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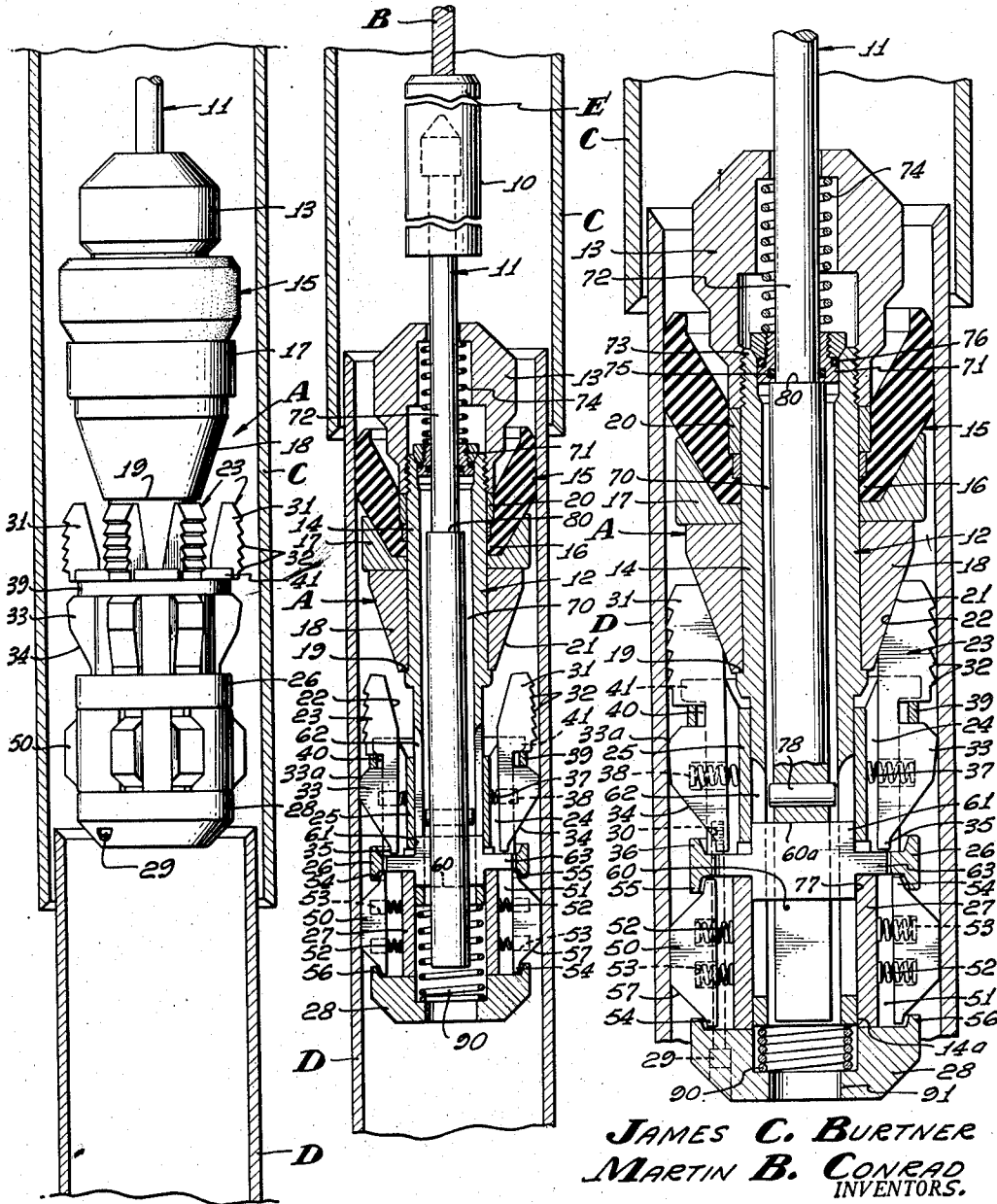
RETRIEVABLE WELL PACKER

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FIG. 1.

FIG. 2.

FIG. 3.



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RETRIEVABLE WELL PACKER

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10 Claims. (Cl. 166—121)

The present invention relates to subsurface well devices, and more particularly to well packers, such as bridge plugs, capable of being anchored in packed-off condition in a well casing, well liner, or similar conduit, disposed in a well bore.

