



New connection on: : 01-11-2018 : 04:44:29 - Last disconnection on: : 01-11-2018 : 04:42:09

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

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[EPODOC: SS 8] ..fiepodoc

 Database: EPODOC

[EPODOC: SS 8] E21B33/C/LOW

Results in EPODOC 55.797

[SS 9] * and hanger and pipe

Results in EPODOC 182

[SS 10] * and groove

Results in EPODOC 20

[SS 11] * and seal+

Results in EPODOC 10

[SS 12] ..li



1/10 © EPODOC / EPO

PN - [US4042020](#) A 19770816

PR - US19760660396 19760223

AP - US19760660396 19760223

DT - *

CT - [US2343235](#) A []; [US2689611](#) A [];
[US2918972](#) A []; [US2946385](#) A [];
[US2992022](#) A []; [US3430697](#) A [];
[US3805891](#) A []; [US3812910](#) A [];
[US3841667](#) A []; [US3847217](#) A [];
[US3958632](#) A []

CCI - [E21B33/00](#)

- PA - WELLSTEIN WILLIAM
- TI - Positive **seal** pitless well adapter
- AB - This is an improvement in Wellstein's U.S. Patent No. 3,812,910 issued May 28, 1974 comprising generally: (1) a positive supporting hook for the drop **pipe** slide member which cooperates with the **hanger** member on the nipple that extends radially through an opening in the well casing; (2) an improved shaped **groove** for the gasket in the washer or nut for better **sealing** the outside of the well casing with the outside of the nipple that extends through the hole therein for withstanding higher pressures; and/or (3) the employment of a pair of gaskets inside and outside the casing surrounding the nipple and contoured to the interior and exterior walls of the casing, also for insuring better **sealing**.

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- PN - [US4421164](#) A 19831220
- PR - US19810316395 19811029
- AP - US19810316395 19811029
- DT - **
- CT - [US3268241](#) A []; [US3404736](#) A [];
[US3457992](#) A []; [US3789925](#) A [];
[US3972546](#) A []; [US4138144](#) A []
- CCI - [E21B33/04](#)
- CCA - [E21B2033/005](#)
- PA - ARMCO INC [US]
- TI - Weight-set pack-off unit
- AB - A weight-set pack-off unit for **sealing** the annulus between inner and outer pipes, such as a mandrel casing **hanger** and a wellhead body in a well. The pack-off unit includes an expandable split ring receivable in a **groove** in the outer **pipe** to prevent upward movement of the pack-off unit relative to the outer **pipe**. The split ring is supported by a second ring which is shear-pinned to the pack-off unit and which moves the split ring into the locking position. The pack-off unit has a downwardly facing load-bearing shoulder in engagement with an upwardly facing load-bearing



shoulder on the inner **pipe**,
thereby increasing the unit's
capacity to carry downward
loads.

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PN - [GB1532256](#) A 19781115
PR - US19750574145 19750502
AP - GB19750052002 19751219
DT - *
CCI - [E21B33/043](#)
PA - FMC CORP
TI - WELL TOOLS
AB - 1532256 Wells &c FMC CORP 19
Dec 1975 [2 May 1975]
52002/75 Heading E1F A well
tool 30 for running and
actuating a well device such as a
packoff assembly 118 (Fig. 1B)
shown landed on a
casing **hanger** 134 in a wellhead
136, comprises an annular body
32, means such as an upper end
element 34 threaded at 36, 40 for
connecting the body 32 to a
well **pipe** 38 for running the tool
30 into a well, a piston 60
disposed for linear movement in
the body 32 in response to fluid
pressure entering the body,
means connected to the piston
60 to convert the linear
movement into torque, these
means comprising e.g. a ball nut
76 and screw 78 assembly (see
also Figs. 11A, 11B, not shown),
an acme nut and screw assembly
(Figs. 12A, 12B, 15-18), or a
helical spline system, and means
to transmit the torque to a well
device or packoff 118 when the
tool 30 and device 118 are
interconnected, these means
comprising e.g. a sun gear 100 in
mesh with planetary gears 104
which themselves mesh with an
annulus gear 110 that can



