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2,461,107.

SAFETY JOINT

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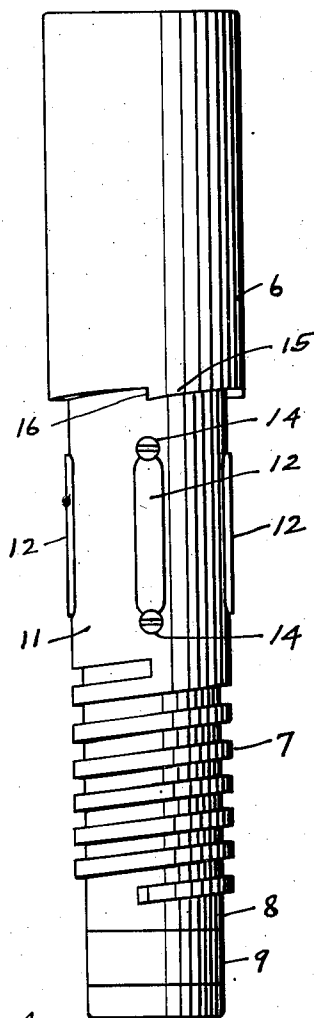
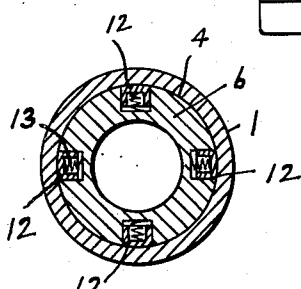
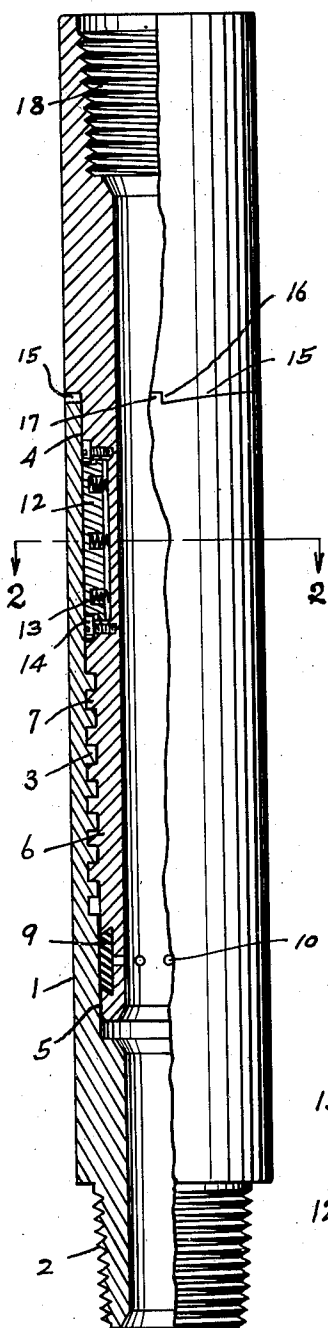


Fig. 3.

Fig. 2.

Fig.1.

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SAFETY JOINT

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1 Claim. (Cl. 287—125)

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This invention relates to a safety joint.

An object of the invention is to provide a safety joint adapted to be connected into a string of pipe which string is made up of sections connected together by threads and the safety joint, in the string, is of such construction that it may be more easily unscrewed than the other threaded connections of the string.

In carrying on operations in a well the drill stem, or other string of pipe in the well, sometimes becomes stuck so that it cannot be withdrawn and must be unscrewed and separated in order to recover as much of the string as possible. For example, the drill at the lower end of the drill stem may become stuck in the well bore; or a well packer on a string of well pipe may become stuck so that it cannot be released. In such case with the safety joint herein described incorporated into the drill stem above the drill or incorporated into the string of pipe above the packer the rotation of the drill stem, or string of pipe, reversely will cause the safety joint herein described to separate, without danger of unscrewing one of the threaded connections above, so that the major portion of the stem or string can be recovered.

