Jan. 3, 1956 J. F. NORTHROP 2,729,245

PNEUMATICALLY ACTUATED THREAD PROTECTOR

Filed April 5, 1954 2 Sheets-Sheet 1

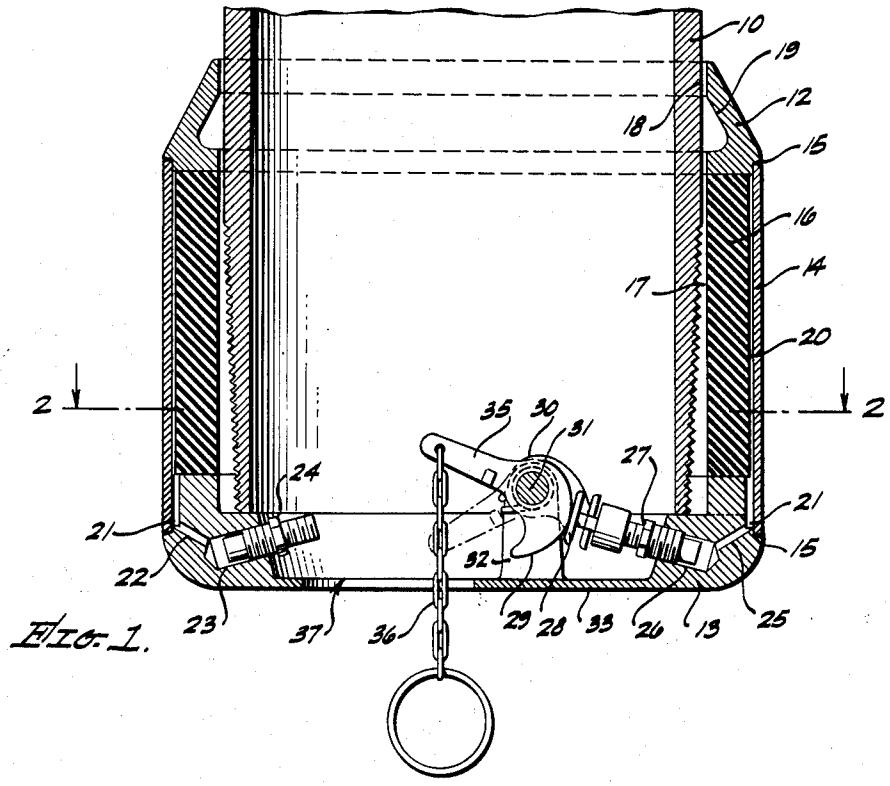


FIG. 1.

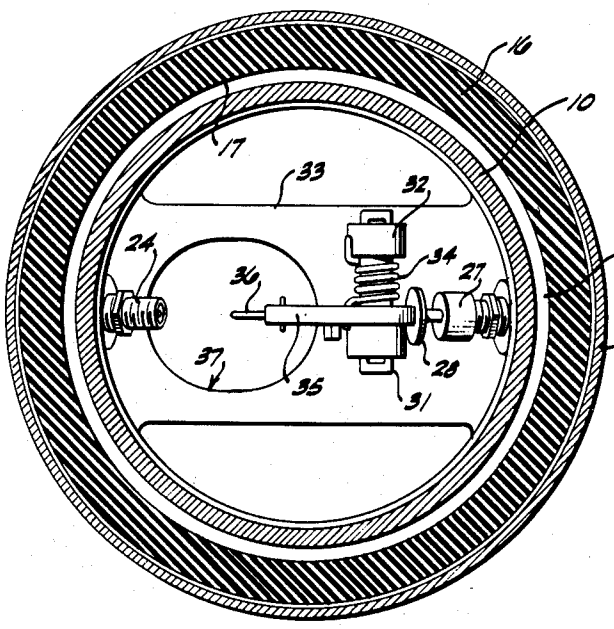


FIG. 2.

