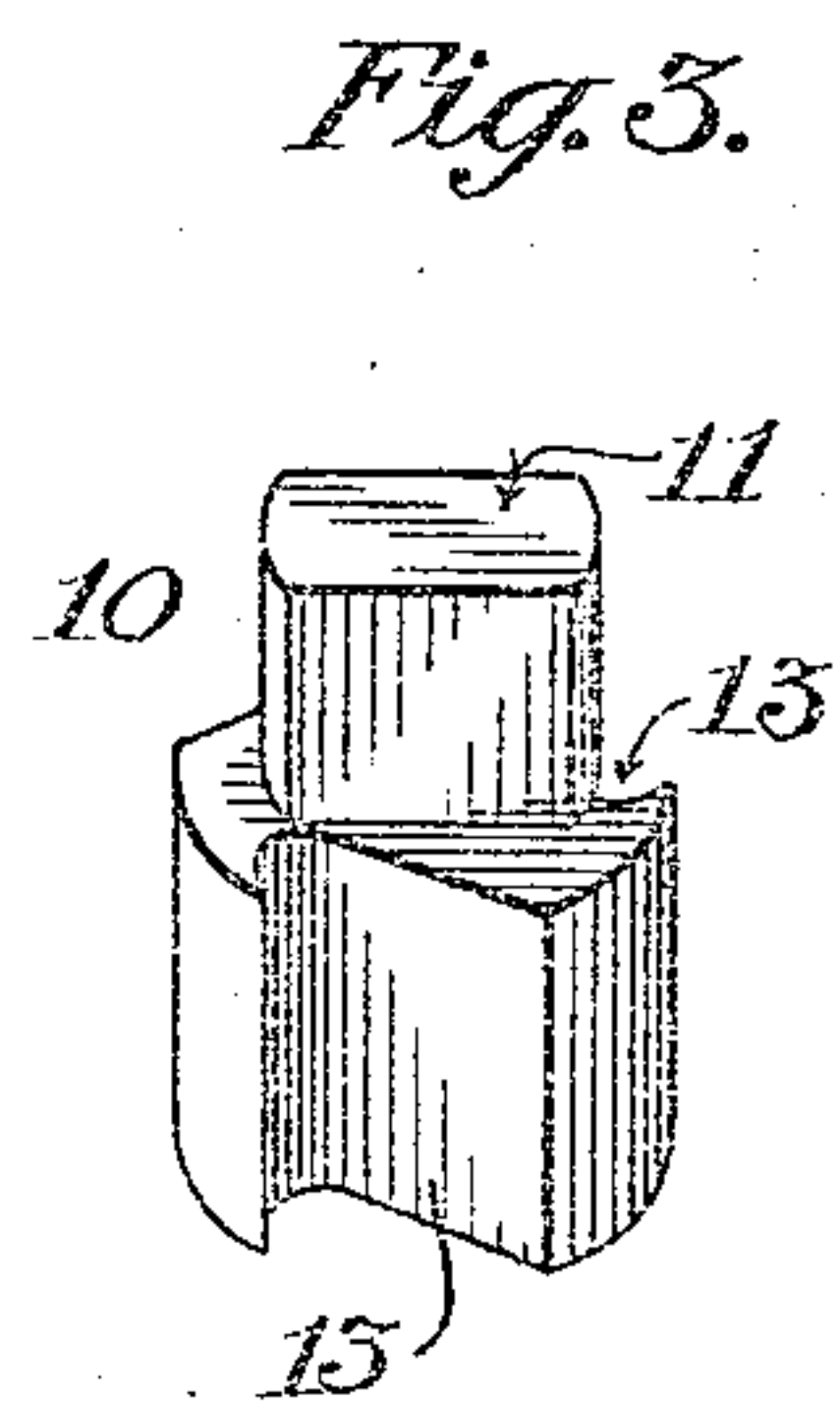
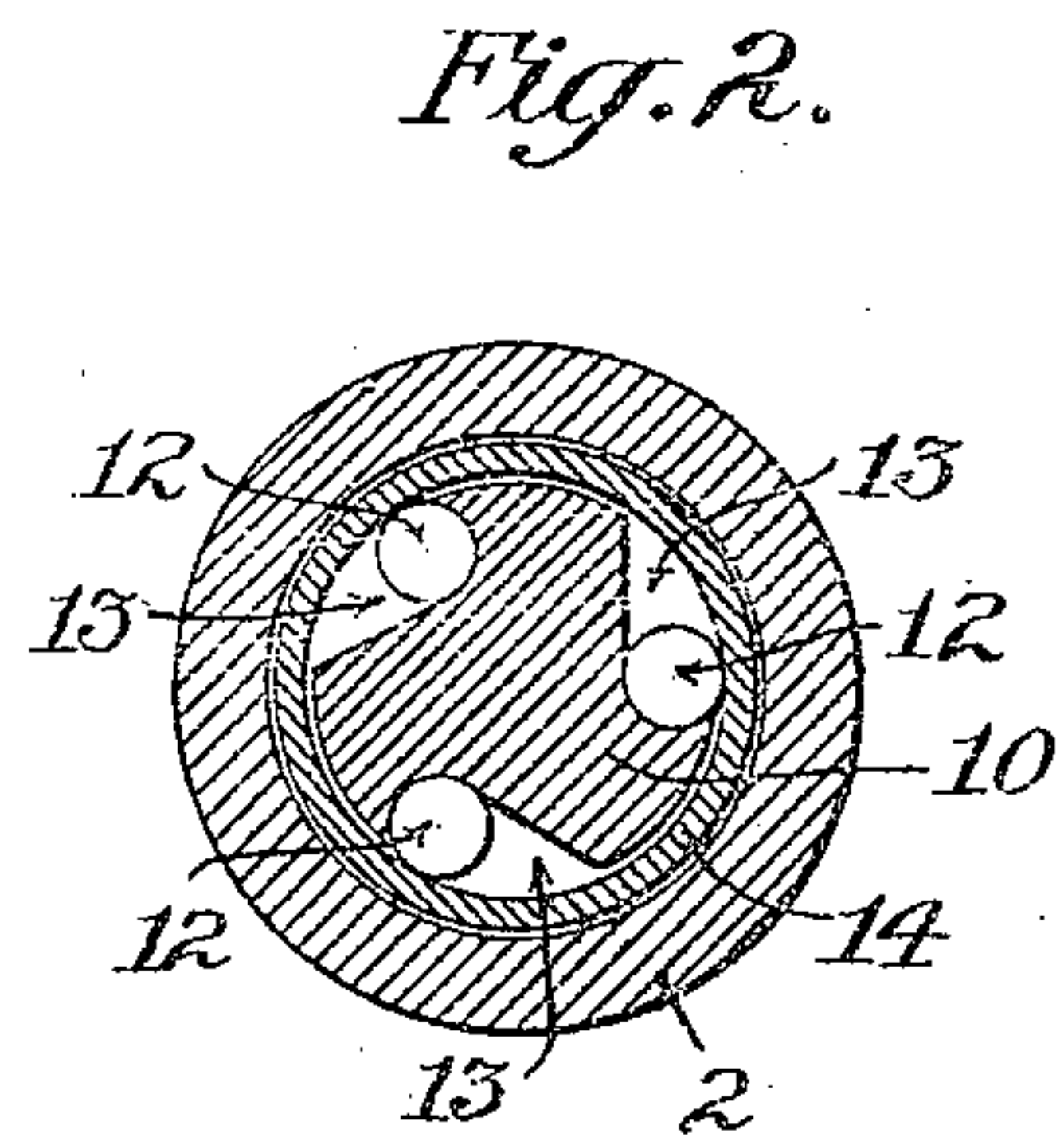
