

(12) **UK Patent Application** (19) **GB** (11) **2 200 674 A** (13)
 (43) Application published 10 Aug 1988

(21) Application No 8701941

(22) Date of filing 29 Jan 1987

(71) Applicant
Terence Robert Morrell
 15 Floral Farm, Canford Magna, Wimbourne,
 Dorset

(72) Inventor
Terence Robert Morrell

(74) Agent and/or Address for Service
Gill Jennings & Every
 53-64 Chancery Lane, London, WC2A 1HN

(51) INT CL⁴
E21B 23/00

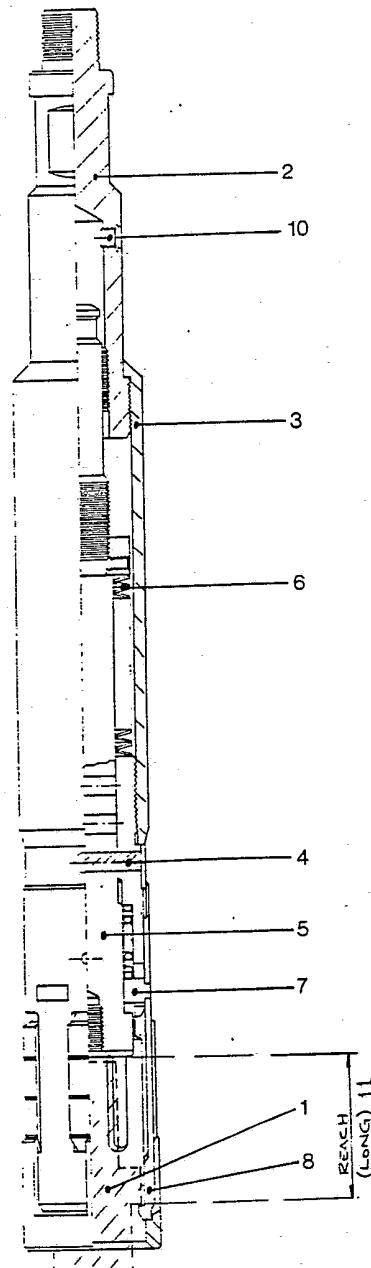
(52) Domestic classification (Edition J):
E1F KU

(56) Documents cited
EP 0187408

(58) Field of search
E1F
Selected US specifications from IPC sub-class
E21B

(54) **Universal wireline running and pulling tool**

(57) A universal wireline running and pulling tool is used by the wireline industry for the purpose of either retrieving or setting sub-surface devices within a well bore. The universal tool is provided so that the same tool can be used, without the use of additional parts, to release from a sub-surface device by either an upward hammer action, or by selection, a downward hammer action. The universal tool can also be adjusted to allow for varying lengths of latch profile on the sub-surface device (or reach). The wireline tool includes an upper sub 2, outer body 3, core 5 and shear pin 4. When set for release by a downward hammer action (Fig. 1) outer body 3 is threaded onto upper sub 2 and core 5 is released from sub 2. When set for release by an upward hammer action core 5 is threaded to sub 2 and outer body 3 is released from sub. The length of the latch profile can be varied by inserting the shear pin 4 in a selected one of a series of holes in the core 5.



