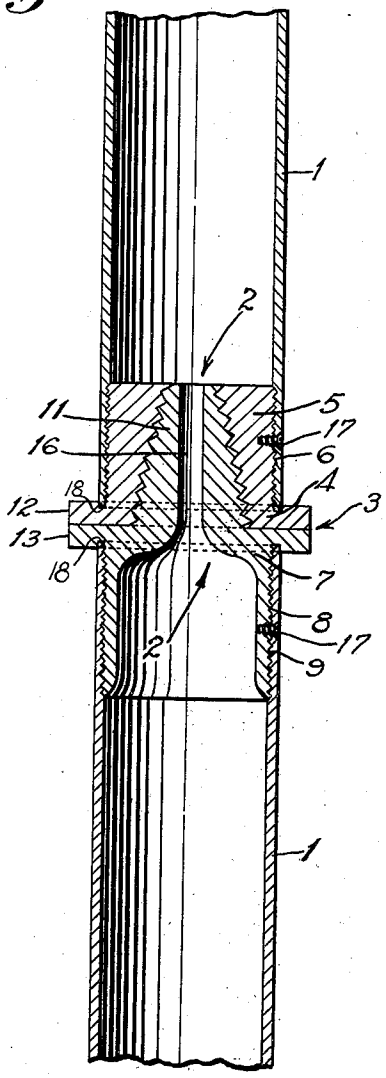
J. A. WINTROATH.

BORING STEM.

APPLICATION FILED FEB. 10, 1913.

1,079,681. Patented Nov. 25, 1913.

Fig. 1



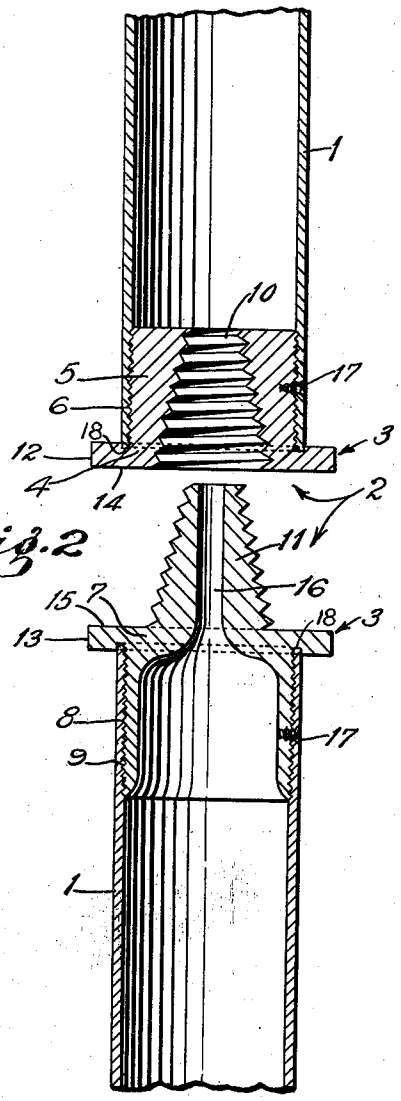


Fig. 2

Witnesses:—
Thor Sjöberg
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Inventor
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by James P. Townsend
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UNITED STATES PATENT OFFICE.

JOHN A. WINTROATH, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO LAYNE & BOWLER CORPORATION, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

BORING-STEM.

1,079,681. Specification of Letters Patent. Patented Nov. 25, 1913.

Application filed February 10, 1913. Serial No. 747,575.

To all whom it may concern:

Be it known that I, JOHN A. WINTROATH, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Boring-Stem, of which the following is a specification.

This invention relates to hollow stems used for boring wells and other holes into the earth, and which comprise pipe sections having their ends provided with rugged coupling members whereby said sections may be rapidly and conveniently connected to form and lengthen the boring stem as the same penetrates into the earth. The coupling means used in these boring stems are provided with longitudinal openings, uniting the successive pipe passages, so that the stem is hollow along its whole length. This construction is adopted so that water may be forced down through the boring stem to the boring tool below. This water issues through the tool and rises through the bored hole, thereby carrying the borings upward and discharging them at the surface of the earth, and also keeping the boring stem separated from the sides of the hole.

