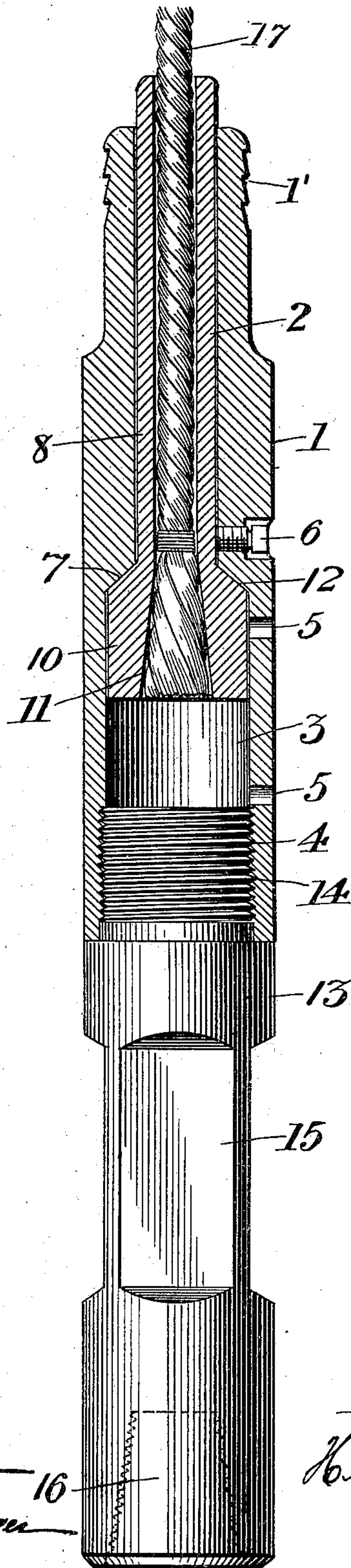


No. 734,664.

PATENTED JULY 28, 1903.

H. M. BRITTAN.  
ROPE SOCKET SWIVEL.  
APPLICATION FILED AUG. 14, 1902.

NO MODEL.



Witnesses:

Geo. H. Simon

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Inventor:

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# UNITED STATES PATENT OFFICE.

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AMERICAN STEEL & WIRE COMPANY, A CORPORATION OF NEW JERSEY.

## ROPE-SOCKET SWIVEL.

SPECIFICATION forming part of Letters Patent No. 734,664, dated July 28, 1903.

Application filed August 14, 1902. Serial No. 119,624. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY M. BRITTAN, a citizen of the United States, residing at San Francisco, county of San Francisco, State of California, have invented certain new and useful Improvements in Rope-Socket Swivels; 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 well-drilling apparatus, and has for its object to provide a simple and efficient swivel connection between the rope and the drill-head that will allow the rope to readily adjust itself to the irregular conditions imposed upon it during the operation of picking up a load—viz., the drill-head—and dropping it again. During the operation of lifting the drill and its connected parts the weight imposed upon the rope causes the latter to revolve in a direction to untwist the lay. It is therefore necessary when the weight of the tools is off the rope that there be provided a swivel connection between the tools and the rope to permit the latter to twist back into its natural position. The mechanism of my present invention provides such a swivel connection and is designed not only to insure the proper adjustment of the rope after each untwisting effect produced by lifting the tools, but also serves to permit this twisting action of the rope to be taken advantage of in revolving the tools continuously in one direction. This continuous turning of the tools is very advantageous for the reason that it results in drilling the hole perfectly straight, and heretofore this effect had been produced by especial mechanism for imparting a partial revolution to the tools or to the rope during each stroke.