GB 2 200 674 A

FIG. 1 OF 4

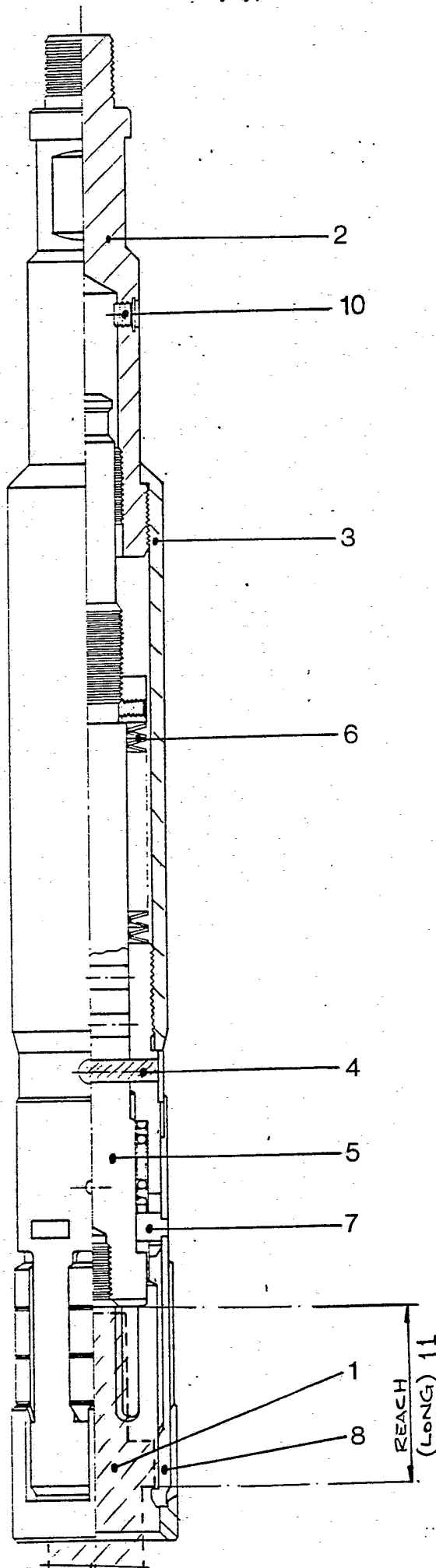


FIG. 2 OF 4

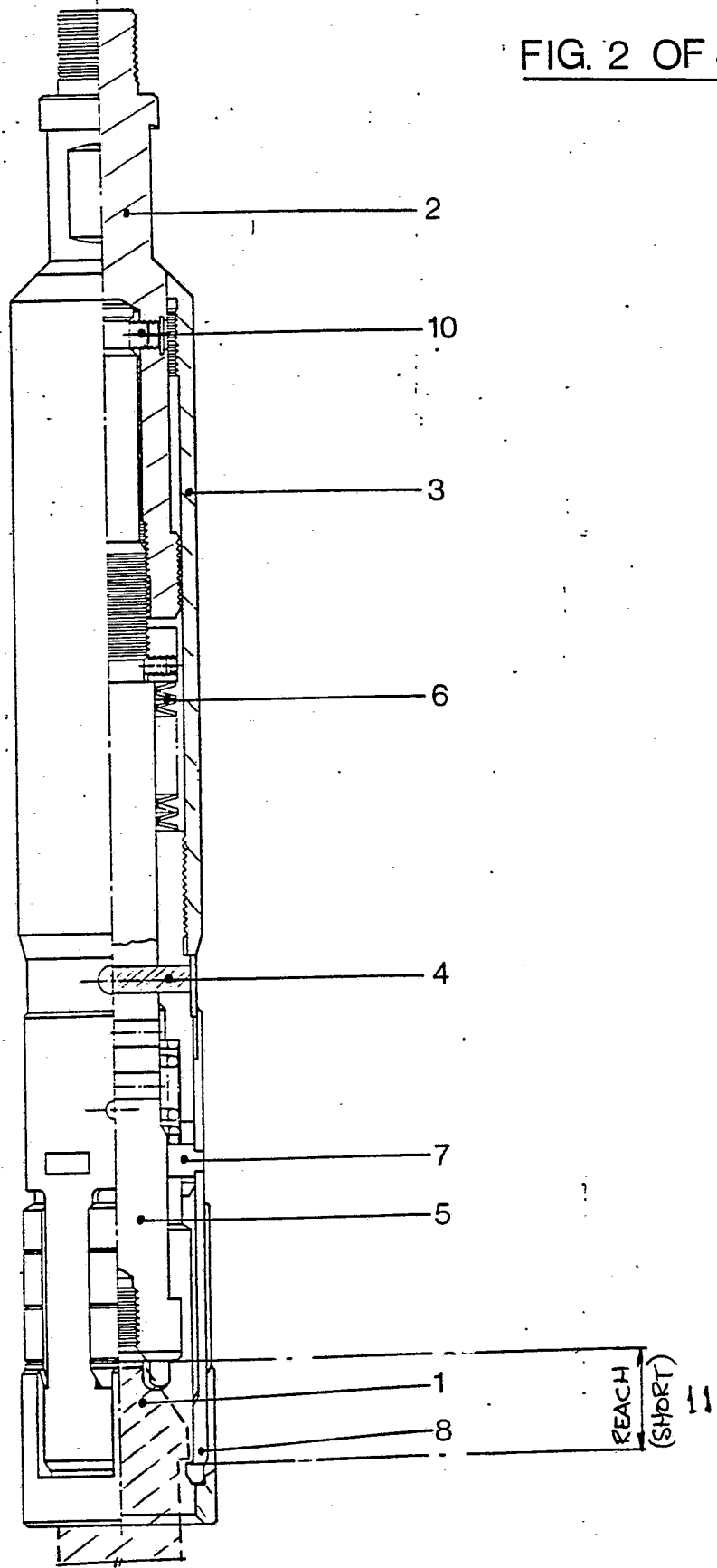


FIG. 3 OF 4

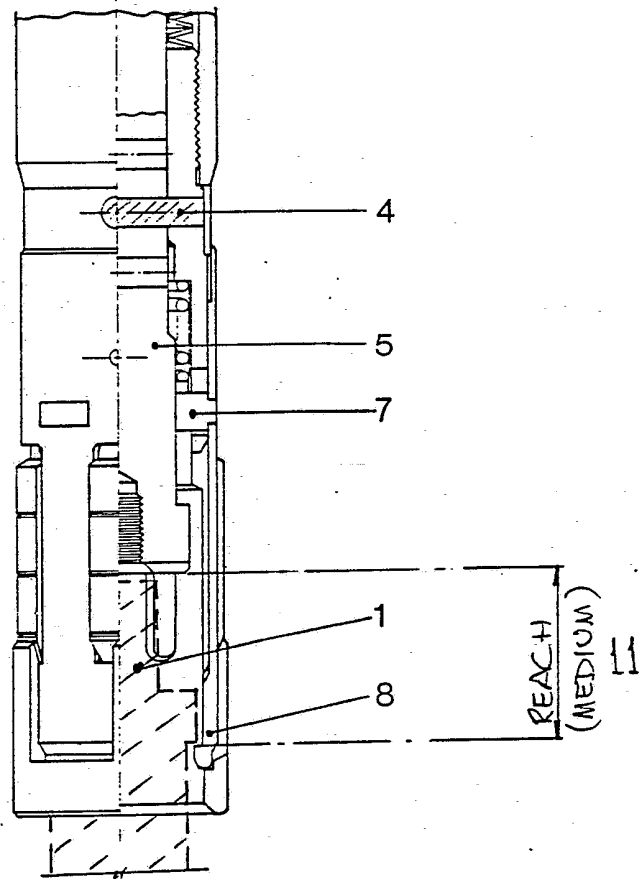
