P. ARBON.

SWIVEL JAR SOCKET.

APPLICATION FILED MAR. 18, 1920.

1,343,541. Patented June 15, 1920.

FIG. 1.

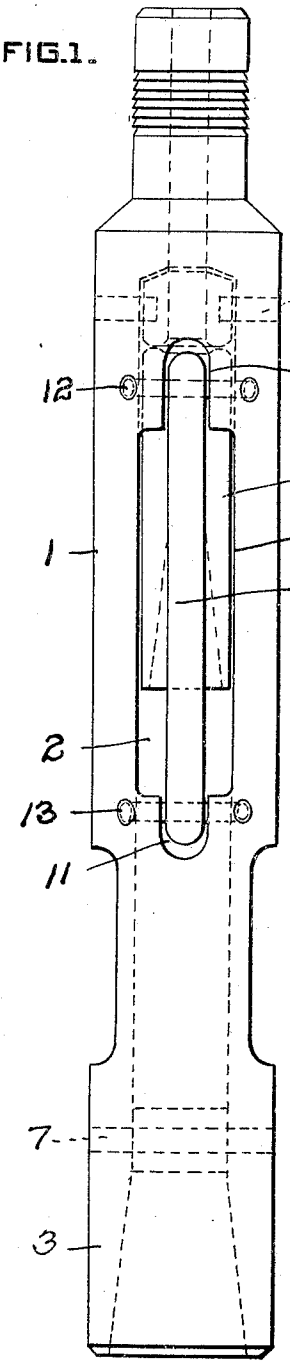


FIG. 2.

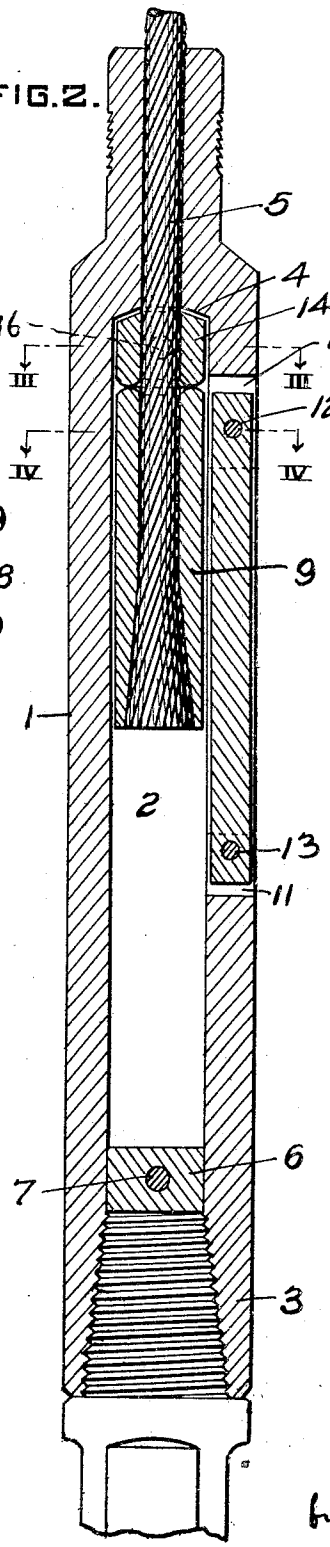


FIG. 3.

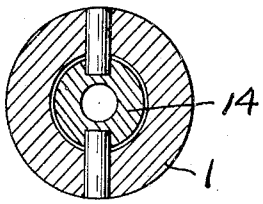
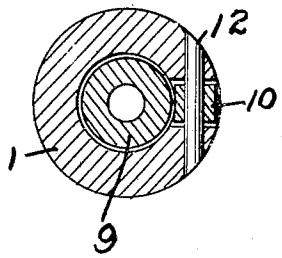


FIG. 4.



WITNESSES

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SWIVEL-JAR SOCKET.

1,343,541. Specification of Letters Patent. **Patented June 15, 1920.**

Application filed March 18, 1920. Serial No. 366,950.

To all whom it may concern:

Be it known that I, PAUL ARBON, residing at Tulsa, in the county of Tulsa and State of Oklahoma, a subject of Great Britain, have invented or discovered certain new and useful Improvements in Swivel-Jar Sockets, of which improvements the following is a specification.

The invention described herein relates to certain improvements in the type of swivel jar socket described and claimed in Letters Patent to Joseph Burns, Nos. 1073469 and 1073470, granted September 16, 1913, and No. 1107889, granted August 18, 1914.

The present invention has for its object a construction of such type of socket wherein the shoulder or abutment through which the blows of the jar or block are transmitted through the socket to the string of tools suspended from the socket, is formed integrally with or in the same body of metal as the internally threaded box which engages the threaded conical pin on the upper end of the stem of the string of tools, the internally threaded box protected from the inflow of sand and water, and the removal of the swivel block or jar through a slot or opening in the side of the socket facilitated. The invention is hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification, Figure 1 is a side elevation of a swivel jar socket embodying the improvements claimed herein; Fig. 2 is a sectional elevation of the same; Figs. 3 and 4 are transverse sections on planes indicated by the lines III—III and IV—IV, Fig. 2.

In the practice of the invention the socket 1 is made with an internal bore or longitudinal opening 2 of substantially uniform diameter from the upper end of the internally threaded box 3 to the shoulder or abutment 4 and from the latter extends a small bore 5 coaxial with the larger bore and of a diameter sufficient to permit freedom of vertical movement therethrough of the rope by which the drilling tools are operated. The internally threaded box 3 is made conical in shape for the reception of the conical externally threaded pin employed in connecting the portions of a string of tools together. This box is entirely cut off from the bore above it by means of a block 6 forming a tight joint with the bore and held in place either by a transverse pin 7 or by shrinking the walls of the socket onto the block.

