

(No Model.)

P. YORKE.  
ROPE SOCKET.

No. 448,903.

Patented Mar. 24, 1891.

Fig. 1.

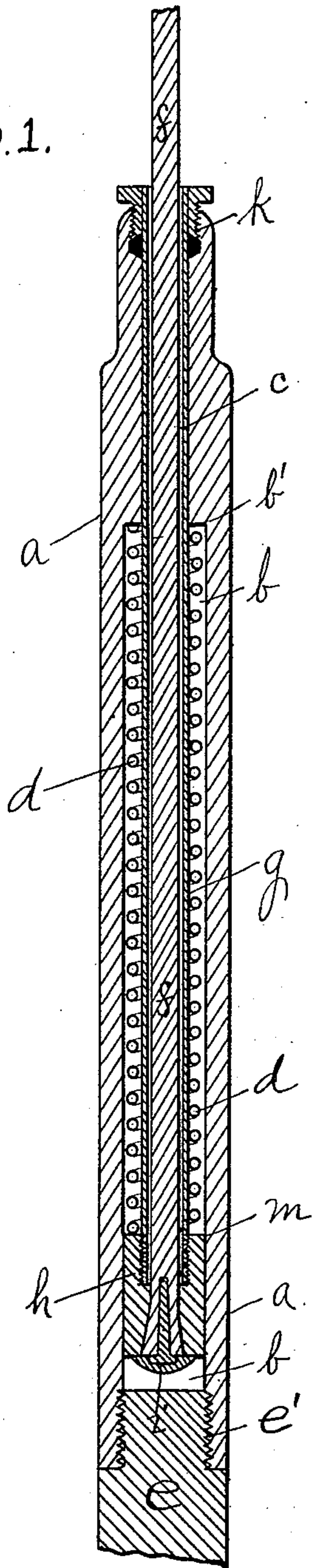
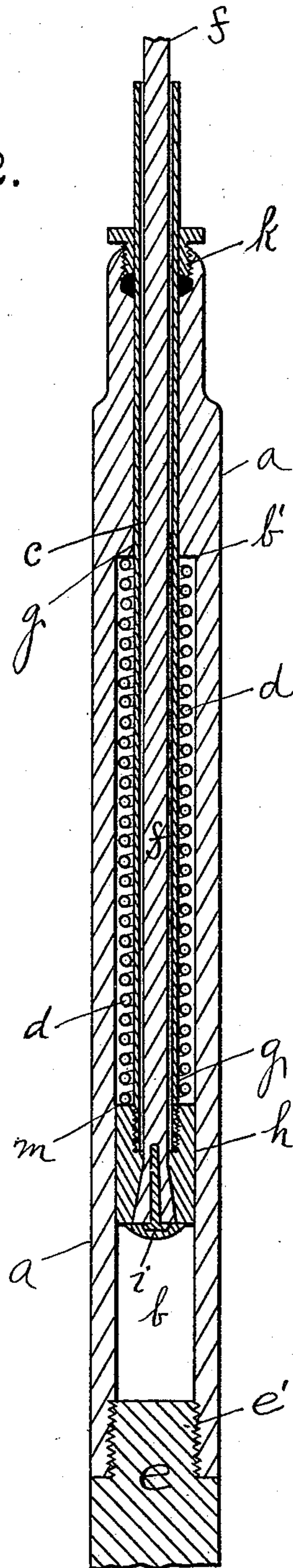


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## ROPE-SOCKET.

SPECIFICATION forming part of Letters Patent No. 448,903, dated March 24, 1891.

Application filed August 11, 1890. Serial No. 361,728. (No model.)

*To all whom it may concern:*

Be it known that I, PATRICK YORKE, a resident of Washington, in the county of Washington and State of Pennsylvania, have invented a new and useful Improvement in Rope-Sockets; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to what are known as "rope-sockets," its object being to provide a rope-socket for connecting wire rope to tools employed in Artesian wells or in other like places. In the use of wire rope for drilling purposes it is found that some classes of rope are too stiff and unyielding to give the desired play to the drilling or other tools, and that as a rigid socket or connection between the wire rope and tools is employed the necessary quick spring or yield always found desirable for rapid drilling or like work cannot well be obtained, while there is great liability of the heavy jar upon the rope-socket consequent to the movement of the tools where they do not strike the rock or to the loosening of the tools, breaking the socket from connection with the rope or tools.

The object of my invention is to provide a rope-socket in which these difficulties are overcome and which provides a yielding joint between the ropes and tools adapted to sustain the heavy pressures and yet to guard the tools and rope from such great strain as would lead to the fracture of the socket or like connections.

To this end my invention comprises, generally stated, a rope-socket having a central seat or bore extending up into the same, a central journal or passage of smaller diameter than said seat extending through the socket, a sleeve or tube passing centrally from the opposite end into the rope-socket and to which the rope is connected, a collar secured to said rope or sleeve, and a spring confined between said collar and the base of the central seat of the socket, so that upon the movement of the tools this spring may be compressed between the collar connected to the rope and the base of the central seat of the socket and give the necessary springing movement to the tools while protecting the rope from heavy jars.

The particular improvements comprising

my invention will be hereinafter more particularly set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal central section of the rope-socket, showing the spring extended as in the ordinary position of the same; and Fig. 2 is a like view showing the sustaining-spring compressed as at the end of the stroke of the tools.

Like letters of reference indicate like parts in each figure.