interconnect with the device 118, or a single annular drive element (Figs. 11B, 12B, 15, 19). The arrangement is such that the well device 118 can be run into a well on the well **pipe** 38 and then actuated by hydraulic fluid conducted to the tool 30, without rotation of the well **pipe**. In operation, the packoff 118 is installed on the tool 30 by aligning lugs 172, 176 on the annulus gear 110 with axial slots 180 in a rotatable body element 116 of the packoff 118, and moving the packoff onto the tool until the lower lugs 172 register with an annular **groove** 174 in the element 116. The packoff is then rotated to move the lugs 172, 176 out of alignment with the slots 180 to jay the packoff on the tool, and in this position the combination is run into the well on the well **pipe** 38 until the packoff lands on the shoulder 158 of the casing **hanger** 134. Hydraulic fluid passed down the **pipe** 38 has its flow checked by a wireline retrievable ball check valve 182 so that fluid passes through a port 182b and a radial passage 186 in the element 34 to the chamber 58 of the piston 60 which is thus moved downwards against the force of a coil spring 188. Any fluid present in the annulus. 192 below the piston exits to the well bore 194 above the tool through a radial passage 196, axial passages 198 and check valves 200. The initial downward movement of the piston 60 rotates the tool until reaction dogs 210, .212 are aligned with slots 214, 216 in the inner surface of the wellhead 136. This stops further rotation

of the tool 30, and also the piston 60 and ball nut 76 since the tool body 32 carries cam followers 64 which extend into longitudinal grooves 62 in the piston 60. Further downward movement of the piston 60 causes rotation of the ball screw 78 and the gears 100, 104, 110. When the lugs 172, 176 on the gear 110 come into alignment with the slots 180, the tool 30 drops so that the lugs move down into the slots and the element 116 now turns with the annular gear 110. During this drop, a slip ring 224, secured to the lower end of the tool body 32 by shear pins 226, forces a setting mandrel 164 downwards behind a setting ring 160 to force the latter into an opposing **groove** 170 in the wellhead 136 to lock the packoff in the wellhead. Further rotation of the gear 110 breaks a shear pin 146 connected between the element 116 and a lower body element 142 which is prevented from rotation by lugs 148 that engage lugs 150 on the **hanger** 134. The element 116 now rotates and also moves upward through left hand threads 144 so that the setting ring 160 rests against the top of its **groove** 170 and the element 142 is pressed downwards to force **seal** elements 152, 154 into contact with the wellhead 136 and **hanger** 134. The fluid pressure is increased to set the pressure-holding capability of the packoff as desired. For pressure testing of the packoff, blowout preventers are closed around the **pipe** 38 and pressure is applied to the bore 194 through a choke and/or kill line

230. If the difference between the outside diameter of the **pipe** 38 and the inside diameter of the **hanger** 134 is sufficient, the shear pins 226 break and the tool drops with respect to the slip ring 224 until a surface 232 of the tool comes to rest on an upper surface 234 of the **hanger** 134, thus transferring all the axial load from the packoff to the **hanger**. Test pressure is then applied through the line 230. After testing, the valve 182 is removed and the tool 30 lifted straight up on the **pipe** 38, the spring 188 returning the piston 60 to its starting position after disengagement of the lugs 172. Amongst other variations described, the tool 30 may be used in conjunction with a wireline retrievable piston resetting tool (Fig. 18) for returning the piston 60 to its starting position, and the bearing assemblies of the tool may be spring-mounted.

