

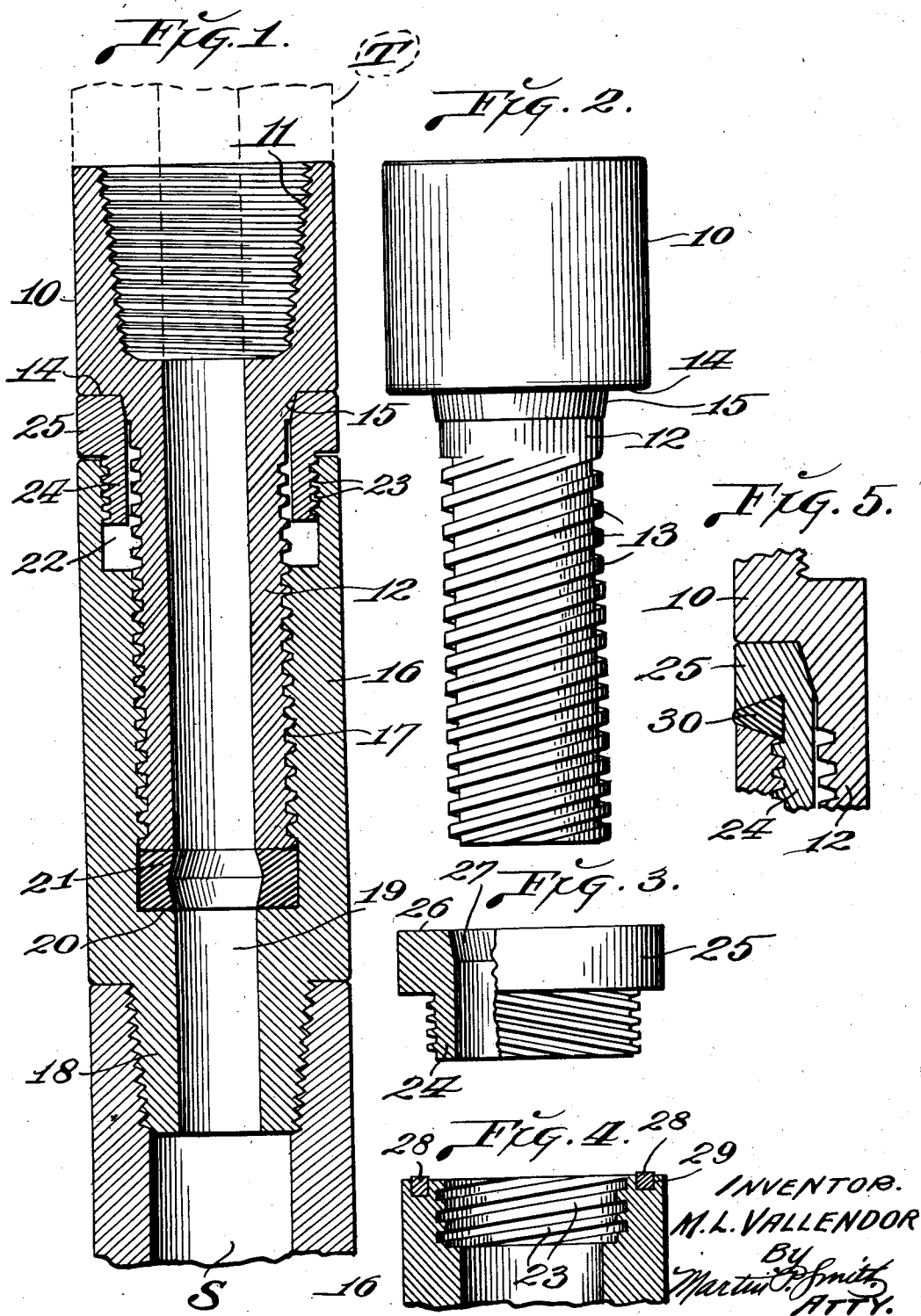
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SAFETY RELEASING JOINT FOR DRILL TUBES

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SAFETY RELEASING JOINT FOR DRILL TUBES

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My invention relates generally to well drilling apparatus and more particularly to a safety releasing joint for drill tubes, and the principal objects of my invention are to provide a safety releasing joint that is relatively simple in construction, inexpensive of manufacture, and capable of being readily combined with a drill line, further to provide a joint of the character referred to that may be easily and quickly "broken" or disconnected by a reverse rotary movement of the drill tube in which the joint is located, and further to provide a safety joint that will enable the drill tube to be broken or disconnected at a predetermined point, for instance, just above the stem of the drill, fishing tool or other tool or device that is carried by the lower end of the drill tube.