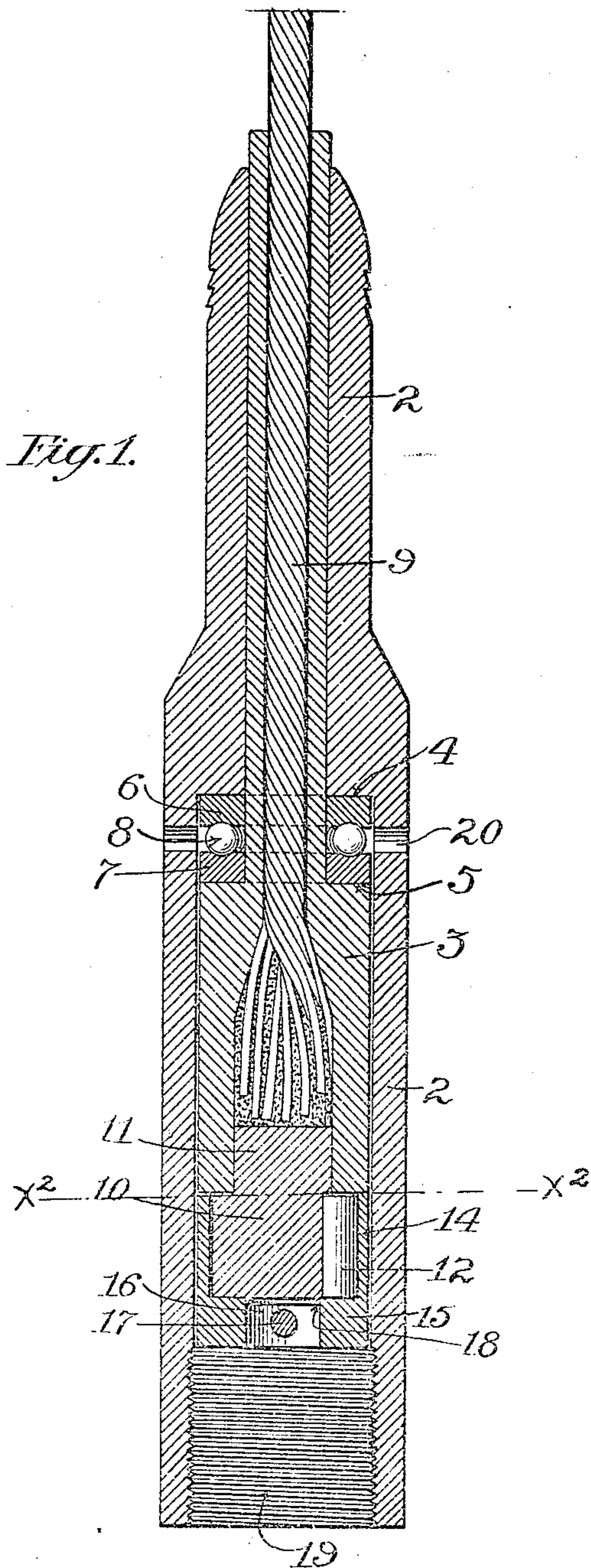