An object of the present invention is to provide an improved retrievable well packer capable of functioning as a bridge plug, the well packer being adapted for anchoring in packed-off condition within the well conduit against downward movement therein, being easily lowered in the well conduit without danger of premature setting, and being easily elevated therein for withdrawal to the top of the hole after it has accomplished its purpose in the well bore.

Another object of the invention is to provide an improved retrievable well packer of the character indicated, which is capable of safely holding high pressures in a well conduit.

This invention possesses many other advantages, and has other objects which may be made more clearly apparent from a consideration of a form in which it may be embodied. This form is shown in the drawings accompanying and forming part of the present specification. It will now be described in detail, for the purpose of illustrating the general principles of the invention; but it is to be understood that such detailed description is not to be taken in a limiting sense, since the scope of the invention is best defined by the appended claims.

Referring to the drawings:

Figure 1 is a side elevation of a well packer being run in a well bore;

Fig. 2 is a longitudinal section through the well packer disposed in a liner below a string of casing, with the packer parts in retracted position;

Fig. 3 is an enlarged view, similar to Fig. 2, of the packer anchored to the liner.

As disclosed in the drawings, it is desired to lower a well packer A by means of a running-in string B, such as a wire line, through a string of well casing C to a desired setting point therein, or within a well liner D that depends below the lower end of the well casing. The inside diameter of the well liner D is substantially less than the inside diameter of the well casing C.

The well packer is pushed down through the fluid in the well casing and liner by a suitable running-in tool E that may be disposed over the upper head 10 of a control bar 11 of the well packer, which extends into the tubular body 12 of the well packer. The weight of the running-in tool E will be exerted upon the control bar to push it in a downward direction. As described hereinafter, such downward movement is transmitted to the main portions of the well packer A to insure its downward movement through the well casing C, or into the well liner D therebelow.

The well packer A includes the tubular body 12, the upper end of which is formed as a skeletonized valve cage 13 threadedly secured to the upper end of the main body portion 14. Surrounding the main body is a cup

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type of packing 15 adapted to seal against the wall of the well casing C or the wall of the liner D. This packing is in the form of an upwardly facing cup, made of rubber or rubber-like material, the base 16 of the cup being received within a metallic thimble 17 bearing upon the upper, or larger end, of a conical expander 18 surrounding the body, the lower, or small end, of this expander engaging a body shoulder 19. The valve cage 13 functions as the nut, bearing upon a spacer 20 within the packing cup 15, which is effective to clamp the base 16 of the packing cup against the thimble 17, upon the proper threading action of the upper valve cage onto the main portion 14 of the body 10.

The expander 18 has a downwardly converging tapered surface 21 adapted to coact with corresponding tapered or inclined surfaces 22 on a plurality of circumferentially spaced slips 23 surrounding the body 14 below the expander. These slips are disposed in circumferentially spaced longitudinally extending grooves 24 in a slip ring 25. The slip ring bears against a tie ring 26, which, in turn, engages the upper end of a drag block ring 27 resting upon a guide 28, which forms the terminal portion of the well packer. The slip ring 25, tie ring 26, drag block ring 27 and guide ring 28 are secured together, to provide a functionally unitary structure, by a plurality of longitudinally extending cap screws 29, which pass through the guide, drag block ring and tie ring for threaded reception within threaded holes 30 in the slip ring 25. Tightening of the screws 29 will secure the several parts together.

Each slip 23 is movable laterally within a slot 24. The upper portion of the slip is constituted as a casing or liner gripping member 31 having wickers or teeth 32 adapted to engage and embed into the wall of the casing or liner. This gripper portion 31 also possesses the expander surface 22. Below the anchoring portion 31 each slip member has a drag block portion 33 adapted to frictionally slide along the wall of the well casing C, or, if the well packer is of the size to be set in the liner D below the casing, along the wall of the liner D. Below the drag block portion 33, each slip member has a tapered surface 34 inclined in a downward and inward direction and terminating in a foot portion 35 extending within an upwardly projecting rim 36 of the tie ring 26.

