No. 646,597. Patented Apr. 3, 1900.

M. C. BULLOCK, Dec'd.

M. A. BULLOCK, Executrix.

SHOULDERED COUPLING FOR SHAFTS, &c.

(No Model.) (Application filed Apr. 17, 1899.)

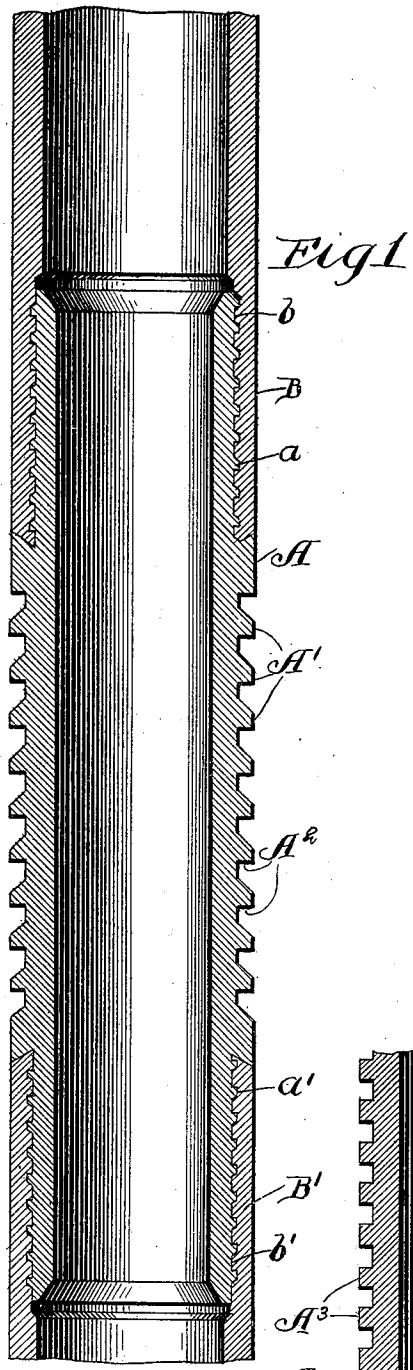


Fig 1

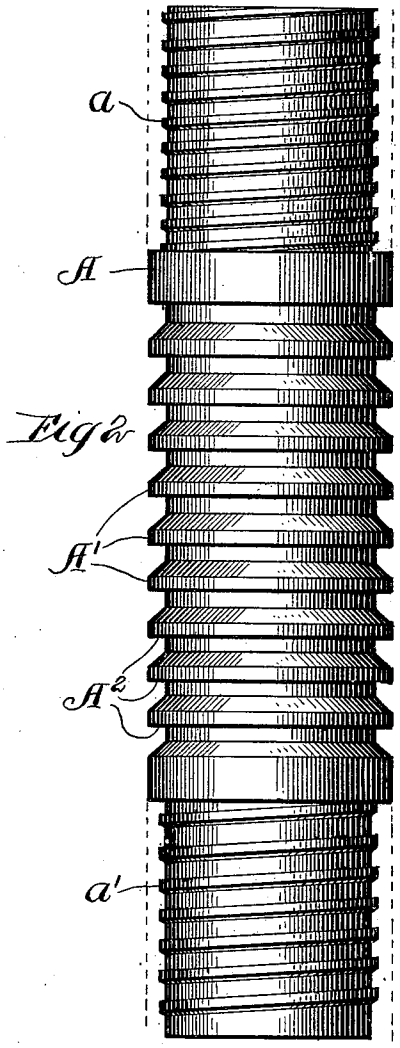


Fig 2

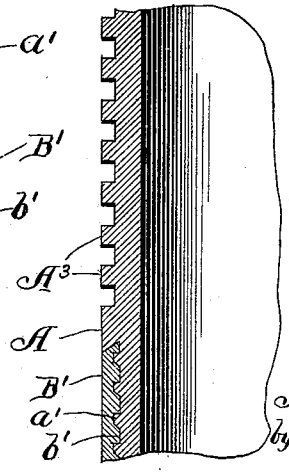


Fig 3

Witnesses:-
Carl F. Crawford
C. M. Hill

Inventor:-
Milan C. Bullock
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by Poole & Brown her Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MARY ANN BULLOCK, OF CHICAGO, ILLINOIS, EXECUTRIX OF MILAN C. BULLOCK, DECEASED, ASSIGNOR TO SAID MARY ANN BULLOCK.