No. 808,199.

PATENTED DEC. 26, 1905.

E. DOUBLE.  
RATCHET SWIVEL ROPE SOCKET.  
APPLICATION FILED JAN. 30, 1905.



Witnesses:  
Frank L. Graham  
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by Townsend Bros  
His attys



# UNITED STATES PATENT OFFICE.

EDWARD DOUBLE, OF LOS ANGELES, CALIFORNIA.

## RATCHET-SWIVEL ROPE-SOCKET.

No. 808,199.

Specification of Letters Patent.

Patented Dec. 26, 1905.

Application filed January 30, 1905. Serial No. 243,233.

*To all whom it may concern:*

Be it known that I, EDWARD DOUBLE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain Improvements in Ratchet-Swivel Rope-Sockets, of which the following is a specification.

This invention relates to ratchet-swivel rope-sockets for well-tools, and is designed to be used in connection with the drilling of oil or Artesian wells, and has for its primary object the provision of a ratchet-swivel rope-socket which shall be extremely simple, cheap, and very durable in construction and positive in operation and in which the wearing parts may be readily removed and replaced.

The invention consists of a swivel-socket having two relatively revoluble parts or members, to one of which the wire rope or cable is connected and to the other of which the drill-tools are connected, a ball-bearing being formed between the two parts, so as to cause the rotation thereof with respect to each other with as little friction as possible, and ratchet means whereby the movement of the parts of the socket with respect to each other are prevented in one direction, while permitting free revolution in the other, such means consisting, essentially, in the provision, in connection with one of said members, of ratchet-ways arranged tangentially with respect to the axis of said member, and ratchet-rollers adapted to work in said ratchet-ways against opposite cylindrical surface stationary with respect to the other member, whereby said members are locked against movement with respect to one direction, though free to revolve in the other.

The invention consists, further, in the constructions and combinations of parts hereinafter described, and particularly set forth in the claims, and will be more readily understood by the accompanying drawings, forming a part of this specification, and in which—

Figure 1 is a longitudinal sectional view of a ratchet-swivel rope-socket embodying my invention. Fig. 2 is a transverse sectional view thereof on the line X<sup>2</sup> X<sup>2</sup> of Fig. 1. Fig. 3 is a perspective view of a removable ratchet-piece carrying the tangential ratchet-ways.

As shown in the drawings, 2 represents the outside member of my ratchet-swivel rope-socket and may be termed the "ratchet proper."

3 represents the inside or swivel member

of the socket. The socket 2 is provided with a longitudinal chamber extending through the neck and increased in diameter to form a shoulder 4. The increased diameter of the chamber of the socket 2 extends throughout the lower portion of the socket, forming a chamber open at both ends, the upper end being of smaller diameter than the lower end. The member 3 is also shouldered, as at 5, to correspond with the shoulder 4 and so spaced as to permit the insertion of the cups 6 7 and balls 8, forming a ball-bearing between the shoulders 4 and 5.

The member 3 is provided with a central perforation or chamber for the reception of the wire rope or cable 9. Toward the lower end of the member 3 the central chamber thereof is expanded so as to permit of a loosening of the strands of the wire cable and the fastening of such cable in the expanded chamber or socket of the member 3 with Babbitt metal in the usual manner.