It will be understood that in the drilling of deep wells with rotary rigs the bit or cutting tool is carried by the lower end of the drill tube, and which latter is rotated by suitable power driven means at the top of the well. The hole formed by the drill in the ground is not always straight, due to the varying formation of the earth through which the drill passes, and under such conditions the drill tube is subject to considerable friction as a result of its contact with the formation at different points in the well hole.

In the event that the drill or other tool at the end of the drill line becomes anchored or "stuck" at the bottom of the well hole, it is necessary to disconnect the drill tube from the drill or other tool and remove the stuck tool by fishing operations.

In order to facilitate the work involved in fishing operations and to insure the breaking of a joint in the drill tube just above the drill or fishing tool used thereon, I propose to provide a safety joint in the lower portion of the drill tube which will insure the breaking or disconnecting of the drill tube at the inserted joint and thereby avoid the possibility of breaking a joint in the drill tube at some point in the intermediate or upper portion thereof when said drill tube is reversely rotated to effect the break or disconnection.

With the foregoing and other objects in view, my invention consists in certain novel

features of construction and arrangement of parts that will hereinafter be more fully described and claimed and illustrated in the accompanying drawings, in which:

Fig. 1 is a vertical section taken lengthwise through the center of a safety releasing joint of my improved construction.

Fig. 2 is an elevational view of the joint member that is connected to the lower end of the drilling tube.

Fig. 3 is an elevational view partly in section of a releasing nut or collar that forms a part of my improved joint.

Fig. 4 is a sectional view of a portion of the joint and showing a modified form of the packing used therein.

Fig. 5 is a detail sectional view showing a modified form of the packing used in my improved safety releasing joint.

Referring by numerals to the accompanying drawings which illustrate a practical embodiment of my invention, 10 designates a short cylindrical head within the upper portion of which is formed a threaded recess or box 11 that is adapted to receive the threaded pin that projects from the lower end of the drill tube T, and formed integral with and depending from the head 10 is an axially disposed tubular member 12, the same being provided on its external surface with quick acting threads 13, the threads having a relatively steep pitch.

Formed on the upper portion of the tubular body 12 and immediately beneath the under face of shoulder 14 at the lower end of body 10 is a relatively short tapered circumferential face 15.

A sub that receives the externally threaded portion of the tubular member 12 comprises a short cylindrical body 16, preferably of the same diameter as the head 10, and formed in the intermediate and upper portion of the body of this sub is a threaded chamber 17 that receives the threaded tubular member 12 when the parts of the joint are connected.

Formed integral with and depending from the body 16 of the sub is an externally threaded pin 18 that is adapted to be screw seated in the upper end of the shank S of a drill, fishing tool or the like.

Formed through the pin 18 and the lower portion of the sub 16 is an axially disposed bore 19 that is preferably of the same diameter as the diameter of the bore through the tubular member 12.

Formed between the upper end of the bore 19 and the lower end of the threaded chamber 17 is a horizontally disposed shoulder 20, and resting thereupon is a packing ring 21, preferably of rubber, that is engaged and compressed by the lower end of the tubular member 12 when the latter is screwed into the sub 16.

Formed in the upper portion of the sub 16 is a short chamber 22 the diameter of which is slightly greater than the diameter of the chamber 17 and the circumferential face of this enlarged chamber 22 is provided with quick acting threads 23 that are reversely arranged relative to the threads 13.

In the standard forms of rotary drilling rigs, or where the drill tube is rotated clockwise the tubular member 12 should be provided with right hand threads and the inner face of the chamber 22 should be provided with a left hand thread. In other words the two threads should be oppositely or reversely arranged relative to each other in order to bring about the desired results.

The threaded recess or chamber 22 receives the externally threaded portion 24 of a ring or collar that is formed integral with and depends from the underside of a nut 25, the diameter of which latter is approximately equal to the diameters of the head 10 and sub 16.

The upper face 26 of the body of the nut 25 is made flat in order that it may bear directly against the under face 14 of the body 10, and formed in the upper portion of the opening through the nut and its ring or collar 24 is a tapered circumferential surface 27 that is adapted to be engaged by the correspondingly tapered face 15 on the upper portion of tubular member 12.

When my improved safety releasing joint is located in a drill line for use the pin 18 on the lower end of the sub 16 is screwed into the upper end of the stem of the drill or fishing tool and the nut 25 having the left hand thread is screwed into the correspondingly threaded recess 22 in the upper end of the sub.