SHOULDERED COUPLING FOR SHAFTS, &c.

SPECIFICATION forming part of Letters Patent No. 646,597, dated April 3, 1900.

Application filed April 17, 1899. Serial No. 713,260. (No model.)

To all whom it may concern:

Be it known that I, MARY ANN BULLOCK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, am executrix of the last will and testament of MILAN C. BULLOCK, deceased, late a citizen of Illinois; that the said MILAN C. BULLOCK, deceased, was the inventor of certain new and useful Improvements in Shouldered Couplings for Shafts or the Like; and I, MARY ANN BULLOCK, executrix, as aforesaid, do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improved coupling for the sections or lengths of drill-rod tubes used in drilling apparatus—such as is employed for prospecting, well-boring, and like purposes—the coupling being intended to facilitate the lifting or withdrawal of the drill-rod from the bored hole or well.

Prior to the introduction of the diamond-drill boring the drill or couplings used consisted of outside coupling-sleeves into which the ends of adjacent drill-rod sections or tubes were inserted, such couplings forming an external enlargement of the drill-rod and forming relatively large shoulders which were utilized in hoisting and lowering the rods for engagement with the arms of a forked clamp to which the lifting-rope was attached. In the use of such a coupling a rod was hoisted by the engagement of the forked clamp with the uppermost coupling-sleeve until the ends of the coupling-sleeve below it came above the top of the hole, when the operator would slip a U-shaped support or holder beneath the shoulder of such lower coupling-sleeve and then lower the rod until its weight came on said U-shaped holder, which would hold the rod from dropping back into the hole until the forked clamp attached to the lifting-bolt could be again adjusted into engagement with the coupling. Upon the introduction of the diamond drill such outwardly-projecting couplings could no longer be used, as it became necessary to employ a rod that would be flush or smooth on the outside and should nearly fill the hole, so as to act as a guide to the diamond bit and prevent the rod from rattling or vibrating in the hole during its rotation. With the adoption of such flush-coupled rods came the necessity for special appliances for lifting the rod, which have taken the form of hoisting-plugs or lifting-jacks and similar devices having clamping-jaws arranged to engage with the outer surfaces of the rods, the jaws of such clamps being provided with serrations or teeth to prevent the rods from slipping through such clamps. In connection with such lifting-jacks are employed safety-clamps provided with serrated jaws arranged to grasp and hold the outside surface of the rods to support the rods while the clamping-jaws of the lifting-jacks are lowered to take a new hold. For moderate depths of holes devices of the kind described work successfully; but since the development of diamond drilling has brought about the boring of holes from two thousand to six thousand feet in depth much trouble has been encountered in the use of this class of appliances, where the weight of the rods is so great that the jaws of the chucks, lifting-jacks, and safety-clamps are required to be set up so tight, in order to prevent slipping, that it is a common occurrence that the rods are crushed and split by the lateral pressure thereon of the chuck-jaws and safety-clamps.

The present invention is intended to obviate the difficulties above referred to, and it embraces generally the feature of an inside coupling or one where the surface of the coupling is flush with the drill-rod sections joined thereby, and the portion of the coupling between the ends of said sections is provided with a plurality of grooves, recesses, or depressions, forming downwardly-facing shoulders adapted for engagement with teeth or projections on the jaws of clutches or safety-clamps. By this construction rods may be easily and safely held whatever may be the length of the line of the rods and no matter how heavy the weight thereof.

The invention may be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a section showing the joint in the drill-rod, the same consisting of a coupling-sleeve and the adjacent ends of two drill-

rod sections, which are joined thereto. Fig. 2 is a side view of the coupling-sleeve detached from the drill-rod sections. Fig. 3 is a detail section showing a modified form of the recesses in said coupling-sleeve.