In the side of the socket is formed a slot or opening 8 of a width a little greater than the diameter of the swivel jar or block 9 and of a length somewhat greater than the said block so that the latter may be easily shifted or passed through the slot into the interior of the socket or removed therefrom. In order to hold the block in position during drilling operations, a retaining bar 10 of a width less than the slot in the wall is secured at its lower and upper ends in notches 11 formed in the wall of the socket at the ends of the slot. It is preferred to secure this bar in place by means of pins 12 and 13 passed through the wall of the socket and holes in the retaining bar adjacent to the ends of the latter. This construction will permit of the withdrawal of the upper pin 12 and the turning of the retaining bar on the lower pin to permit the withdrawal or insertion of the jar or block.

In lieu of allowing the upper end of the jar or block to strike directly against the shoulder or abutment formed at the junction of the large and small bores 2 and 4, it is preferred to employ an annular block 14 having on one end a beveled surface adapted to bear against the shoulder 4 while the opposite end is transversely curved for a purpose hereinafter described. This block, which is preferably made of hard tool steel is held in position in any suitable manner, preferably by means of pins 16 inserted through the wall of the socket and projecting into the bearing or impact block 14. In order to facilitate the removal of the jar or block when connected to the end of a rope, the notch at the upper end of the slot is formed of such a length relative to the length of the bearing block that the rope connected to the jar or swivel may be drawn out through such notch when it is desired to disconnect the swivel from the rope or attach the swivel to a new rope passed down through the socket. In addition to thus facilitating the withdrawal of the block from the socket the proportioning of the length of the notch and the length of the impact block, as above stated, will bring them in line with an opening between the upper end of the retaining bar and the upper end of the notch so that when the swivel jar or block moves up, any sand or water interposed between the contacting surfaces

and the wall of the bore will be forced out through this notch.

It will be observed that the upper end of the jar or block which contacts with the impact block is also curved transversely so that the jar and the impact block will have very narrow areas of contact and that any sand in between will be forced outwardly and away from these contacting surfaces when the jar or block rotates, due to the re-winding of the rope when the drill rests on the bottom of the well, and hence there will be little or no sand or other grating material between these surfaces.

The jar or block is formed of such a diameter relative to the internal diameter of the bore that when the jar or block moves to the bottom of the socket any sand or water in the lower end of the socket above the sealing block can pass up and escape out through the notch or the slot above the notch.

The construction herein shown and described renders the manufacture of the socket and the assembling thereof very easy and simple. The body of the socket after being externally shaped can be bored up to the shoulder while the small bore can be made from the upper end, the outward flaring wall at the lower end can be cut by a suitable tool and then threaded, while the slot with its notches through which the swivel jar is inserted, can easily be cut through by suitable tools. The swivel jar or block is made with a longitudinal opening therethrough, such opening flaring outwardly toward the lower end of the socket so as to permit of the securing of the end of the rope in such flared opening as is now the practice.

I claim herein as my invention:

1. The combination of a body portion having a cylindrical bore extending with uniform diameter from its lower end and a tubular rope guiding extension at its upper end, the internal diameter of such extension being less than that of the bore thereby providing an annular shoulder or abutment, a movable jar or block arranged in the bore and adapted to be connected to an operating rope, an internally threaded box at the lower end of the body portion, a plug secured in the bore above the threaded box, the walls of the socket above the sealing plug being slotted for the admission and removal of the jar or block and a retaining bar having a width less than that of said slot and means for so holding the bar in the slot that it may be shifted on an axis adjacent to one end to permit of the insertion and removal of the jar or block.

2. The combination of a body portion having a bore extending with uniform diameter from its lower end and a tubular rope guiding extension at its upper end, the internal diameter of the extension being less than that of the bore thereby forming an annular shoulder or abutment, an annular impact block bearing at one end against the abutment at the upper end of the bore and having a transversely curved surface at its opposite end, an annular jar or block fitting loosely in the body portion, the surface at the upper end of the jar or block being transversely curved, the jar or block, the impact block, and the bore of the body portion being made of such relative lengths as to afford such a length of movement to the jar or block that a substantial blow can be imparted to the body portion by the upward movement of the jar.

3. The combination of a body portion having a cylindrical bore extending with uniform diameter from the lower end and a tubular rope guiding extension at its upper end, the internal diameter of such extension being less than that of the bore, an annular impact block bearing at one end against the abutment at the upper end of the bore and having a transversely curved surface at its opposite end, an annular movable jar or block arranged in the bore, the surface at the upper end of the jar being transversely curved, the socket having an opening through its side for the insertion and removal of the jar of the impact block, the upper end of such opening extending up to or approximately to the lower end of the impact block and a removable bar for holding the jar within the bore.

4. The combination of a body portion having a cylindrical bore extending with uniform diameter from its lower end and a tubular rope guiding extension at its upper end, the internal diameter of such extension being less than that of the bore, thereby providing an annular abutment or shoulder, a cylindrical jar or block adapted to be connected to an operating rope arranged in the bore, the wall of the bore being slotted to permit the insertion and removal of the jar or block, the end walls of the slot being notched, a retaining bar arranged longitudinally of the slot and having its ends projecting into the notches at the end of the slot and pins passing through the wall of the socket and the ends of the retaining bar for holding the latter in position.

In testimony whereof, I have hereunto set my hand.

PAUL ARBON.