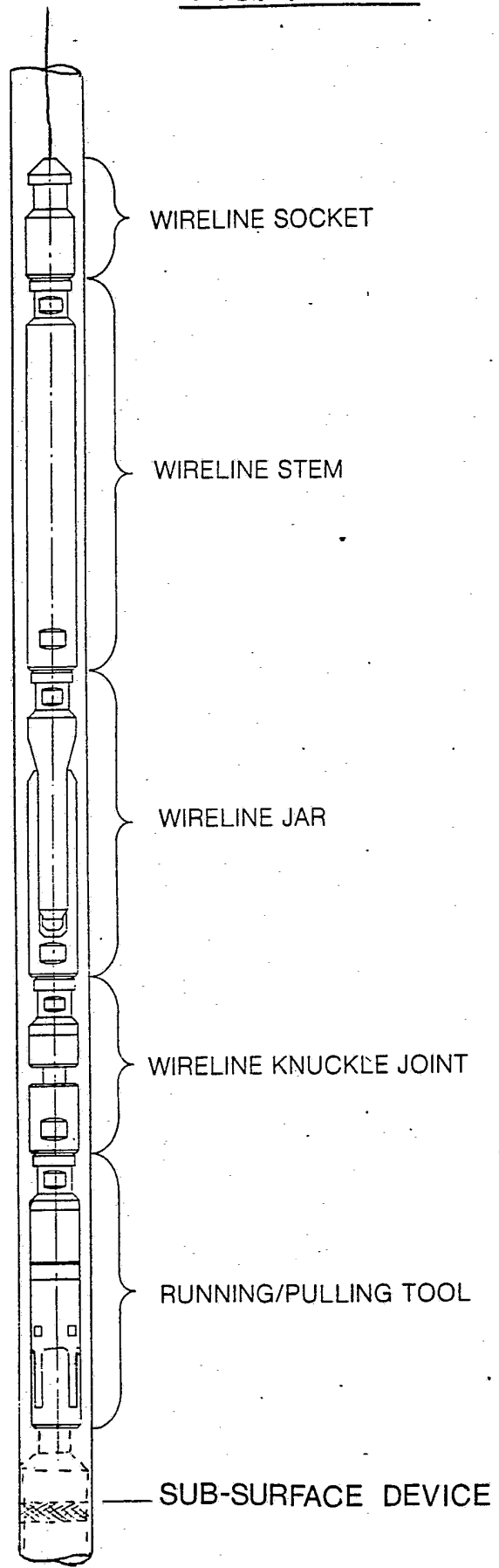


FIG. 4 OF 4



UNIVERSAL WIRELINE RUNNING AND PULLING TOOL

This invention relates to a wireline tool for use within the Oil, Gas, Water and Geothermal wireline industry.