PN - [GB1056396](#) A 19670125

PR - US19640402355 19641007

AP - GB19650034290 19650811

DT - **

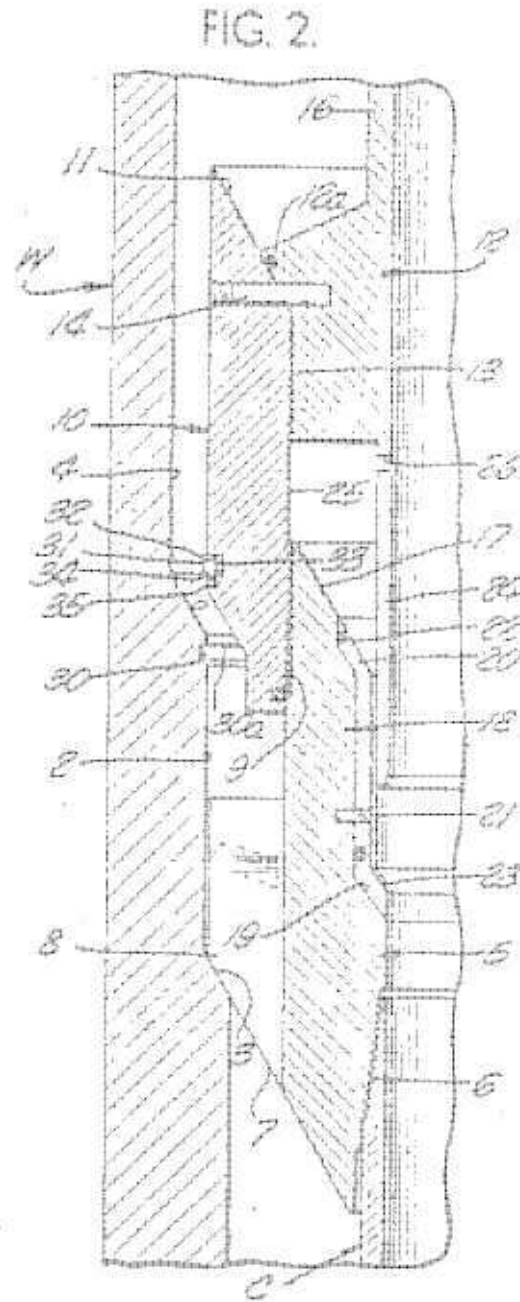
CCI - [E21B33/04](#) ; [E21B33/043](#) ;
[E21B43/10](#)

CCA - [Y10S285/92](#)

PA - FRITZ HUNTSINGER; CARL
FREDERICK HUNTSINGER; FRITZ
ROY HUNTSINGER; JAMES
WILLIAM ELLISON HANES; JOEL LEE
GLENN

TI - Well **pipe hanger** with bypass

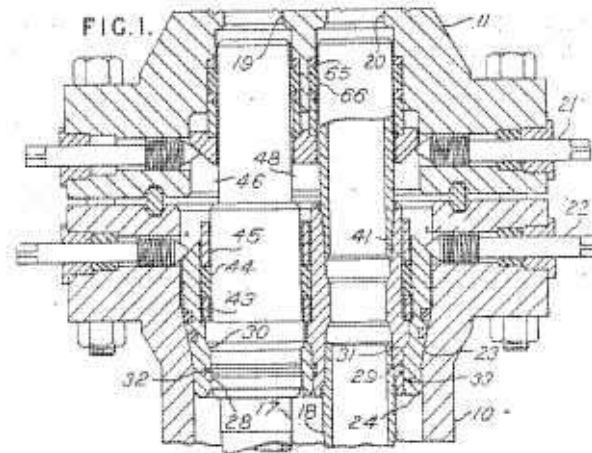
AB - 1,056,396. Wells. F.
HUNTSINGER, C. F. HUNTSINGER,
F. R. HUNTSINGER, J. W. E. HANES
and J. L. GLENN, [trading as
HUNTSINGER ASSOCIATES]. Aug.
11, 1965 [Oct. 7, 1964], No.
3429065. Heading E1F. A **pipe
hanger** seats in a head W and is
so shaped and arranged that a
bypass passage is formed
between the head and **hanger**.
A **seal** member 10 on the **hanger**
base 5 is arranged to be driven
by a member 12 on a running
string P to block the passage.
When the member 10 is in its
blocking position a latch 31
engages a **groove** 30 in the head,
and a pin 14 is sheared to permit
removal of the member 12. In a
modification (Fig. 5, not shown)
a telescopic joint permits the
setting of the **seal** member when
the running string is in tension,
but should the pin be
prematurely sheared the **seal**
member is set by bearing down
on the string to engage clutch
parts on the **seal** member and
string respectively. In a further
modification (Fig. 7, not shown)
the latch is carried by the radial
ribs 8 which form the bypass
passage. The apparatus is



suitable for subaqueous wellheads.

