June 16, 1936. C. E. BURT 2,044,057

TRAP RING FOR CORE BARRELS

Filed March 11, 1935

Fig. 1.

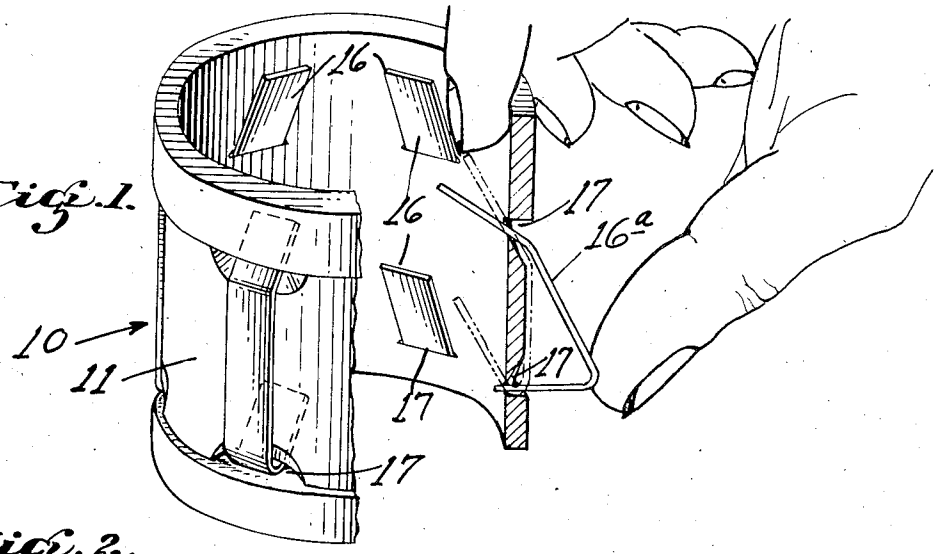


Fig. 2.

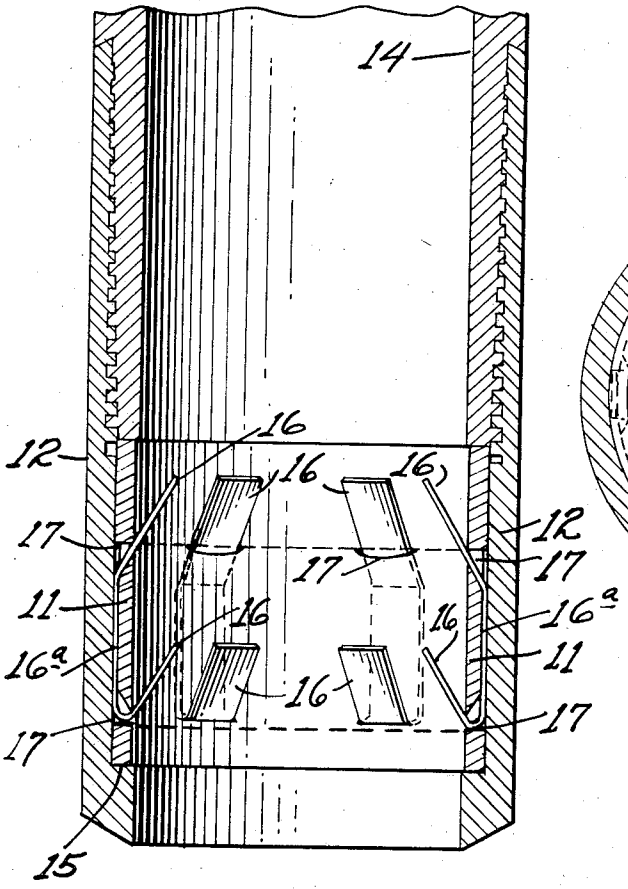
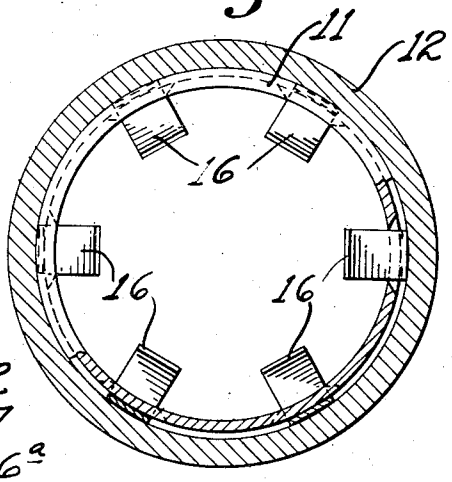


Fig. 3.



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TRAP RING FOR CORE BARRELS

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2 Claims. (Cl. 255—72)

This invention relates to core drills for taking cores during the sinking of oil well bores and particularly pertains to a trap ring for such apparatus to maintain the core in the core tube while the latter is pulled from the bore.

Practically all core barrels in use in the oil fields are fitted with a trap ring or equivalent device which is usually located adjacent the lower end of the core tube which receives the core. This trap ring or equivalent device permits the core to enter the core tube but prevents it dropping from the lower end thereof when the core barrel is pulled from the hole. One of the most commonly used devices for this purpose consists of a sleeve removably fitting within the lower end of the core tube. This sleeve is fitted with spring fingers extending upwardly and inwardly toward the center of the sleeve so that they will permit entrance of the core but will be effective in preventing the same from dropping from the tube when the core barrel is pulled from the hole.

In this device the spring fingers are usually welded to the sleeve and when they are broken off (which is frequently the case) the entire trap ring must be replaced and returned to the shop for repairs. This results in inefficiency and frequent delays in the running of the core barrel.

It is the principal object of my invention to provide an improved device of the character described of simple and inexpensive construction and in which the spring fingers may be expeditiously replaced.