The externally threaded tubular member 12 is now screwed into the internally threaded chamber within the sub and just before the tubular member 12 reaches the limit of its movement into the sub, the tapered face 15 at the upper end of the tubular member 12 engages the correspondingly tapered face 17 in the upper portion of nut 25, thereby producing sufficient friction to pick up the nut and cause it to rotate a short distance toward the right hand end of the tubular member 12, and as the ring or collar 24 that depends from

the nut engages in the upper end of the sub 16 with a left hand thread, the nut during this rotary motion will be unscrewed to a slight degree from the sub and consequently moved upward so that the upper flat surface 26 of the nut will bear against the shoulder 14 on the under face of the head 10 and as the parts are tightened the joint friction between the threaded tube 12 and the sub 16 will be practically eliminated and the friction will be transferred to the engaging faces 14 and 26.

Thus when it becomes necessary to break or disconnect the joint in the drill line, and the latter is reversely rotated or rotated toward the left hand, the threaded tubular member 12 will, due to lack of joint friction between its threads and the threads within the sub 16, readily withdraw from the sub and thus bring about the break or disconnection at the desired point, rather than at a joint in the intermediate or upper portion of the drill tube.

In actual practice the clearance between the upper and lower face of the nut and the faces of the head 10 and upper end of the hub 16 is very slight. As a matter of fact it is but a few thousandths of an inch, so that the rotary motion imparted to the nut during the final tightening movement of the tubular member is comparatively slight and such movement only relieves the joint friction between the threads 13 and the threads on the inner face of the chamber within the sub.

In Fig. 4 I have illustrated a modified arrangement of packing between the sub and the tubular member 12 that enters said sub, and which arrangement contemplates the location of a suitable packing ring 28 in a circular groove 29, the latter being formed in the upper face of the sub.

In Fig. 5 I have shown the under face of the body portion of nut 25 and the upper face of the sub 16 around the chamber 22 cut away so as to form between them a chamber that is V or dove-tail in shape in cross section and when the parts are assembled a packing ring 30 of corresponding shape is positioned in this chamber so as to produce a fluid pressure tight joint.

While I have shown and described the tubular member 12 as being provided with right hand threads and the ring or collar 24 on the nut with a left hand thread, it is obvious that this arrangement may be reversed, and where such reverse arrangement is employed rotary motion of the drill line toward the left hand or anti-clockwise will screw the tubular member 12 into the sub and at the end of such operation the nut will be picked up and slightly unscrewed so as to engage the under face of the body 10 and eliminate the joint friction between the externally threaded tubular member and the sub in which it is screw seated.

Thus it will be seen that I have provided a safety releasing joint for the drill tubes of deep well drilling rigs, and which joint may be advantageously employed during drilling operations, and particularly for disconnecting the lower end of the drilling line from the shank of the drill or fishing tool that is connected to the lower end of said line.

It will be understood that minor changes in the size, form and construction of the various parts of my improved safety releasing joint for drill tubes may be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. In a safety releasing joint for drill tubes, an externally threaded member, a sub having an internal thread adapted to receive the external thread of said member, a nut screw seated within the upper portion of said sub, the threads between said nut and sub and between said sub and said member being oppositely arranged, and said nut being provided with a face that is adapted to frictionally engage a face on the externally threaded member when the same is screwed into said sub.

2. In a safety releasing joint for drill tubes, an internally threaded sub, an externally threaded member adapted to be screwed into said sub, a nut adapted to be screwed into said sub, the thread on which sub is reversely arranged with respect to the thread between said sub and threaded member, and cooperating faces on said nut and the member that is screwed into said sub for producing friction between said parts when said member is screwed into the sub.

3. In a safety releasing joint for drilling tubes, an externally threaded member, an internally threaded sub adapted to receive said externally threaded member, a nut screw seated in the upper portion of said sub, the threaded portion between said nut and sub and between said sub and externally threaded member being oppositely arranged, said nut and externally threaded member having cooperating faces that frictionally engage each other when the externally threaded member is screwed into the sub, and a packing member arranged between the inserted end of said threaded member and said sub.

4. In a safety releasing joint for drill tubes, an internally threaded sub, an externally threaded tubular member adapted to be screwed into said sub, a nut screw seated in said sub, cooperating conical faces on said nut and said externally threaded member which conical cooperating faces frictionally engage so as to cause the nut to rotate with said member as the latter is screwed to the limit of its movement into said sub, the threads on the externally threaded member

and nut being reversely arranged, and means for rendering said joint leak-proof when assembled for use.

5. In a safety releasing joint for drill tubes, a sub, a tubular member having threaded engagement with said sub and having a cone shaped engaging shoulder, a nut having a cone shaped engaging surface adapted to have frictional engagement with the cone shaped shoulder of said tubular member and having threaded engagement with said sub, the threads on said nut and said tubular member being reversely arranged whereby said nut is unscrewed from said sub and moved into frictional engagement with said tubular member as the latter is screwed into said sub.

In testimony whereof I affix my signature.
MAX L. VALLENDOR.

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