The drag block portion 33 will normally be in engagement with the wall of the well casing C (if the well packer is to be set within a well casing), or with the wall of the well liner D. The upper end 33a of the drag block portion functions as a fulcrum, permitting each slip 23 to rock upon the casing or liner wall. The drag block portions 33 of each slip member are urged in an outward direction by a helical compression spring 37 bearing against the base of the groove 24 and also upon the base of a slip socket 38 below the slip fulcrum or pivot point 33a. It is evident that when the drag block engages the casing or liner wall, the spring 37 will urge the drag block portion 33 outwardly until substantially its entire surface or length engages the casing or liner wall. When the drag block portion so engages the casing or liner wall, the upper anchoring head 31 will be spaced inwardly from the wall and will remain in such position out of contact or engagement with the casing or liner wall.

When the tool A is out of the hole, the extent of outward shifting of each slip 23 under the action of its compression spring 37 is limited by engagement of the foot portion 35 with the rim 36 of the tie ring 26, and also by engagement of the slip with a retaining ring 39 circumscribing all of the slips and disposed within an external transverse groove 40 in each slip, which may be provided immediately below its casing or liner engaging teeth 32. The upper end of this ring 39 also engages an

outwardly directed flange 41 integral with the slip ring 25, in order that downward movement of the slip ring 25 will act through the retaining ring 39 to move all the slips 23 jointly in a downward direction within the well bore.

As described below, the drag block portions 33 of the slip members 23 will tend to resist their longitudinal movement in the well bore, whereupon the body 12 of the tool, together with the expander 18 and packing structure 15, can move downwardly relative to the slips, to cause the expander 18 to move into the upper slip portions 31, the tapered expander surface 21 engaging the tapered slip surfaces 22 and expanding the slip portions 31 laterally outward into anchoring engagement with the wall of the well casing or liner. In expanding, the slips rock about their fulcrum points 33a to swing the portions 33, 35 below the fulcrum points inwardly and the tooth anchoring slip head 31 outwardly, until the latter firmly engage the casing or liner wall.

To insure the provision of adequate frictional resistance to longitudinal movement of the slips 23 within the well bore, the friction afforded by the drag block portions 33, under the action of the slip springs 37, may be supplemented by circumferentially spaced auxiliary drag blocks 50, each of which is disposed in a circumferentially spaced groove 51 in the drag block ring 27. The auxiliary drag blocks 50 are urged outwardly, to place their external surfaces in frictional engagement with the casing or liner wall, by a plurality of helical compression springs 52 engaging the base of the drag block retaining sleeve groove 51 and received within sockets 53 in each drag block to bear against the base of the socket and urge the latter outwardly of the ring 27. The extent of outward movement of the drag block is limited by the engagement of upper and lower drag fingers 54 with a depending rim 55 on the tie ring 26 and an upwardly extending rim 56 on the guide 28, respectively.

To insure the appropriate entry of the apparatus into the well casing or liner, the lower portions 57, 34 of the drag blocks 50 and the slips 23 are inclined in a downward and inward direction, so that the engagement of the drag blocks and slips with the upper end of the casing C, or of the liner D, will force the drag blocks and the slips inwardly against the action of their respectable helical springs 37, 52.

The slips 23 and drag blocks 50 are movable longitudinally as a unit relative to the body 12 of the tool, the expander 18 mounted thereon and the packing structure 15. Thus, the slip ring 25 and drag block ring 27 are slidably mounted on the lower portion of the body. When the slips 23 are held in their downward position away from the expander 18, they cannot be expanded outwardly into anchoring engagement with the wall of the well casing or liner. It is only when the body expander 18 and packing structure 15 are permitted to move downwardly with respect to the slips 23, that anchoring of the latter against the casing or liner wall can occur.

In lowering the apparatus in the well bore, the body 12 and expander 18 are prevented from moving relatively downward of the slips 23 until a desired location is reached in the well casing or well liner at which the packer is to be anchored therewithin. The permissibility of the above-mentioned relative movement to occur is dependent upon apparatus now to be described.

The control bar 11 extends through the upper valve cage 13 and completely through the tubular body 14. The lower end of the control bar has a longitudinal slot 60 extending therethrough in which a cross-link 61 is received, this cross-link projecting into diametrically opposed longitudinally extending slots 62 in the body with the outer ends 63 of the cross-link, which are of substantially reduced longitudinal extent, being suitably secured to the slip retaining ring 25, tie ring 26 and drag block ring 27, as by clamping the ends 63 between the slip retaining ring 25 and the drag block retaining ring 27

when the screws 29 are tightened. Thus, the cross-link 61 is coupled to move longitudinally with the slip ring 25, drag block ring 27, slips 23 and drag blocks 50.