10 represents the ratchet member, which, as shown, is provided with a shank or stem 11, flattened at its sides to correspond with the shape of the walls of the lower end of the chamber of the member 3, so that while the ratchet member 11 may be readily withdrawn from its socket in the member 3 yet it is held by the walls of said socket from rotary movement therein, no fastening device being necessary, thus avoiding fixing the ratchet member with the member 3, but leaving said ratchet member 10 so that it may be readily withdrawn and replaced, as desired.

12 represents the ratchet-rollers, adapted to work in the ratchet-ways 13 of the member 10. These ratchet-ways 13, as shown, are inclined tangentially to the axis of the member 10 and preferably have curved inner ends. The ratchet-rollers 12 may bear against the inner surface of the member 2; but I prefer to provide an inner cylinder 14, of tool-steel, against which the ratchet-rollers 12 are adapted to bear, making such cylinder 14 readily removable, so as to be readily replaced if the same becomes worn. In the drawings I have shown this cylinder 14 formed integral with the base 15, having a cylindrical chamber 16 therethrough of smaller diameter than the outside diameter of the member 10. Through this base 15 a pin 17 is passed to fix the base 15 and cylinder 14 in fixed relation to the socket 2, thus forming, in effect, an integral portion thereof.



The bottom of the member 10 is preferably provided with an annular flange 18, adapted to fit in the cylindrical chamber 15 so as to center the member 10 in its revolution and prevent any binding thereof.

The socket 2 is provided with a threaded socket 19 for the reception of the pin of the "sub."

20 represents a series of openings through the member 2 into the ball-race, so that any dirt therein may work out.

The operation is as follows: The string of well-tools is connected with the sub in the usual manner, and the pin of this sub is screwed into the threaded socket 19 of the socket proper, 2, and the tools lowered into the well in the usual manner. The weight of the tools on the rope 9 causes the rope to untwist or turn in the direction which would tend to lengthen the same, which causes the locking of the ratchet-rollers 12 between the tangentially-inclined surfaces of the ratchet-ways 13 and the surface of the cylinder 14, thereby causing the two parts 2 and 3 of the rope-socket to be revolved together and carrying the string of tools about with the socket. When the drilling-tools strike the surface to be drilled, at the instant of the impact the weight of the tools is removed from the rope or cable 9, and the rope immediately retwists back to its normal condition. This is rendered possible by the ratchet-rollers 12 rolling inward on the tangentially-inclined surfaces of the ways 13. This operation is repeated at each impact of the tools and the tools caused to revolve slightly in the well, insuring the drilling of a straight round hole.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, in a ratchet-swivel rope-socket, of a socket proper, a revoluble member therein having a rope-receiving socket, a ratchet member loosely connected with said revoluble member to revolve therewith, said ratchet member provided with peripheral ratchet-ways tangentially inclined with respect to the axis of said ratchet member, means at the end of said ratchet member for preventing disengagement of said ratchet

member from said revoluble member, and ratchet-rollers arranged longitudinally in said ways, said socket provided with means for holding a string of well-tools.

2. The combination of a socket proper, a revoluble member therein having a rope-receiving socket, a ratchet member loosely connected therewith to revolve therewith and provided with peripheral ratchet-ways tangentially inclined with respect to its axis, ratchet-rollers arranged longitudinally in said ways, and means fixed within said socket proper and at the lower end of said ratchet member for holding said member in place, said socket provided with means for holding a string of well-tools.

3. The combination, in a ratchet-swivel rope-socket, of a socket proper, a revoluble member therein having a rope-receiving socket, a ratchet member revoluble with said revoluble member, provided with peripheral ratchet-ways tangentially inclined with respect to its axis, ratchet-rollers arranged longitudinally in said ways, and means for centering said ratchet member, said socket provided with means for holding a string of well-tools.

4. The combination, in a ratchet-swivel rope-socket, of a socket proper, a revoluble member therein having a rope-receiving socket, a ratchet member loosely mounted in an extension of said socket in and revoluble with said revoluble member, provided with peripheral ratchet-ways tangentially inclined with respect to its axis, ratchet-rollers arranged longitudinally in said ways, means for removably holding said ratchet member in position and a cylindrical wearing-lining interposed between the outer surfaces of said rollers and the inner surface of said socket proper, said socket provided with means for holding a string of well-tools.

In testimony whereof I have heréunto set my hand, at Los Angeles, California, this 21st day of January, 1905.

EDWARD DOUBLE.

In presence of—

DANIEL J. KOENIGSTEIN,  
A. P. KNIGHT.