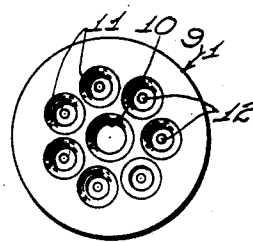
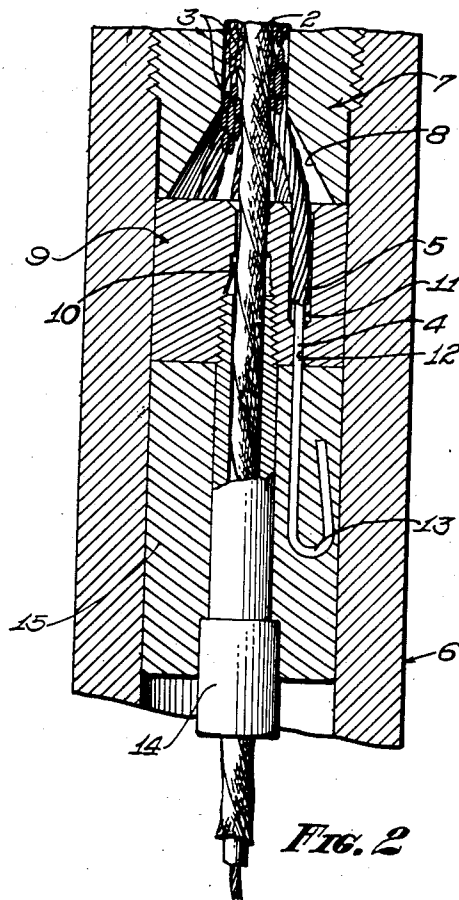
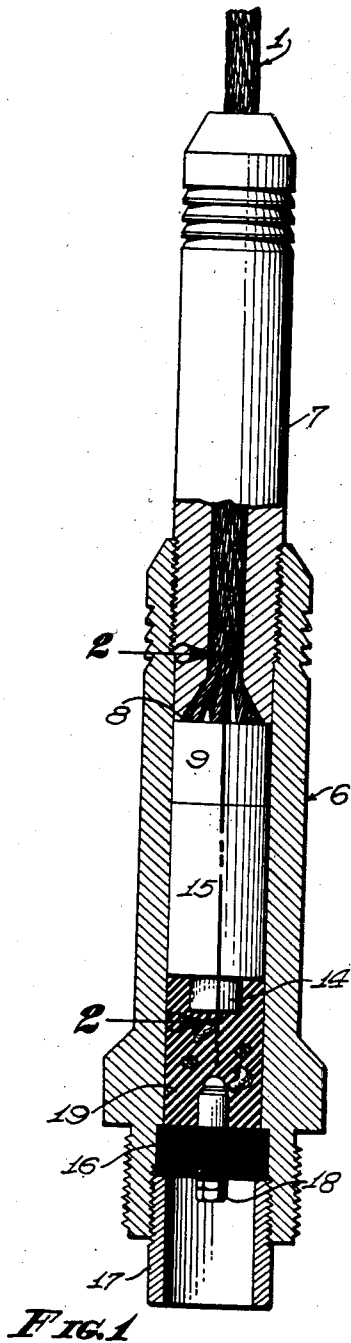


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A. C. H. COOKE
RELEASABLE CABLE HEAD

2,266,357

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RELEASABLE CABLE HEAD

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3 Claims. (Cl. 24-115)

My invention relates to releasable cable heads, and among the objects of my invention are:

First, to provide a releasable cable head which is particularly designed for conductor core wire ropes used to support and supply electricity to oil well tools such as gun perforators;

Second, to provide a releasable cable head which is adapted to be lowered to great depths in liquid-filled well bores and which is so arranged that should the tool to which it is connected become lodged in the well bore, a predetermined tension calculated to pull the cable from the cable head may be applied thereon, such tension being substantially below the safety factor of the cable itself so that the cable is in no way damaged;

Third, to provide a releasable cable head which is particularly satisfactory for releasing a cable from a gun perforator that has become sanded in a well bore, inasmuch as only the cable itself is retrieved without any enlargement at its lower end so that the cable may be readily drawn upward through the sand that may be packed above the gun and around the cable;

Fourth, to provide a releasable cable head which is particularly easy to fasten to an electrical conductor cable for the use of simple tools so that the operation may be accomplished in the field;

Fifth, to provide a releasable cable head which, although assembled on a cable in the field, may be depended upon to release within very close proximity to the predetermined releasing tension and which may be used repeatedly without deteriorating or tending to pull loose under a load less than the predetermined tension; and

Sixth, to provide a cable head which is an improvement on Patent 2,043,341.

With the above and other objects in view, as may appear hereinafter, reference is directed to the accompanying drawings, in which:

Figure 1 is a longitudinal partial sectional, partial elevational view of my releasable cable head;

Figure 2 is an enlarged fragmentary, longitudinal sectional view through 2-2 of Figure 1; and

Figure 3 is a plan or end view of the strand dividing head.

The cable 1 or wire rope with which my releasable cable head is adapted to be used is of the hauling or hoisting type with a conductor core 2 substituted for the usual hemp core. Around the core is provided a plurality of multiple wire strands 3. Each multiple wire strand comprises a central king wire, around which is

twisted other wires 5. The cable is preferably of the "preformed" type.

The cable head comprises a case 6 having relatively heavy walls and a substantially uniform bore. One end of the bore is threaded to receive the threaded end of a sleeve 7. The sleeve 7 has a bore approximating the diameter of the cable 1, which bore is flared at the lower or inner end of the sleeve, as indicated by 8. The case and sleeve form a housing and the inner end of the sleeve forms an abutment.