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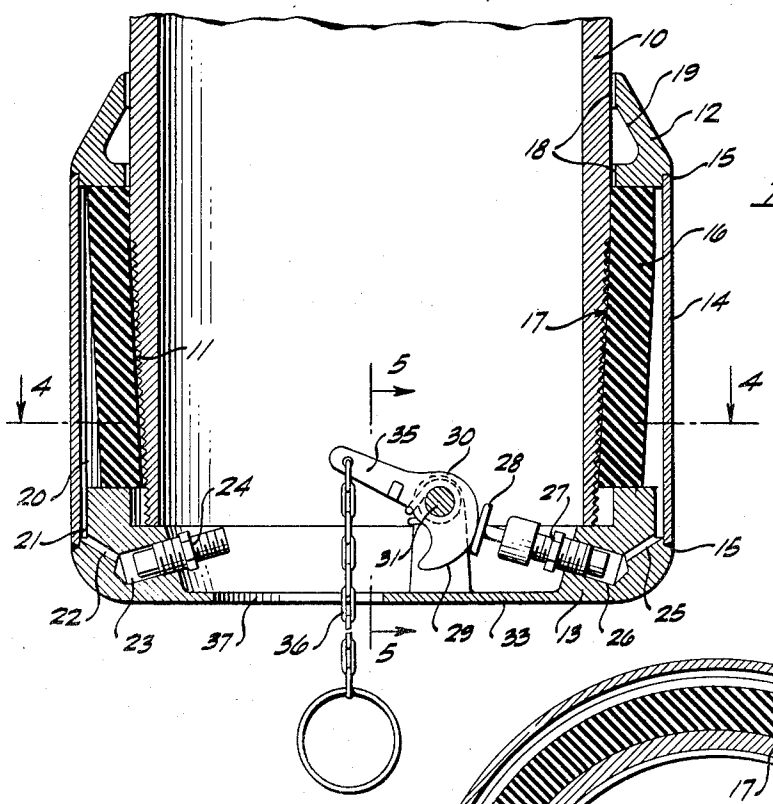


FIG. 3.

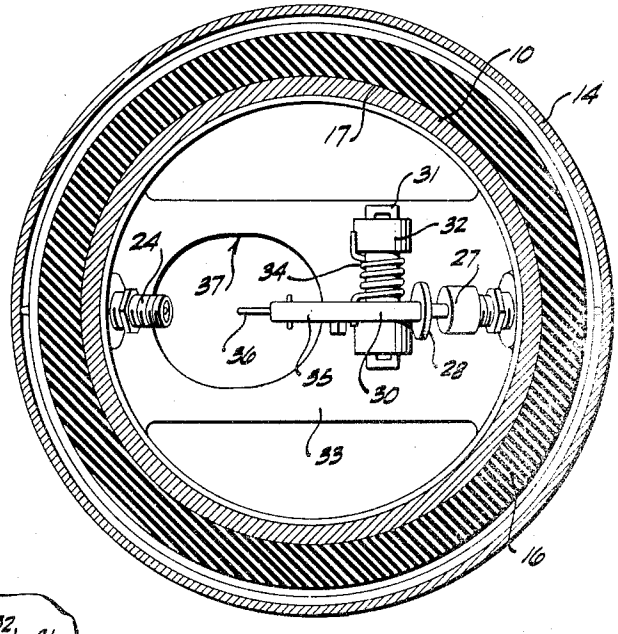


FIG. 4.

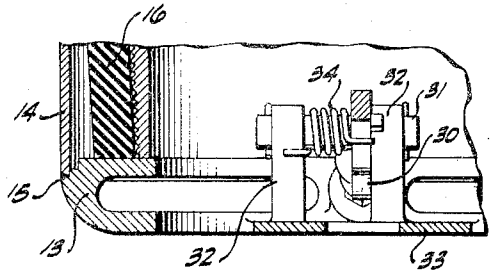


FIG. 5.