The body *a* of the rope-socket is formed of wrought metal of as high strength as practicable, the socket having extending up centrally within the said body the seat *b*, which extends from the lower end thereof toward the upper end, the journal or passage *c* extending from the upper end of said seat *b* through the top of the socket. The seat *b* is of much greater diameter than the passage *c*, the base of the seat *b* forming an annular shoulder *b'*, against which one end of the spring *d*, which fits within the seat *b*, is confined. The lower end of the passage *b* is threaded, as at *e'*, for the reception of the threaded end of the tools *e*, any desired tool being thus connected to the socket, or any other suitable devices being connected to the socket according to its use.

The rope *f* is a wire rope of suitable diameter, and it extends through a tube *g*, which is journaled within the passage *c*, said tube sliding within said passage. The lower end of this rope is connected to a collar *h* in any suitable way, such as spreading the same and driving in a spike, as at *i*, and rabbeting said spike to retain it in position, the collar *h* having a downwardly-flaring hole thereon, in which the end of the rope is thus spread. The tube *g* may either be connected to the collar *h* or may be connected to the wire rope in suitable way, it being shown as screwing into the collar *h*, so that when connected thereto the collar *h* forms the lower bearing or collar to confine the spring *d*, and as said spring is compressed in case of a strain upon the rope the tube *g* slides through the passage *c*, friction between the socket and rope being thus overcome.



In order to prevent the entrance of dirt or like substance into the journal or passage *b* of the socket, I prefer to form at the upper end of the socket a stuffing-box *k*, which fits  
5 closely around the tube-sleeve *g*, its gland screwing into the upper end of the socket-body *a* and so forming a slip-joint, which will prevent the entrance of sand or like solid material. The end of the tool screwing into  
10 the lower end of the seat *b* will of course close that end thereof.

The spring *d* is made of suitable strength and tension, according to the uses to which it is to be applied. For example, in carrying  
15 the very heavy tools used in Artesian-well drilling the spring must be of great strength, sufficient to bear the weight of said tools under ordinary strains, but yielding to the momentum of the tools at the end of the downward stroke or commencement of the upward  
20 stroke of the rope. For other purposes a lighter spring may be employed, as may be found desirable. Between the spring *d* and the collar *h*, secured to the rope, I prefer to  
25 employ a loose washer *m*, which will overcome friction between the spring and collar and permit the tools and socket to swing around on the rope, the socket in such case forming a swivel-joint.

30 In the use of the rope-socket in connection with drilling or other like operations in Artesian wells as the tools are drawn up and lowered through the wire rope *f* by the walking-beam the spring is usually sufficient to  
35 bear the weight. Where, however, in connection with drilling, it is desirable to have a sufficient spring or yield in the line to enable the tools to strike a blow, such as in drilling, in case the wire rope will not yield sufficiently  
40 to give this spring, the momentum of the tools will cause the spring *d* to be compressed within the rope-socket, the socket being carried down by the tools, while the spring is compressed between the annular shoulder *b'* at  
45 the base of the seat *b* of the socket-body and the collar *h*, secured at the lower end of the rope. As soon, however, as the tools recoil from the stroke or are freed through the action of the jars, the spring *d*, being of sufficient  
50 strength to bear the weight of the tools, will again expand, forcing the collar *h* toward the lower end of the seat *b* of the socket-body. Practically all friction between the rope and the socket-body is during this movement overcome by the tube or sleeve *g*, fitting around  
55 the rope within the journal or passage *c* and the loose washer *m*, and all wear upon the rope by the movement of the same within the

socket is also overcome in the same manner. In case of the fracture of the spring *d* by any  
60 abnormally heavy strain brought upon it, it is evident that all liability of the loss of the tools is overcome, as the collar *h*, secured at the lower end of tools, is still confined within  
65 the seat *b* of the socket-body, and until it is separated from the wire rope no such action can occur.

My improved socket is efficient for the purposes intended, and has special advantages in  
70 drilling with stiff or unpliant wire rope in providing for the same the spring necessary for effective drilling, though it may be employed to advantage also in many other uses of wire ropes. It is also simple in construction and adapted to stand very heavy strains.  
75

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a rope-socket, the combination, with a socket-body having a connection for the tools at the base thereof, a central seat above the  
80 same, a central journal or guide passage above the central seat, and an annular shoulder forming the upper end of the seat at the base of said passage, of a wire rope extending through said guiding-passage and having a  
85 guiding-collar secured at the base thereof and fitting within said central seat, and a spring confined between said collar and said annular shoulder, substantially as and for the purposes set forth.  
90

2. In a rope-socket, the combination of the socket-body having a journal or passage *c* and the central seat or passage *b*, having the annular shoulder *b'*, the rope *f*, having the collar *h* secured at its lower end and having the  
95 tube *g* passing through the journal *c*, and the spring *d*, confined between the collar *h* and annular shoulder *b'*, substantially as and for the purposes set forth.

3. In a rope-socket, the combination of the  
100 socket-body having the journal or passage *c* and the central seat *b*, provided with the annular shoulder *b'*, the rope *f*, having the collar *h* secured at its lower end and having the tube *g* passing through the journal *c*, the  
105 spring *d*, confined between the collar *h* and annular shoulder *b'*, and the stuffing-box *k* around said tube *g* at the upper end of the socket-body, substantially as and for the purposes set forth.  
110

In testimony whereof I, the said PATRICK YORKE, have hereunto set my hand.

PATRICK YORKE.

Witnesses:

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