A spreader plug 9 in the form of a cylindrical block is adapted to fit within the bore of the case 6 and bear against the inner end of the sleeve 7. The spreader plug 9 is provided with a central core-receiving bore 10, around which are drilled a plurality of strand-receiving bores 11, one for each strand 3. The inner end of each strand-receiving bore is reduced in diameter to form a king wire bore 12.

The several strands 3 of the cable are unwound to expose a length of core 2 and the several planetary wires 5 surrounding each king wire are peeled back and cut off so that each of the king wires 4 is exposed. Care is exercised in removing the wires 5 to prevent scratching or nicking the king wires, and the exposed ends of the king wires are doubled back against themselves to form loops 13, this being done over a smooth, rounded tool so that no nicks or other sources of stress concentration are formed. Before looping the king wires the strands 3 are inserted in the bores 11 and the king wires are thrust through the bores 12. Also, the core 2 is extended through the bore 10. Naturally, the operations previously described are performed after the cable has been extended through the sleeve 7 and case 6.

The core-receiving bore 10 is threaded to accommodate a core-receiving tube 14 which extends in the same direction as the loop ends of the king wire. After the cable has thus been joined to the spreader plug or block 9 the spreader block is drawn into the case 6 until it seats against the inner end of the sleeve 7. The flared end 8 of the bore through the sleeve forms a chamber whereby the several strands may spread from the normal diameter of the cable to the axes of the several strand-receiving bores 11.

After the plug is in place a predetermined quantity of zinc or other relatively soft material is melted and poured around the core-receiving tube 14, so as to completely cover the looped end 13 of the king wires. The zinc or

similar material, when hardened, forms an anchor plug 15.

The extended end of the case 6 is enlarged slightly and internally threaded to form a shoulder for receiving a terminal disc 16 and a threaded retainer nipple 17. The terminal disc is provided with a terminal 18 extending there-through for electrical connection to whatever tool is attached to the case 6, while the inner end is attached to the conductor within the core 2. An extra length of the core is provided, which is coiled in the space between the terminal disc 16 and the anchor plug 15. Before positioning the terminal disc this space is completely filled with an insulating compound 19, the compound being poured in while in a molten state. When the compound is hardened the space above the terminal disc is completely filled with solid so that neither the anchor plug 15 nor spreader plug 9 can move inwardly by reason of excessive external pressure exerted by the liquid in which the cable is immersed.

By reason of the spreader plug or block 9, and the anchor plug 15, the several king wires are held in such a manner that the full combined tensile strength of the several king wires must be exceeded before the cable 1 can be withdrawn. This "pull out" force, however, is materially less than the safe load on the cable by reason of the fact that only the king wires are embedded, the other wires 5 being entirely free. It is important, not only that the king wires alone be attached so that the releasing tension will be less than that of the safe tensile load on the cable, but also that the releasing tension be uniform and predictable. Tests have shown that the manner in which the king wires are supported and guided by the spreader plug or block is such that a very uniform pull-out or releasing tension is assured. Furthermore, by reason of the fact that the strands 3 fully protect the king wires, particularly within the chamber 8, although the cable head is used repeatedly the king wires do not become damaged and fail at a lower point than the desired "pull out" load.

Various changes and alternate arrangements may be made within the scope of the appended claims, in which it is my intention to claim all novelty inherent in the invention as broadly as the prior art permits.

I claim:

1. The combination with a multiple stranded wire rope wherein each strand includes a king wire and several planetary wires wound there-around the king wire extending beyond its planetary wires, of a load-limiting wire rope head comprising: a housing having a bore adapted to receive the wire rope and a counterbore continuing from said bore and forming therewith an abutment; a spreader block adapted to bear

against said abutment and having guide holes therethrough to accommodate said king wires only; and means for anchoring the protruding ends of said king wires; said guide holes being arranged to protect said king wires against all but tensile strains whereby the full tensile strength of the king wires may be developed, said king wires constituting the sole connection between said wire rope and said head, whereby said wire rope releases from said head when the combined tensile strength of said king wires is exceeded.

2. The combination with a multiple stranded wire rope wherein each strand includes a king wire and several planetary wires wound there-around said king wires extending beyond said planetary wires, of a load-limiting wire rope head comprising: a housing having a bore adapted to receive the wire rope and a counterbore continuing from said bore and forming therewith an abutment; a spreader block adapted to bear against said abutment, said spreader block having sockets adapted to receive said strands, and guide holes continuing axially from said sockets and adapted to receive the extended portions of said king wires; and a molded anchor covering the protruding ends of said king wires; said king wires being held in coaxial relationship with their respective strands and said king wires continuing axially into said anchor, whereby said king wires are adapted to develop their full tensile strength before giving way, said king wires constituting the sole connection with said head.

3. The combination with a multiple stranded wire rope wherein each strand includes a king wire and several planetary wires wound there-around said king wires extending beyond said planetary wires, of a load-limiting wire rope head comprising: a housing having a bore adapted to receive snugly the entire cable and flaring into an enlarged counterbore, there being formed, however, a peripheral abutment; a spreader block adapted to bear against said abutment, said spreader block having sockets adapted to receive said strands, and guide holes continuing axially from said sockets and adapted to receive the extended portions of said king wires; a molded anchor covering the protruding ends of said king wires; said king wires being protected by their planetary wires throughout the flared portion of said wire rope-receiving bore and said sockets; said king wires being held in coaxial relationship with their respective strands by said guide holes and said king wires continuing axially into said anchor, whereby said king wires are adapted to develop their full tensile strength before giving way and releasing said head.

ARTHUR C. H. COOKE.