The cross-link 61 can occupy a lower position within the body 14 in engagement with the lower ends of the body slots 62, wherein the slips 23 are spaced substantially below the conical expander 18. When the cross-link 61 is held in such lower position, it will engage the body 14, and if moved downwardly will move the body downwardly with it. The retention of the cross-link in the position just described is obtained whenever the control bar 11 is moved downwardly in the well casing or liner. Thus, the downward movement of the control bar 11 will insure that the upper end 60a of its slot 60 engages the upper end of the cross-link 61, forcing the latter downwardly against the lower ends of the body slots 62 to carry the body 12 and the entire slip and drag block assembly downwardly with it. In this manner, the body 12, expander 18 and packing structure 15 cannot move downwardly relative to the slips 23 and drag blocks 50, and this action occurs despite the fact that the drag block portions 33 of the slips and the auxiliary drag blocks 50 themselves may be frictionally engaging the wall of the well casing C or the liner D. It is only when the desired setting point is reached in the well casing or liner at which the well packer is to be anchored, that the downward force on the control bar 11 is relieved. When this occurs, the pressure in the well casing or liner above the packer cup 15 will act downwardly on it to shift it and the body 12 and expander 18 downwardly, the friction action of the drag blocks 33, 50 against the well casing or liner preventing corresponding downward movement of the slips 23. Accordingly, the body 12 will slide downward of the slips, as permitted by their elongated slots 62, until the expander 18 wedges into the upper ends 31 of the slips, rocking them about their fulcrums 33a and embedding their teeth 32 into anchoring engagement with the wall of the well casing or liner.

The maximum diameter of the control bar 11 within the body 12 of the tool is substantially less than the inside diameter of the body, to define an annular passage 70 therebetween of substantial area through which fluid in the well bore can pass, both in an upward or downward direction, depending upon the direction of movement of the apparatus in the well bore. To prevent downward movement of fluid in the well bore when the packer is to be anchored in packed-off condition in the well casing, a valve head 71 may be slidably mounted on the upper reduced diameter portion 72 of the control bar, this valve head being movable downwardly into engagement with a valve seat 73 at the upper end of the main body portion 14, to close the annular passage 70 against downward flow of fluid therethrough. If desired, a helical compression spring 74 may be disposed around the control bar 11, bearing against the upper end of the valve cage 13 and against the upper end of the valve head 71 to urge and tend to maintain the latter in engagement with its companion seat 73. To prevent leakage around the valve head when engaged with its seat, suitable seal rings may be provided, such as an inner seal ring 75 on the head that can slidably and sealingly engage the periphery of the control bar 11, and an outer seal ring 76 on the head that can seal within the companion cylindrical seat 73 in the body 14 of the tool.

The control bar 11 is guided in its longitudinal movement relative to the body 12 by the upper end of the valve cage 13, and by the engagement of the outer ends 77 of the cross-link 61, on opposite sides of its reduced terminal portions 63, with the inner wall of the slip ring 25. If further centering of the control bar 11 is deemed essential, a cross pin 78 may be provided which extends transversely through the control bar 11, this cross-link having a length substantially corresponding to the inside diameter of the body 14 of the tool, in order to prevent

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any substantial lateral motion of the control bar within the body of the tool.

Assuming that the apparatus is to be set within the well casing C, it is forced into the casing against the action of the springs 37, 52, the drag blocks 50 and the slip members 23 being moved inwardly to a certain extent. The running-in tool E is disposed over the control bar head 10 to bear thereagainst in a downward direction, the running-in tool being secured to a running-in string B, such as the wire line. The running-in tool E has sufficient weight to force the entire apparatus down through the well casing C, the running-in tool bearing against the control bar 11 to shift it downwardly, causing the upper end 60a of the control bar slot 60 to engage the cross-link 61 and shift it downwardly against the body portions defining the lower ends of the longitudinal body slots 62. The parts are then in the position illustrated in Fig. 2. The apparatus can now be lowered in the well casing. Fluid below the apparatus can by-pass around the packing element 15 by flowing through the annular passage 70 between the control bar 11 and the body 14, unseating the valve head 71 and passing out through the openings in the valve cage 13 into the well casing above the packing. During such lowering movement, the body 12 of the tool will not move downwardly with respect to the slips 23, so that the slips are retained in their retracted positions, and will not be expanded outwardly into anchoring engagement with the wall of the well casing.