The novelty in this invention resides in a new coupling, the use of which results in materially decreasing the coupling weight, and in noticeably decreasing the expense of manufacture, without sacrificing a single advantage of this type of couplings. This reduction in weight is an important feature, because the boring stems are often several hundred feet in length and have the coupling means located at 20-foot intervals along same. By reducing the weight of each coupling, therefore, a considerable reduction in the total weight of the boring stem is effected, so that lighter and less expensive machinery may be used for raising, rotating, or otherwise operating the same.

The accompanying drawings illustrate the invention.

Figure 1 is a fragmental axial section through the boring stem, and shows the ends of two successive pipe sections connected by the novel coupling means embraced in this invention. Fig. 2 is a similar view showing the pipe sections disconnected from each other.

The extremities of adjacent pipe sections 1 are provided with coupling means 2, the same having shoulder means 3 that extend outward beyond the outer periphery of the pipes 1 for a purpose hereinafter described. The coupling means 2 comprise two detachable parts, each of which is tightly but detachably secured to consecutive pipe section ends. The first of these parts 4 is built in the form of a socketed coupling member, having an externally threaded seat portion 5, adapted to be screw-seated upon the internally threaded end 6 of one pipe section; while the second of said parts is built in the form of a pin coupling member 7, having an externally threaded seat portion 8, adapted to be internally screw-seated upon the internally threaded end 9 of another section.

The socketed coupling member 4 is provided with a longitudinally tapered and relatively coarse threaded socket 10, Fig. 2, extending into and completely through the externally threaded seat portion 5; while the pin coupling member 7 is provided with a similarly tapered and relatively coarse threaded pin 11, adapted to screw into the socket 10 for rapidly coupling successive pipe sections together.

The shoulder means 3 may be formed in any suitable manner, but is shown to comprise two annular abutting flanges 12 and 13 on coupling members 4 and 7, the abutting faces 14 and 15, Fig. 2, of said flange being accurately machined so as to fit snugly against each other.

Through the tapered pin 11 passes the longitudinal opening 16 through which the water is let down from pipe section to pipe section until it issues from the boring tool (not shown in the figures). Since the pipes conduct water, it is obvious that the coupling members must be seated onto their respective pipe ends in such manner as to form a water tight fit with the same; and also that the machined abutting faces 14 and 15 of said coupling members may also seat against each other to form a water tight fit through which the water in the stem cannot leak.

If preferred, a tapered screw 17, or any other easily removable stay, may be passed through the pipe section and coupling members 4 and 7 so as to firmly seat or lock said pipe sections rotatively to their respective coupling members.

It will be understood of course, that a

boring stem usually comprises a long series of pipe sections 1, united by a corresponding series of couplings 3, and that said stem is lengthened by coupling one or more pipe sections 1 to the top of said stem as it penetrates deeper and deeper into the earth. In this type of drilling it becomes necessary to connect and disconnect the pipe sections so as to assemble and dismantle the boring stem many times before the hole is actually sunk. One cause for this frequent dismantling and re-assembling of the boring stem is that the boring tool must be raised out of the hole and resharpened very often. By providing the pipe section ends with coupling members 4 and 7 all the wear and tear, occasioned by the frequent dismantling and reassembling of the boring stem, is brought onto the relatively coarse threads in socket 10 and on pin 11, and these threads, preferably being very coarse, constitute a rugged coupling connection between the pipe sections and are therefore very well adapted to sustain the wear and tear occasioned by frequent connection and disconnection.