The wireline running and pulling tool is used to either set or retrieve sub-surface devices from the well bore, and has, for any given diameter, two main features.

Firstly, that when a wireline running or pulling tool is attached to a sub-surface device it is necessary, for either operational reasons or safety reasons, to be able to release from the sub-surface device. Depending on the type of sub-surface device, the release mechanism has to be operated by applying a hammer action in the opposite direction to that in which the tool is designed to normally operate. Thus providing a requirement for a tool with an upward hammer action to release and a tool with a downward hammer action to release.

Secondly, a sub-surface device can have varying lengths on its latch profile, creating the necessity for the running and pulling tool to accommodate these various lengths (or reach). Typically three or more different cores are provided on each tool to accommodate the varying lengths of the latch profile on the sub-surface device.

According to the invention we provide one tool, for any given diameter, which can be simply adjusted without the need for additional parts to provide an upward or downward releasing system and the provision of a core that can be adjusted for length of reach.

In order that the invention can be fully understood it will be described by the accompanying drawings of the construction and embodiment of the invention.

Fig 1: shows the universal tool in the downward release mode with the core in a long reach position.

Fig 2: shows the universal tool in the upward release mode with the core in a short reach position.

Fig 3: shows, in part, the universal tool in either the upward release mode or the downward release mode with the core in a mid reach position.

Fig 4: shows (for reference only) a conventional assembly of wireline tools connected to the wireline and used to deliver surface controlled impacts (hammer action) either upwards or downwards to manipulate sub-surface devices within the well bore.

Referring to the drawing Figure 1, shows the universal tool in the downward hammer to release mode, where the tool can be released from a sub-surface device by downward hammer action. This is achieved when the universal tool is attached to a conventional tool string (Figure 4) to the threaded top sub (2, Figure 1). A downward hammer force is then transmitted via the outer body (3) to the shear pin (4). An equal and opposite upward force being applied via the sub-surface device (1) through the core (5) to the shear pin (4), causes the pin (4) to shear. This will release the energy in the main spring (6) and drive the core (5) upwards. As the core (5) moves upwards, its lower shoulder engages the base of the pawls (7). As the pawls (7) move upwards they in turn pull the dogs (8) upwards. As the dogs (8) move upwards along an inclined surface in the vertical opening of the outer body (3), they move outwards releasing the lugs on the dogs (8) from the sub-surface device (1) thus allowing the tool to release from the sub-surface device (1).

The same tool can be used to release in an upward hammer action also.

This is achieved (refer Figure 1 & 2) by releasing the thread at the lower end of the top sub (2) and outer body (3), and re-engaging the inner thread at the lower end of the top sub (2) onto a mating thread on the top of the core (5) and locking in place (10).

Hence (refer Figure 2) when the universal tool is latched to a sub-surface device (1) an upward hammer force imposed on the top sub (2) is transmitted via the core (5) to the shear pin (4). With the restriction of movement of the dogs (8) by the sub-surface device (1) the dogs (8) bottom within the outer body (3). The shear pin (4) which pins the core (5) to the outer body (3) will shear. This will release the energy of the main spring (6) and cause the core (5) and the top sub (2) to move upwards. As the core (5) moves upwards the lower shoulder of the core (5) engages the base of the pawls (7) pushing the pawls (7) upwards. They in turn pull the dogs (8) upwards. As the dogs (8) move upwards along an inclined surface in the vertical opening of the outer body (3) the dogs (8) move outwards releasing the lugs on the dogs (8) from the sub-surface device (1), thus allowing the tool to be free of the sub-surface device (1).

In order to provide the tool with the variable reach (Figure 1, 2 & 3 (11)), pre-drilled holes in the core (5) enable the operative to determine the tool reach required.

CLAIMS

- 1). A single Universal Wireline Running & Pulling tool, for any given diameter can be converted from an upward release tool to a downward release tool, without the use of additional parts and that the reach of the tool is adjustable by utilising pre-drilled holes in the core of the tool.
- 2). A Universal Wireline Running and Pulling Tool constructed substantially as described herein with reference to and as illustrated in the accompanying drawings.