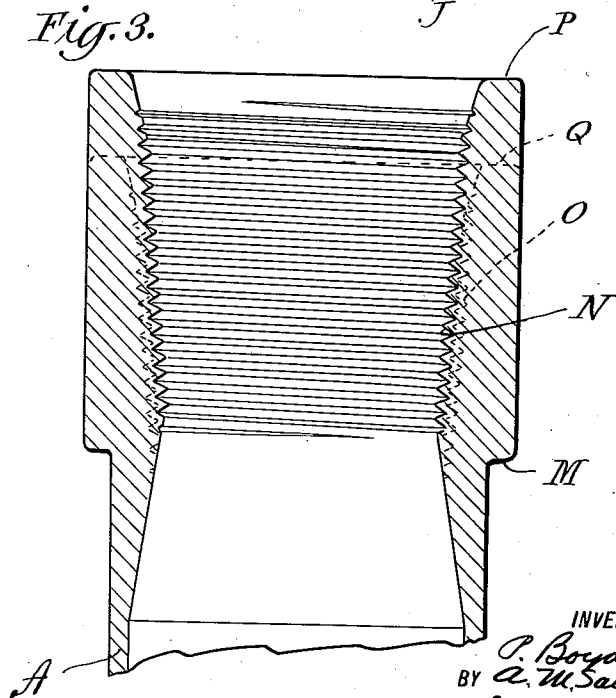
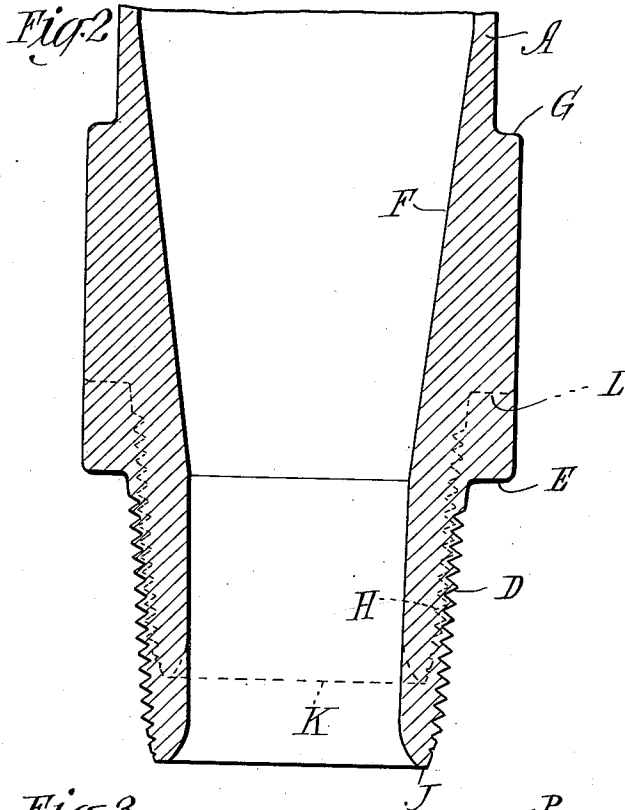
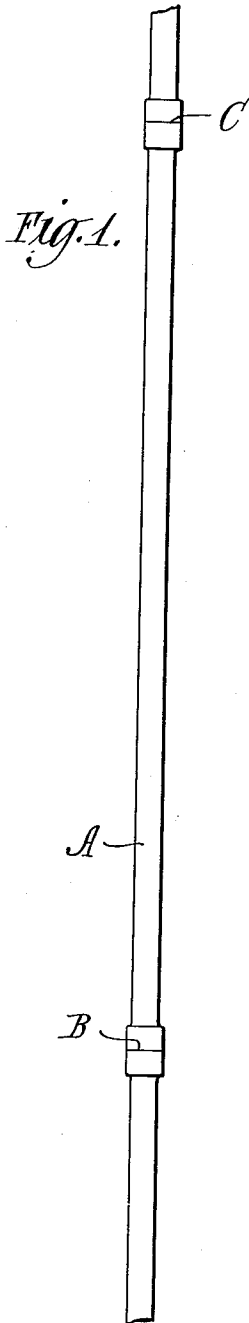


P. BOYD & A. M. SAUNDERS.
 DRILL TUBE SECTION,
 APPLICATION FILED MAR. 26, 1918.

1,287,203.

Patented Dec. 10, 1918.



INVENTOR
P. Boyd
 BY *A. M. Saunders*
D. Anthony Thoma
 ATTORNEY

UNITED STATES PATENT OFFICE.