My invention is illustrated in the accompanying drawing, in which 1 represents a shell or casing generally cylindrical in shape and formed as a unitary structure—that is to say, being formed in one piece—and provided at its upper end with a longitudinal bore 2, below which is a relatively large chamber 3. Between the bore 2 and the chamber 3 is a tapered or conical seat 7. The lower end of the chamber 3 is provided with an internal

screw-thread to receive the correspondingly-screw-threaded stub 14 of the substitute 13. This substitute, which may be of any approved form, is provided with the usual tool-square 15 about midway of its length and the ordinary tapered box 16 at its lower end, which is adapted to receive the upper end of the drilling-tool. The upper end of the shell or casing 1 is provided with a series of grooves 1', which pass circumferentially about the neck thereof and serve, in case the tools are lost in the well, as means for securing a firm hold on them by the common form of slip-socket employed for that purpose.

Fitted within the upper part of the chamber 3 is a cylindrical piston 10, having a hollow stem 8, which communicates with the flared opening 11, extending through the piston. That portion of the piston 10 which joins the stem 8 constitutes a beveled shoulder 12, which fits the corresponding beveled seat 7 of the shell and affords a firm even bearing between the piston and the shell. The stem 8 extends through the cylindrical bore of the shell and projects a slight distance above the end of the latter. Firmly secured within the piston 10 and extending through the longitudinal hollow of the stem is the supporting-rope 17. Said rope may be secured to the piston and stem in any approved manner; but for the purposes of my invention I prefer to babbitt the rope in the bore of the piston and stem. It is to be observed that the piston 10 occupies only a portion of the chamber 3, so that the piston is allowed to drop a certain distance in the casing, thereby relieving the rope in case there is too much slack run into the drill-hole and likewise imparting a certain degree of elasticity to the whole mechanism. Suitable lateral orifices 5 5 are provided at the upper and lower portions of the enlarged chamber 3 to permit the piston 10 to readily eject any borings or other foreign matter entering the chamber, thereby preventing any clogging of the parts.

Under certain conditions of operation—e. g., in the operations of driving the well-casing or jarring the tools loose in case they are stuck at the bottom of the well—it is desirable that the swivel connection between the rope



and the drill-head be dispensed with, and for this purpose I provide a set-screw 6, which is let in through a suitable orifice in the side of the shell and is adapted to bear firmly against the stem of the piston, thereby locking the parts together and preventing any relative rotation between them.

As before stated, the twisting action of the rope is taken advantage of to revolve the tools continuously in one direction, and as this turning is determined by the lay of the drill-rope it will be of particular advantage to have the rope laid up in a direction opposite to the screw-threads of the tools—that is to say, if right-hand threads are employed in connecting the various tool-joints it will be advisable to employ a left-laid rope in order that the action of the rope will turn the tools to the right, keeping their joints screwed tightly.

It is to be noted that the particular features of my improved swivel are available whether the rope employed be a wire rope or a Manila line. In either case the particular arrangement of parts results in the even and continuous turning of the tools in the desired direction and insures a perfectly straight hole and likewise provides for the exact readjustment of the rope to its proper twist after it has been relieved from the weight of the drill-head.

Having thus described my invention, what I claim is—

1. A rope-socket swivel for well-drilling apparatus, comprising a shell provided with a cylindrical chamber, a rotary piston mounted

in said chamber, said piston having a longitudinal bore in which the drill-rope is attached, and means for locking the piston to the shell to prevent relative rotation of said parts, whereby the device may be employed as a swivel connection or as a rigid connection as desired.

2. A rope-socket swivel for well-drilling apparatus, comprising a shell formed as a unitary structure provided with a cylindrical chamber at one end, and a reduced bore at the other, a rotary piston comprising a head and a stem occupying the cylinder and the bore respectively, said chamber and said head having cooperating inclined surfaces and said piston having a longitudinal bore in which the drill-rope is attached.

3. A rope-socket swivel for well-drilling apparatus, comprising a shell provided with a cylindrical chamber at one end, and a reduced bore at the other, a tapered seat between the chamber and the bore, a rotary piston comprising a head and a stem occupying the cylinder and the bore respectively, an inclined shoulder between the head and stem and adapted to engage said tapered seat, said piston having a longitudinal bore in which the drill-rope is attached.

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

HENRY M. BRITTAN.

Witnesses:

ALFRED A. ENQUIST,  
EDWARD MALONEY.