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PNEUMATICALLY ACTUATED THREAD PROTECTOR

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Application April 5, 1954, Serial No. 421,105

3 Claims. (Cl. 138—96)

This invention relates to a pneumatically actuated pipe thread protector, whereby the threads of a stand of pipe are covered and prevented from striking adjacent objects while the pipe is being moved from one place to another, such as in the drilling or production of an oil well where the pipe is moved from a rack to the bore of the well, or the like.

An object of my invention is to provide a novel pneumatically actuated pipe thread protector whereby a movable annulus or shield surrounds the threaded portion of the pipe, and this annulus is pressed inwardly against the pipe threads by pneumatic pressure.

Another object of my invention is to provide a novel pipe thread protector of the character stated, in which a flexible annulus or shield is mounted within a metal housing and is caused to move inwardly and outwardly within this housing to engage and disengage the threaded portion of the pipe as pneumatic pressure is exerted against the annulus, or exhausted from behind the same, thus mounting the thread protector as well as releasing the same from the pipe.

Another object of my invention is to provide a novel thread protector of the character stated in which a flexible annulus, which may be made of rubber or plastic, is so mounted within a metal housing that the annulus may slide inwardly or outwardly within the housing to engage and disengage the threads of a pipe, the annulus being sealed against shoulders in the housing by the expansion of the annulus when under pneumatic pressure.

Still another object of my invention is to provide a novel pipe thread protector of the character stated, which is simple in construction, inexpensive to manufacture, and effective in use.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

In the drawing:

Figure 1 is a transverse sectional view of my pneumatically actuated pipe thread protector positioned on a pipe.

Figure 2 is a sectional view taken on line 2—2 of Fifure 1.

Figure 3 is a transverse sectional view similar to Figure 1, but showing the annulus in a position engaging the threads of the pipe.

Figure 4 is a sectional view taken on line 4—4 of Figure 3.

Figure 5 is a fragmentary sectional view taken on line 5—5 of Figure 3.

Referring more particularly to the drawing, the stand of pipe 10 is provided with threads 11 which, in this instance, are external threads, that is, these threads which are to be protected and which are prevented from being battered or otherwise injured while the pipe is moved from one place to another, for example, as when a stand of casing is moved into an oil well derrick.

My thread protector consists of an upper ring 12 and a lower ring 13. A wall 14 is fixedly attached to the rings 12 and 13 by means of the welded joints 15—15, or by

other suitable means so that a complete metallic housing is thus provided. The housing may be formed of one integral piece, however, for purposes of simplicity and construction I prefer the form as set forth above. An annulus or shield 16 is mounted within the housing and between the upper and lower rings 12 and 13, respectively, substantially as shown. The upper and lower faces of the annulus 16 fit closely against the rings 12 and 13 to enable a seal to be effected, when the annulus 16 is slightly elongated, due to the annulus being pressed against the threads 11 of the pipe 10. The inner face 17 of the annulus 16 presses against the threads 11 for the purpose of holding the outer metallic housing in position to surround and protect the threads 11. The upper ring 12 of the metal housing is formed with two vertically spaced surfaces 18 which are positioned close to the outer surface of the pipe 10, and these surfaces are connected by the inclined wall 19, which acts as a deflecting surface whenever the thread protector strikes an abutment or other obstacle.