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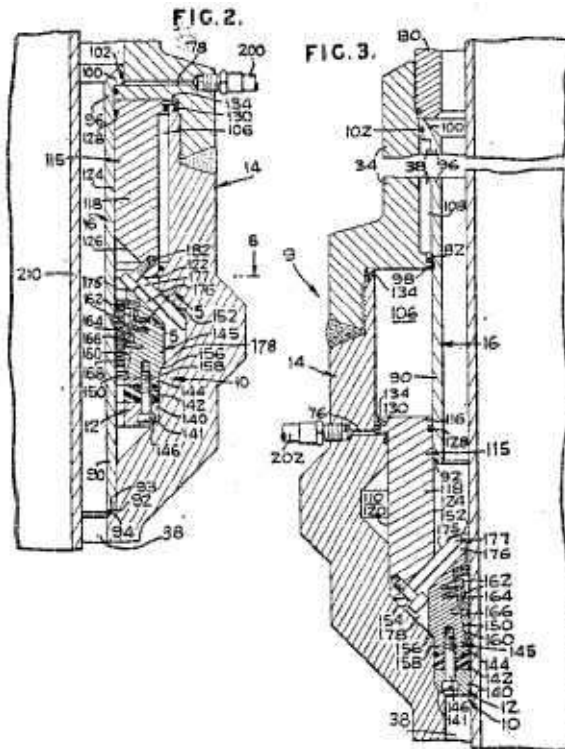
- PN - [GB839959](#) A 19600629
- PR - USX839959 19560709
- AP - GB19560032144 19561022
- DT - *
- CCI - [E21B33/047](#)
- PA - GEORGE AARON BUTLER
- TI - Multiple completion well head apparatus
- AB - 839,959. Wells. BUTLER, G. A. Oct. 22, 1956 [July 9, 1956], No. 32144/56. Class 85 In a well-head comprising upper and lower fittings 11, 10 a number of well pipes 17, 18 are supported from one of the fittings by means of couplings 32, 33 on the pipes. A hangar body 24, carried in the bowl 23 of the tubing head 10, has bores 28, 29 with seats 30, 31 which support the couplings 32, 33 screwed on to the pipes 17, 18. Above the bores the body has an axial opening 41 in which is placed a packing assembly 43...45 tightened by axial bolts passing through the assembly and tapped into the body. The body is held in position by set screws 22, one of the screws engaging a **groove** in the body to ensure alignment of the body. **Pipe** nipples 46, 48 screwed into the couplings enter bores 19, 20 of the dual valve or adapter 11, and packing assemblies 65, 66, 65 tightened by screws 21 being inserted in the bores. In a modification (Fig. 5, not shown) the pipes are supported by and **sealed** in the upper fitting, and a further **seal** tightened by radial set screws rests in the bowl of the tubing



head. In a compact form of the construction shown in Fig. 1 the **hanger** body is aligned by a key on the body or tubing head engaging a slot in the tubing head or body. Specifications 795,598 and 818,820 are referred to.

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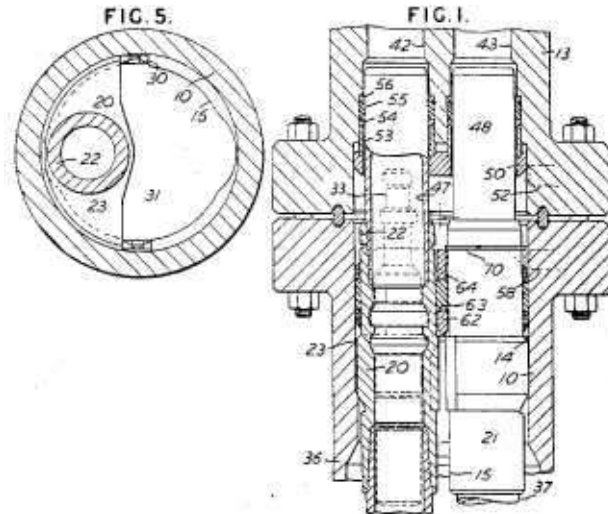
- PN - [GB999873](#) A 19650728
- PR - US19630293708 19630709
- AP - GB19640026030 19640624
- DT - **
- CCI - [E21B33/043](#) ; [E21B33/0422](#)
- PA - FMC CORP
- TI - Improvements in and relating to **pipe** hanging mechanisms for well apparatus
- AB - 999,873. Wells &c. FMC CORPORATION. June 24, 1964 [July 9, 1963], No. 26030/64. Heading E1F. A well **pipe** hanging mechanism comprises a body 14 having a passage 38 therethrough, a **hanger** 10 contractable to engage a **pipe** 210 in the passageway, and a sleeve 16 movable from a **hanger** protecting position (Fig. 2) to a position displaced from the **hanger** (Fig. 3). The body is a sub-aqueous wellhead, the **hanger** comprises segments 12 each having a **seal** 142 and a slip 160, and the sleeve and **hanger** are moved by fluid pressure. Fluid supplied by a duct 78 raises the sleeve to the position shown in Fig. 3, the fluid then passing through a **groove** 82 to move an annular piston 115 to the position shown in Fig. 3 to press the segments into engagement with the **pipe**. The **pipe** is finally hung by its weight shearing pins 166 and



moving the slips downwardly. The segments are retracted by supplying fluid to a duct 76 to raise the piston which is connected by bolts 182 to the segments.