The invention is exemplified in the following description and illustrated by way of example in the accompanying drawing in which:

Fig. 1 is a perspective view of a device embodying the preferred form of my invention, partially broken away to disclose the manner in which the spring fingers are replaced.

Fig. 2 is a certain vertical sectional view through the lower end of a core tube showing my improved device fitted thereto.

Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 2.

Referring more particularly to the accompanying drawing, 10 indicates a trap ring for use in core barrels to trap the core in the core tube thereof. This device consists of a sleeve or cylinder 11 adapted to fit within the trimmer shoe 12 of a core tube 14. It will be noticed that the sleeve 11 snugly fits the bore of the trimmer shoe 12 and that when the latter is threaded on to the core tube 14 the sleeve 11 is held between the interior annular shoulder 15 on the trimmer shoe 12 and the lower extremity of the core tube 14. By unscrewing the trimmer shoe 12 for the core tube 14 the sleeve 11 may be slipped out of the trimmer shoe 12.

The sleeve 11 is fitted with a plurality of spring fingers 16 which project radially inwardly from its inner periphery and upwardly as illustrated. These fingers 16 are arranged in sets of two fingers which are vertically spaced apart in vertical alignment. The sets of fingers are spaced equal distances apart circumferentially of the sleeve.

These fingers 16 are of flat spring material such as spring steel so that they will yield in a radially outward direction when a core is forced upwardly through the sleeve and permit the same to freely pass upwardly into the core tube. However, should the core attempt to move downwardly out of the core tube 14, the upper ends of the fingers 16 tend to move radially inward and penetrate into the core and prevent such movement. This traps the core in the tube 14 so that it may be removed from the bore with the core barrel.

After the barrel has been pulled from the well bore, the sleeve is removed by removing the trimmer shoe 12 from the core tube 12 which enables the core to be removed from the core tube 14.

The essence of the present invention resides in the construction of the spring fingers 16 and the manner of connecting them with the sleeve 11. From the drawing it will be seen that the spring fingers 16 of each set are formed from the same strip of material. That is, each set of spring fingers 16 is formed of a flat strip of material with its ends bent at an angle thereto in parallel relation to form the fingers 16. The intermediate section 16a of the strip between the fingers remains straight as illustrated. The angular relation of the fingers 16 to the connection portion 16a therebetween is such that when the latter is arranged vertically against the exterior surface of the sleeve 11 the fingers 16 will project inwardly and upwardly relative to the axis of the sleeve at the proper angle.

To provide a connection between the finger sets and the sleeve, the latter is formed with sets of slots 17 through its wall which are spaced equal distances apart circumferentially about the sleeve 11. The vertical spacing between the slots of each set is approximately the distance between the fingers 16 of each finger set so that the fingers 16 of each set may be projected through the slots with the intermediate portion 16a lying flatly against the outer periphery of the sleeve 11. To permit such insertion, due to the angular disposition of the fingers 16, the lower edges of the

slots are beveled at the exterior of the sleeve as illustrated.

To accommodate the intermediate portion 16a of the finger sets, the exterior of the sleeve between the slots is reduced in diameter an amount agreeing with the thickness of the intermediate portion 16a. The portions of the sleeves between the slots 17 and the extremities of the sleeve are of an external diameter just slightly less than the bore of the trimmer shoe 12.

When the sleeve 11 with the finger sets are mounted in the shoe 11 the intermediate portions 16a of the finger sets will be secured between the exterior periphery of the sleeve 11 and the inner periphery of the shoe 12 as disclosed in Fig. 2.

In operation the sleeve 11 is constructed as illustrated and described and the finger sets are assembled thereon by inserting the fingers of each set through the proper slots 17 as illustrated in Fig. 1 and pressing the intermediate portion 16a of each set into contact with the exterior of the sleeve 11. There is sufficient frictional engagement between the fingers 16 and the edges of the slots 17 to hold the finger sets assembled on the sleeve 11.

The sleeve is then slipped into the trimmer shoe 12 and the latter is threaded onto the core tube 14. As the core passes upwardly through the trimmer shoe 12 and the trap ring 10, the fingers 16 will yield radially outward permitting the core to pass into the core tube 14. When the core tube 14 is elevated and the core tends to drop out of it, the downward movement of the core causes the free ends of the fingers 16 to tend to penetrate into the core and move radially inward and thus trap the core in the core tube 14.

When the core barrel has been pulled from the hole, the trimmer shoe 12 is removed from the tube 14 together with the trap ring 10 and the core is then removed from the tube 14. Should any of the fingers 16 be broken, it is only necessary to detach it from the sleeve and assemble a new one on the sleeve in its place as indicated in Fig. 1. This can be done very expeditiously and without any appreciable loss of time.

It is obvious from the foregoing that I have provided a very simple and efficient trap ring for core barrels which is not only inexpensive to manufacture but which permits the vulnerable parts thereof to be quickly replaced when broken or destroyed.

While I have disclosed the preferred form of my invention, it is to be understood that various changes may be made therein by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In combination with a tubular core-taking device, a sleeve-like member fitting therewithin and held from axial movement with respect thereto, said sleeve-like member having openings formed through its side wall, members having portions to be interposed between the exterior of said sleeve-like member and the interior of the core-taking device, said members having flexible portions projecting through said openings in said sleeve-like member and extending radially inwardly and upwardly with respect to said core-taking device.

2. A device of the character described comprising a sleeve-like member adapted to fit within a tubular core-taking device, said sleeve-like member being formed with pairs of openings spaced equal distances apart about the periphery thereof, a member for each pair of openings, such member comprising a portion to lie vertically along the exterior of said sleeve-like member, the ends of said member being bent inwardly and upwardly with respect to said sleeve-like member and projecting through said sockets, said ends being flexible.

CLARENCE E. BURT.