An air space 20 is provided within the housing and back of the annulus 16. This air space extends the entire length of the annulus 16 and completely surrounds the same, so that air pressure within this space will force the annulus inwardly and press it against the threads 11, as shown in Figure 3. When the annulus is in the position shown in Figure 3 it will be slightly elongated in a vertical plane, thus pressing the top and bottom surfaces of the annulus against the rings 12 and 13 respectively, to prevent the escape of air around the top and bottom surfaces of the annulus. A groove 21 is formed in the ring 13 and on the outside thereof, and a bore 22 is drilled into this groove from the intake bore 23. A pneumatic fitting 24, of the usual valved type, is threaded into the bore 23 and air under pressure is admitted through the fitting 24. An outlet bore 25 extends from the groove 21 to an outlet 26, and a release or outlet valve 27 is threaded into the outlet 26. The valve 27 is of the quick release type, that is, when it is opened it will quickly exhaust the air from the space 20, permitting the annulus 16 to retract and thus disengage the threads 11. The release valve 27 is provided with a button 28 which, when depressed, will open this valve. The button 28 may be actuated in a number of different ways, one of which may be by means of the cam 29 which is formed on the lever 30. The lever 30 is rotatably mounted on a shaft 31 and this shaft is mounted in blocks 32—32. The blocks 32—32 rise from a web 33 which is formed on the ring 13 and is preferably integral with this ring.

The lever 30 is a spring pressed by the spring 34 to hold the lever in a position where the cam 29 is not depressing the button 28. The lever 30 may be actuated by the arm 35 and a chain 36 attached thereto. The chain 36 may extend through an appropriate hole 37 in the web 33 so that it may be grasped by the workman and pulled from outside of the thread protector, thus providing a means of quickly releasing the pressure in the chamber or air space 20 and enabling the thread protector to be removed from the pipe.

In operation the thread protector is slipped onto the threaded end of the pipe 10 with the ring 13 engaging the end of the pipe. The ring 13 thus acts as a stop. Air is then forced through the fitting 24 and thence into the air space 20. The annulus 16 is now pressed inwardly against the threads 11, as shown in Figure 3. The pressure of the air against the annulus 16 will elongate the annulus due to the fact that it is squeezed against the threads 11 and since this part is formed of rubber or plastic. This elongation presses the annulus against the rings 12 and 13 to seal the upper and lower surfaces of the annulus. The pressure of the air against the annulus 16 is sufficient to hold the outer metal housing in posi-

tion on the pipe and thus protect the threads **11** from being injured. When it is desired to remove the protector from the pipe, it is only necessary to open the valve **27** and permit the escape of air from the space **20**. This may be accomplished by manually opening the valve **27**, or this action can be accomplished from outside of the thread protector by pulling the chain **36**, thus rotating the lever **30** and causing the cam **29** thereof to engage and depress the button **28** of the valve **27**.

Having described my invention, I claim:

1. A pneumatically actuated pipe thread protector comprising an upper ring, a lower ring spaced therefrom and a wall connecting said rings, said rings and wall defining a housing, an annulus mounted in said housing between said upper and lower rings and with the inner face of the annulus exposed to the threads of the pipe, said housing having an air space therein defined by the outer surface of the annulus, said wall and the upper and lower rings, an air intake fitting extending into said air space, and a release valve extending into the air space.

2. A pneumatically actuated pipe thread protector comprising an upper ring, a lower ring spaced therefrom and a wall connecting said rings, said rings and wall defining a housing, an annulus mounted in said housing between said upper and lower rings, said upper and lower rings defining shoulders against which the upper and lower surfaces of the annulus bear and with the inner face of the annulus exposed to the threads of the pipe, said housing having an air space therein defined by the outer surface of the annulus, said wall and the upper and lower rings, an air intake fitting extending into said air space, and a release valve extending into the air space.

3. A pneumatically actuated pipe thread protector comprising an upper ring, a lower ring spaced therefrom and a wall connecting said rings, said rings and wall defining a housing, an annulus mounted in said housing between said upper and lower rings, said upper and lower rings defining shoulders against which the upper and lower surfaces of the annulus bear and with the inner face of the annulus exposed to the threads of the pipe, said housing having an air space therein defined by the outer surface of the annulus, said wall and the upper and lower rings, an air intake fitting extending into said air space, and a release valve extending into the air space, said annulus being slidable laterally of the housing on said shoulders as the inner surface of said annulus engages and disengages the threads of the pipe.

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