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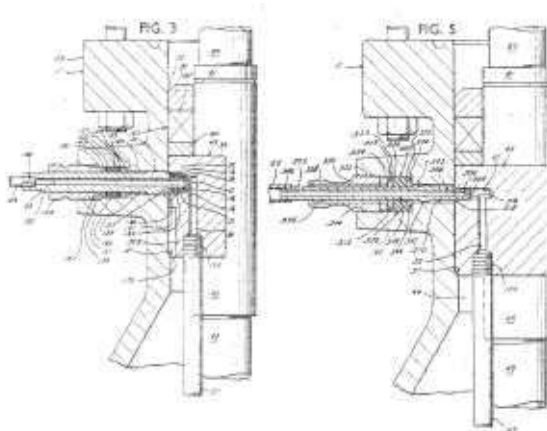
- PN - [GB825025](#) A 19591209
 PR - USX825025 19570221
 AP - GB19570023482 19570724
 DT - *
 CCI - [E21B33/047](#)
 PA - GEORGE AARON BUTLER
 TI - Well apparatus
 AB - 825,025. Wells. BUTLER, G. A. July 24, 1957 [Feb. 21, 1957], No. 23482/57. Class 85 A plurality of well pipes 36, 37 are supported in the passage 14 of a tubing head 10 by hangers 20, 21 which rest on a shoulder 15 within the passage and are prevented from moving laterally by stops 30, 31, the arrangement permitting separate hangers to be removed to provide space for running into the well equipment having greater lateral dimensions than those of the pipes. Each **hanger** comprises an irregular flange 23 and a tubular portion 22 having sockets into which the pipes and **pipe**-nipples 47, 48 are screwed. The pipes are **sealed** in the passage by packing 63 having compression plates 62, 64, the plate 64 being engaged by set screws 58 and the plate 62 resting on the flanges of the hangers. The packing may be lowered into the passage with the **pipe** which is run into the passage last, each **hanger** being provided with a **groove** in which a split ring 70 may be placed to hold the packing in position. The



bores of the hangers may be shaped to house back pressure valves 33. Each of the nipples is **sealed** into a bore 42 or 43 in an upper fitting 13 by packing assemblies 53...56 which are pressed into position by a pressure plate 50 and set screws 52.

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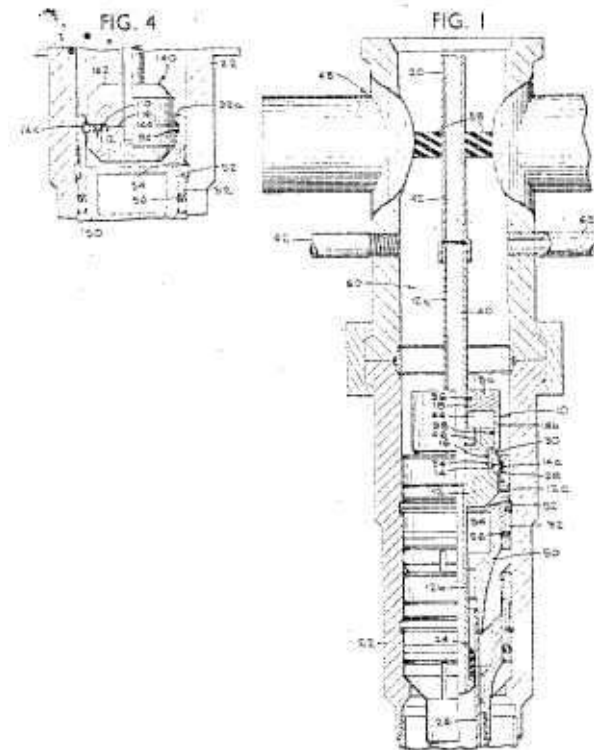
PN - [GB1419849](#) A 19751231
 PR - GB19730021468 19730504
 AP - GB19730021468 19730504
 DT - *
 CCI - [E21B33/047](#) ; [E21B34/16](#)
 PA - MCEVOY OILFIELD EQUIPMENT CO
 TI - WELL COMPLETION EQUIPMENT
 AB - 1419849 Wells &c McEVOY OILFIELD EQUIPMENT CO 4 May 1973 21468/73 Heading E1F In a well completion comprising production tubing 49 having a downhole safety valve (not shown), a **hanger** 43 supporting the tubing, a tubing head 11 supporting the **hanger**, and a **pipe** 57 supplying control fluid to the valve, a duct 150 from the supply of control fluid outside the head is connected to ducts 61, 56 in the **hanger** leading to the **pipe** 57. As shown in Fig. 3 the duct 150 is formed in a stringer 65 which is threaded into the head to engage packing 130, 131 with the **hanger**, the stringer being **sealed** in the head by packing 163, 165, 167. In the modification shown in Fig. 5 a flexible supply conduit 302 is screwed into the **hanger**, and is **sealed** in the head by a **seal** 300. The completions shown are dual completions having split hangers, and the **hanger** couplings 45 include back