Formerly the coupling was done directly on the externally threaded ends of the pipe section, which threaded ends becoming worn, very soon necessitated either the substitution of a new pipe section, or the returning of the relatively fine threads of the old section, both of which operations are expensive. By providing coupling members 4 and 7, however, the expensive pipe sections are subject to no wear whatsoever, and may be used practically indefinitely; and the threads on pin 11 and socket 10 being relatively coarse stand up very long, so that the replacing or re-turning of the coupling members involves a very slight annual expense. If found necessary or desirable a set screw 17 will be provided in order to rotatively lock the pipe to its coupling member. Furthermore, by tapering sockets 10 and pin 11, and by threading the same coarsely, these members may be very rapidly and easily disconnected. With a taper pitch and a screw pitch, similar to that shown in the drawings, two or three turns of one coupling member will couple or uncouple the members from each other, it being noticed, however, that approximately nine threads are brought into engagement by these two or three turns, more or less, and that this slight rotation therefore insures an extensive gripping action between the coupling members. By the rapidity of this coupling a considerable labor economy is effected. Couplings broadly similar to this, however, have been heretofore used, but where many of the above-described features have been combined the coupling members were usually seated externally, rather than internally, upon externally-threaded pipe sections. With that construction each of the coupling members separately are necessarily heavier in weight than those embraced in this invention. I have effected a very material decrease in this weight by tightly but detachably seating each of the coupling members separately and internally on the inside of the pipe sections, which change made it possible, among other things, to form coupling member 4, with its socket 10, extending into the externally-threaded seat portion 5, whereby the metal in this portion serves the double purpose of providing the seat and forming the socket. This double utility cannot be attained when the socketed coupling member is externally seated onto the pipe end. Though the advantage just noted constitutes one source whereby the weight of the socketed coupling member is reduced, it will be also seen that the weight of each of the coupling members is further reduced separately and additionally in view of the reduction effected in diameters of the seat portions 5 and 8, when these are transferred from the exterior to the interior of said pipe sections.

It will be understood, of course, that not all of the foregoing modes of reducing the coupling weight need be practiced, but that either of the coupling members may be so formed as to partially avail themselves of the weight reduction herein disclosed, and that said partial reduction of the total coupling weight lies within the spirit of this invention.

By reducing the weight of each coupling as has been hereinbefore described a considerable reduction in the weight of the boring stem is effected, so that lighter and less expensive machinery may be used for raising, rotating, or otherwise operating the stem.

The shoulder means 3 may be formed in any suitable manner, but some shoulder is necessary in order that the collars in the elevators used for raising and lowering the boring stem may find an abutting face onto which they may bear. These collars are sprung around the pipe section beneath the shoulder means, and are then raised to abut said shoulders, after which the further raising of said collar will obviously result in lifting the boring stem out of the earth.

In some cases the weight of the stem portion beneath a particular coupling 2 may be so great that the threads on the screw-threaded seat-portions 5 and 8 of the coupling will tend to wedge or flare the pipe ends outward, and may expansively strain said ends to such an extent as to tear the pipe unless suitable counteracting provision is made. For avoiding such results this invention includes an annular groove 18 formed in shoulder means 3, and adapted to receive the end of pipe 1, as shown in the

figures. Such a groove partially embraces the tip of the pipe section and thereby greatly reinforces same, so as to avoid the bursting effect referred to.

From the foregoing detailed description and mode of operation it is thought that the construction and mode of operation of the coupling embracing this invention will be clear.

I claim:—

A light weight boring stem comprising sections of pipe having internally screw-threaded ends, coupling means for said pipe sections, said coupling means being formed so as to provide a shoulder beyond the outer periphery of said pipe sections, said coupling means each comprising a socketed coupling member and a pin coupling member, said socketed coupling member having an externally threaded seat portion adapted to tightly screw-seat said socketed member internally onto the internally-threaded end of a pipe section, said socketed coupling having a longitudinally tapered coarse-threaded socket which extends into and is substantially co-extensive with said internally-threaded seat portion, so that the very same metal serves for forming the coarse-threaded socket and the externally-threaded seat; and said pin coupling member also being internally screw-seated onto another of said internally-threaded pipe ends, said pin coupling member having a tapered relatively coarse-threaded pin with a longitudinal opening through same, said pin being adapted to screw into said socket for rapidly connecting or disconnecting successive pipe sections together.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this twenty-first day of January, 1913.

JOHN A. WINTROATH.

In presence of—
PAUL D. BOWLER,
ROBERT A. STEPS.