It is another object of the invention to provide a safety joint of the character described which will not be liable to unscrew and cause the drill stem, or string of pipe, to separate while the same is being lowered into the well.

With the above and other objects in view the invention has particular relation to certain novel features of construction, arrangement of parts and use, an example of which is given in this specification and illustrated in the accompanying drawings, wherein:

Figure 1 is a side view of the safety joint partly in section.

Figure 2 is a cross sectional view taken on the line 2—2 of Figure 1; and

Figure 3 is a side elevation of the pin member.

In the drawings the numeral 1 designates the box member of the joint which is formed with an outwardly threaded pin 2, at one end, adapted to be screwed into the adjacent end of the section of drill stem, or tubular string, beneath. This box member has the internal coarse threads 3 and the internal blank portions 4 and 5 above and beneath said threads, the blank portion 4 being flush with the base of the threads and the blank portion 5 being flush with the crests of the threads. The numeral 6 designates the pin member, both the box member and pin member being tubular.

The pin member has the coarse, external threads 7 adapted to intermesh with the threads

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3 when the pin member is screwed into home position in the box member. The pin member has a blank portion 8 beyond the threads and countersunk into this blank portion there is an annular packing 9 which fits closely with the portion 5. The pin member has perforations 10 leading outwardly therethrough opposite the packing 9 whereby fluid flowing under pressure through the safety joint may operate against the packing 9 to hold it closely against the blank portion 5 of the box member.

On the opposite side of the thread 7 the pin member has the blank portion 11 which fits snugly within the blank portion 4 of the box member.

Countersunk into this blank portion of the pin member are the elongated friction members 12 which are seated on coil springs 13 whereby the friction members are held outwardly into frictional engagement with the blank portion 4 of the box member.

The friction members 12 are retained in place by the end set screws 14, 14 which are screwed into the pin member and against the heads of which the ends of the friction members engage.

The pin member has the external, cam shaped, end faces 15, 15 which are correspondingly pitched and terminate in the abrupt shoulders 16 which are adapted to engage with opposing shoulders 17 on the confronting end of the box member 1, when the pin member is screwed to home position. These interengaging shoulders 16 and 17 take the torsional strain to which the drill stem is subjected while drilling or to which the string of pipe is subjected when it is turned to the right so as to prevent the pin member from becoming screwed too tightly in the box member.

The friction members 12 frictionally engage the inside of the box member, as shown in Figure 1, so that the string of drill stem, or pipe, beneath will be held against unscrewing while going into the well.

It is to be noted that the upper end of the pin member has an internally threaded box 18 for connection to the string of drill stem, or pipe, above.

However, if the drill stem beneath the safety joint should become stuck in the bore so that it cannot be pulled out the drill stem may be rotated to the left and the pin member 6 screwed out of, and separated from, the box member 1 and the string of drill stem above then recovered from the bore; or if the string of pipe should be used in settling a packer in the well, or for carrying on fishing operations, with the safety joint herein described incorporated therein, above the

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packer, or fishing tool, should the packer, or tool, become stuck the string may be turned to the left and the safety joint separated, as above explained, and the string of pipe thus recovered. In either case the drill stem or string of pipe will be separated at the safety joint and not at some other coupling for the reason that the connecting threads thereof will be intermeshed loosely; however, said threads will not be permitted to become unscrewed, while going into the well, by reason of the frictional engagement of the friction members 12 with the internal blank portion 4 of the box member 1.

The invention herein described includes certain improvements over that type of pipe joint disclosed in United States Patent No. 2,075,427 issued to applicant on March 30, 1937.

The drawings and description are illustrative merely while the broad principle of the invention will be defined by the appended claim.

What I claim is:

A safety joint comprising, a box section having internal threads and being internally blank between the threads and the end of the section, a

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pin section having external threads adapted to be screwed into the internal threads and being blank beyond the threads, co-operating portions for transmitting torsional strains between the sections, a plurality of friction members countersunk into the blank portion of the pin and elongated longitudinally with respect to the pin, yieldable means acting against said friction members to hold them in frictional contact with the opposing blank portion of the box.

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