pressure valves. In a single completion (Fig. 4, not shown) the **hanger** ducts terminate in an annular **groove** located between upper and lower **seals** on the side of the **hanger**, the **groove** communicating with a radial passage in the head.

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PN - [GB1522741](#) A 19780831
 PR - US19750599141 19750725
 AP - GB19760001926 19760119
 DT - **
 CCI - [E21B33/043](#)
 PA - FMC CORP
 TI - METHOD OF RUNNING
 OPERATING AND RETRIEVING
 SUBSEA WELLEQUIPMENT
 AB - 1522741 Wells &c FMC CORP 19
 Jan 1976 [25 July 1975]
 01926/76 Heading E1F In
 operating a running and
 retrieving tool 10 for use in
 running and retrieving well tools
 into and from a remotely located
 wellhead 22, the tool 10 is
 releasably connected to a well
 tool such as a packoff 32, and
 the combination is run into the
 wellhead on a **pipe** string 20. The
 well tool may then be operated, e.
 g. the packoff 32 can be landed
 on a casing **hanger** 50, locked to
 the wellhead 22 by expanding
 the packoff split lock ring 52 into
 a wellhead **groove** 54, and then
 the packoff resilient **seal** element
 56 can be compressed to provide
 the desired **seal**. After such
 operation, a blowout preventer
 system 48 is closed around the
 string 20 and hydraulic pressure
 is applied to the well below the
 blowout preventers 48 by means
 of a choke and kill line 62
 extending from the wellhead 22



to a control station. In response to this annulus pressure, the means releasably connecting the tool 10 to the well tool 32 are actuated to release the tool 10, and the hydraulic pressure in the choke and kill line 62 may then be released, the blowout preventers 48 opened and the tool 10 withdrawn on the string 20. In the embodiment of Fig. 1 the releasably connecting means comprise an annular piston 18 provided on the tool 10, the piston 18 responding to annulus pressure by moving downwards to contract an axially-split lock ring 14 such that the ring 14 moves out of engagement with an annular **groove** 34 in the well tool 32. A passage 46 vents the chamber 44 of the piston 18 to a central bore 40 in the tool 10, to relieve pressure as the piston moves downwardly. In retrieving the well tool 32 from the wellhead 22, the tool 10 is run in with the piston 18 in its upper position. A cam surface 28 of the lock ring 14 engages the top of the tool 32 so that the ring 14 contracts before expanding into the **groove** 34 to interconnect the tools 10, 32 for retrieval. For use with well tools having "J" slot connecting means, the running and retrieving tool e.g. 140 (Fig. 4) is provided with releasably connecting means comprising several circumferentially spaced spring-biased lock pistons 144 which interconnect the tool 140 and well tool or packoff 32, and are forced inwardly in response to annulus pressure to release the tool 140 for withdrawal. The embodiment of Fig. 4 also differs from that of Fig. 1 in having different pressure balancing

means. The central bore of the tool 140 is here closed at its lower end but pressure balancing is accomplished by providing ports (136) in the **pipe** string above the blowout preventers 48. In further embodiments, different arrangements for pressure balancing are described.