PETER BOYD, OF BEAVER, AND AUGUSTUS M. SAUNDERS, OF McKEESPORT, PENNSYLVANIA, ASSIGNORS TO NATIONAL TUBE COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

DRILL-TUBE SECTION.

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To all whom it may concern:

Be it known that we, PETER BOYD, of Beaver, in the county of Beaver, and AUGUSTUS M. SAUNDERS, of McKeesport, in the county of Allegheny, both in the State of Pennsylvania, have invented certain new and useful Improvements in Drill-Tube Sections, of which the following is a specification.

Our invention relates to drill tubes used in boring deep wells and formed of a series of detachably connected sections, carrying a boring tool at the lower end. The drill tube is rotated in practice and is subjected to torsional strains. The common construction of tube consists of comparatively short lengths of pipe, two of which are coupled together to constitute each section, and each section of which is connected to the next by a separate device referred to as the "tool joint" and usually of the box and pin type. Other styles of joint are in use, but this is the commonest form. According to our invention the drill tube is made up of tubular sections which are in one piece from end to end and have their opposite ends shaped to form a box and pin connection, the ends of the section being upset and shaped in a manner defined more particularly hereinafter so as to facilitate the drilling operation by giving the driller fewer joints to contend with and by avoiding certain other disadvantages arising in the old types.

The accompanying drawings illustrate an embodiment of the invention illustrated.

Figure 1 is an elevation of a drill tube made up of our improved sections;

Figs. 2 and 3 are vertical sections respectively of the lower end of one section and the upper end of the adjoining section.

Referring now to the embodiment of the invention illustrated each section A, Fig. 1, of the tube extends unbrokenly from one joint B to the next joint C, having its ends upset and threaded in the manner shown for one end in Fig. 2 and for the other end in Fig. 3.

The pin end, Fig. 2, is upset both inward and outward, by several operations worked out by practice, so as to increase the outside diameter and to decrease the inside diameter, the inside diameter being gradually reduced from that shown at A for the greater portion of the section to that shown

at the lower end. The outside diameter is increased sufficiently and then swaged and drawn to leave room for the cutting of the tapered thread or pin D and to leave a shoulder E for engagement by the end of the box so as to limit the amount of turning movement of one on the other in fastening them together and thus prevent stripping or injury to the threads and also the cracking of one or the other which sometimes occurs because of torsional strains and the rough handling to which they are subjected. The tapered face F on the inside of the upset pin end is approximately parallel to the taper of the thread D. The total distance of the upset portion, from the shoulder G to the end is made longer than is necessary for the screw joint initially cut. By reason of the surplus length from the end back to the shoulder G the tubes may be rethreaded a number of times when they become worn, without weakening the joint. The constant screwing of the sections together as they are lowered into the well and unscrewing them as they are raised wears the threads, and they are also sometimes injured in handling so that the possibility of numerous rethreadings is a substantial advantage. For example, if the threads D become worn or otherwise injured the pin end may be rethreaded as indicated in dotted lines at H, cutting back the lower end J of the pin to the point K and carrying the shoulder E back to the point L. By reason of the shape and proportions of the upset end of the section the joint rethreaded in this way is just as good and just as strong as it was originally; in fact, is substantially identical with the original joint.

Referring to the box and shown in Fig. 3, the end is upset to provide similar features of advantage. The external shoulder M, provides a convenient means for attaching a lifting or holding tool when the tube is being withdrawn and the sections unscrewed from one another. The metal is thickened inwardly so that when the initial tapered box thread N is worn or otherwise injured a new thread O or other threads, as wear takes place, can be cut and the initial end P of the box may be carried back to the point Q, leaving a box which is substantially identical with that initially formed.

With a section of this sort having its opposite ends upset and shaped as in Figs. 2 and 3 respectively, the work of the driller is immensely simplified. The joints can be rethreaded a number of times without weakening them and they are originally of the simplest and strongest construction as well as providing a cheaper drill tube on the end than heretofore used, as there is only one joint in the coupling instead of three, and no welds resorted to to obtain heavy ends.

What we claim is—

An improved drill tube section comprising a hollow metal tube having its ends integrally shaped and threaded to form a tapered threaded box and pin joint, the ends being upset outward to form shoulders for engagement by the lifting or other tools,

and having a shoulder on the pin end to be engaged by the box end to limit the movement of the parts together and prevent splitting of the box end and undue strain on the threads in screwing the sections together, the ends also being upset inward and for a length greater than is required for the joint when new so that new threads may be formed when the initial threads wear out and may be extended further into the upset portions and the outer ends of said upset portions removed, thus providing a new joint practically identical with the initial one.

In witness whereof, we have hereunto signed our names.

PETER BOYD.

AUGUSTUS M. SAUNDERS.