As shown in said drawings, A indicates the coupling-sleeve of that kind known as an "inside" or "flush" coupling, and B B′ the ends of drill-rod sections or tubes, which are joined by the said coupling-sleeve. The main part or body of said coupling-sleeve A is of the same external diameter as the adjacent drill-rod sections, and the end portions of said coupling-sleeve are reduced in diameter and provided with screw-threaded parts *a a′*, which engage corresponding screw-threaded parts *b b′* on the rod-sections B B′. The screw-threaded connection between the said parts may be of any usual or preferred construction; but as herein shown the screw-threads have bearing-surfaces which at the sides of the threads that take the pressure due to the weight of the supported parts are perpendicular to the central axis of the rod. Moreover, as shown in the drawings, the ends of the drill-rod sections are beveled or inclined and engage corresponding conical and inwardly-tapering surfaces at the shoulders formed at the ends of the central or enlarged part of the coupling-sleeve.

Upon the central or thicker portion of the coupling-sleeve are formed a plurality of circumferential recesses A′ A′, which form a plurality of downwardly-facing shoulders A^2 A^2. As shown in Figs. 1 and 2, the lower side walls of the recesses A′ are made tapered or inclined to facilitate the engagement of the teeth of the clamping-jaws therewith, this construction making the outer parts of the recesses wider than their inner parts to enable said teeth to more readily enter the same for engagement with the downwardly-facing shoulders. This particular form of recesses is not, however, essential, and they may be of a square form, like the recesses A^3, which are similar to those separating the threads of a square-threaded screw, as seen in the modification, Fig. 3. The coupling-sleeve so provided with recesses adapted to form a plurality of holding surfaces or shoulders is made longer than usual, so as to be of sufficient length for proper engagement with the clamping devices used and to receive as many corrugations as may be required for the proper application of a safety-clamp or the jaws of a lifting-jack or those of a chuck by which the rod is secured to the feed-screw of a drilling-machine adapted to give rotative and advance movement to the drill-rod.

By providing the coupling-sleeve with recesses forming a plurality of shoulders, as described, it becomes possible to effect engagement of the clamping or chuck jaws with the tube without undue pressure thereon or such pressure as is likely to crush or injure the rod, while at the same time affording a positive and safe engagement of said jaws with the drill-tube. While the coupling-sleeve illustrated is provided with recesses forming continuous circumferential grooves and this construction is preferred because greatly facilitating the formation of the shoulders, yet it will be obvious that downwardly-facing shoulders adapted to afford proper holding engagement with the teeth of clamping-jaws may be provided by recesses in the coupling-sleeve having other form than continuous grooves, and it is not therefore desired that the invention should be restricted to a construction having such continuous or circumferential grooves.

What is claimed as the invention is—

1. A tubular coupling-sleeve for tubular drill-rods which is reduced in thickness at its ends to engage the adjacent ends of the drill-rod sections and is provided in its central thicker part with a plurality of recesses forming downwardly-facing shoulders.

2. The combination with tubular drill-rod sections, of a coupling-sleeve having its ends reduced in diameter and provided with screw-threads to enter and engage adjacent ends of the drill-rod sections and having its central thicker part flush with the outer surface of the drill-rod sections, and provided with a plurality of recesses or grooves forming downwardly-facing shoulders.

3. The combination with tubular drill-rod sections having conically-beveled ends, of a coupling-sleeve having its ends reduced in diameter and provided with screw-threads to enter and engage adjacent ends of the drill-rod sections and having its central thicker part flush with the outer surface of the drill-rod sections; said coupling-sleeve being provided with a plurality of peripheral recesses forming downwardly-facing shoulders and oppositely-facing inwardly-inclined surfaces at the ends of the central part of the coupling-sleeve adapted to engage the beveled ends of the drill-rod sections.

In testimony that I, MARY ANN BULLOCK, executrix, as aforesaid, claim the foregoing as the invention of the said MILAN C. BULLOCK, deceased, I affix my signature, in the presence of two witnesses, this 11th day of April, A. D. 1899.

MARY ANN BULLOCK,
Executrix of the estate of Milan C. Bullock, deceased.

Witnesses:
GRACE C. BARTHOLF,
MARGARET F. BULLOCK.