10/10 © EPODOC / EPO

PN - [GB780298](#) A 19570731

PR - USX780298 19550404

AP - GB19560001266 19560113

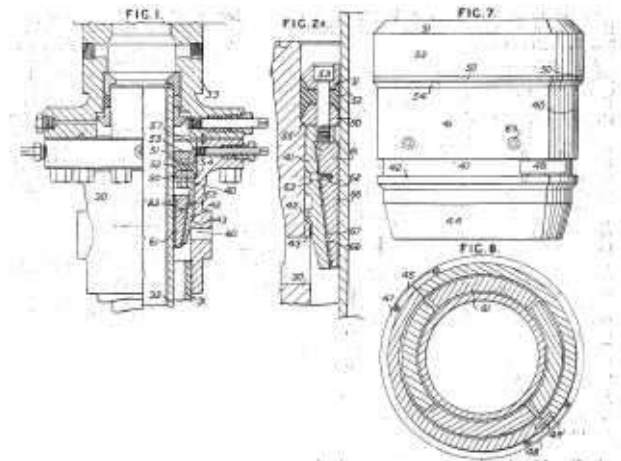
DT - *

CCI - [E21B33/0422](#)

PA - GEORGE AARON BUTLER

TI - **Pipe** suspensions and **sealing** means

AB - 780,298. Well casing heads. BUTLER, G. A. Jan. 13. 1956 [April 4, 1955], No. 1266/56. Class 85 A **pipe** suspension and **seal** apparatus includes a well or casing head 30 having upper and lower seats 55, 43, and a **pipe hanger** 40 provided with upper and lower shoulders 54, 42 respectively adapted to engage the seats, the axial distance between the seats being different from that between the shoulders when a **pipe** is not disposed in the **hanger** whereby when the latter is initially placed in the head without **pipe** load only one of the shoulders 54 engages the corresponding seat 55. **Sealing** means 52 for **sealing** between the **hanger** and well head are disposed in the connection between the parts of the **hanger**, and the latter is provided with means to engage a **pipe** to transfer weight to the part of the **hanger** having the shoulder



42 that is not initially engaged on the seat 43, the **sealing** means shortening axially when **pipe** load is transmitted thereto until the shoulder 42 is seated. As shown in Fig. 1, the head 30 is secured to the upper end of a casing 31, and a **pipe** 32 supported by the head extends into and is **sealed** to the lower portion of a head 33. The **hanger** 40, Figs. 7 and 8, is in halves pivotally connected together by a spring hinge 45 located in a channel 47, a snap latch 48 being arranged oppositely of the hinge; a dowel pin 49 maintains, alignment of the halves of the **hanger**. The top portion of the **hanger** is formed by a compression ring 51 and a support ring 50, both rings being in halves, and disposed between those rings is a split **sealing** ring 52 of neoprene; the three rings are held together by and are slidable on a number of screws 53 engaged in the lower part 41 of the **hanger**. The conical shoulder 54 is formed on the ring 50, and the shoulder 42, also conical, is provided on the part 41. The latter has an internal conical recess 60 within which are disposed a number of slips 61 each provided with a tapped recess 62 which can be aligned with one of a number of holes 63 in the **hanger** whereby a screw retains each slip in a retracted position as shown in Fig. 2A, those screws being removed after the **hanger** is placed around the **pipe** 32 and before the latter is lowered into the head; the slips are maintained in vertical alignment by the engagement of a pin, secured to one side of each slip,

with a **groove** in the adjacent slip. Each slip is formed internally with a number of upwardlydirected teeth 66 of modified buttressthread cross-section and, externally, with a number of downwardly-directed teeth 67 also of buttress-thread cross-section and having flat crests 68. In operation, when the **hanger** is placed in the head 30 the top of the part 41 of the **hanger** is in contact with the ring 50, Fig. 2A, and the **hanger** is seated on the shoulder 55 of the head. Lowering of the **pipe** 32 causes the slips to move downwardly in the recess 60 and the **hanger** to seat on the shoulder 43, the screws 53 consequently drawing the ring 51 down to radially expand the ring 52 against the head and the **pipe**. Where that portion of the weight of the **pipe** transferred to the screws is insufficient to cause the ring 52 to form a good **seal**, additional pressure is placed upon the ring by screws 57 extending through a flange of the head 30 and engaging a bevel on the ring 51. The slips are hardened so that the teeth 66 and 67 respectively bite into the surfaces of the **pipe** and recess 60.

[SS 12] ..v

[EPODOC: SS 12]