When the location in the well casing is reached at which the tool is to be anchored, the running-in string B and the running-in tool E need merely be elevated to remove the downward force on the control bar 11, cross-link 61, slip assembly 25, 23 and body 12 of the tool. The friction of the drag blocks 33, 50 against the casing will tend to hold the slips in the location to which they have been lowered. The absence of any downward movement of the tool through fluid in the casing will allow the spring 74 to move the valve head 71 against its seat 73, closing the annular passage 70 through the body against downward flow of fluid. Accordingly, any fluid pressure in the well casing above the packing cup 15 will act downwardly on the packing cup and the body 12 of the tool, shifting the body 12 in a downward direction within the slip sleeve 25, and carrying the expander 18 downwardly with it until the expander is wedged into the heads 31 of the slips, rocking the latter outwardly on their fulcrums 33a to engage the slip teeth 32 with the wall of the well casing. Any increase in pressure of the fluid above the packing cup 15 will cause the expander 18 to wedge more firmly into the slips 23, embedding their teeth to a greater extent in the wall of the well casing.

The aforementioned relative downward movement of the body 12 with respect to the slip and drag block assembly is permitted by virtue of the elongate slots 62 in the body, which will allow the body to slide downwardly along the cross-link 61.

In the event it is desired to retrieve the well packer, it is only necessary to lower a suitable tool, such as an overshot, in the casing, which will pass over the control head 10 and become coupled to it. The particular retrieving tool forms no part of the present invention and, hence, need not be described. An upward pull can now be taken on the wire line B, or other suitable running-in string, attached to the overshot, the control bar 11 being elevated in the well casing until its shoulder 80 engages the valve head 71, lifting the latter out of its seat 73 and opening the annular passage 70 to permit downward flow of fluid therethrough. The control bar 11 will move upwardly until the valve head 71 engages the valve cage 13, whereupon further upward movement of the control bar will carry the body 12, packing structure 15 and expander 18 upwardly with it, shifting the expander out of the slips 23, and allowing the springs 37 to rock the slips about their fulcrums 33a to shift their drag block portions 33 into full engagement with the casing wall, and retract-

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ing the anchoring head portions 31 away from the casing wall. The body 12 will move upwardly until the lower ends of the body slots 62 engage the cross-link 61, thereby effectively coupling the body to the slip assembly 25. Continued elevating movement of the running-in string B will now elevate the entire apparatus A in the well casing toward the top of the hole. During such elevating movement, the fluid in the well casing can by-pass the packing cup 15 by flowing relatively down through the annular passage 70 through the body.

In the event it is desired to set the apparatus A in a well liner D that extends below the well casing C, the drag block portions 33 of the slips and the drag blocks 50 themselves, as well as the periphery of the packing sleeve 15, may not engage the wall of the well casing during their lowering therewithin. This is due to the fact that these parts are of a smaller effective diameter than the casing I. D. to operate properly within the liner D of substantially smaller internal diameter than the internal diameter of the casing C. During lowering of the apparatus through the well casing C, the weight of the body 12, expander 18 and packing assembly 15 may be such as to cause these parts to fall by gravity into a lower position, in which the expander 18 is disposed in wedged engagement with the anchoring slip heads 31. To prevent this action, the body 12, expander 18 and packing structure 15 are urged in an upward direction by a helical compression spring 90 of adequate force, the lower end of which engages an inwardly directed flange 91 on the guide 28, the upper end of which engages the lower end 14a of the body. This spring exerts sufficient force to more than offset the weight of the body 12, expander 18 and packing assembly 15, 17, 20 thereabove, but is preferably not made too strong so that even relatively low pressures encountered in the well bore will be effective to shift the packing assembly, expander and body in a downward direction whenever the apparatus is to be anchored in the well liner. Thus, the helical compression spring 90 retains the parts in appropriate position for running through the well casing C, despite the absence of any frictional resistance to downward movement of the apparatus therewithin (Fig. 1).

When the apparatus enters the liner D, its upper end forces the friction drag blocks 50 and the slips 23 inwardly to insure adequate friction to resist longitudinal movement of the slips 23 in the well liner, and to also insure the inward pivoting of the slip heads 31 from the liner wall to prevent their engagement therewith. During downward movement of the apparatus in the liner, the control bar 11 will engage the cross-link 61 to hold it against the lower end of the body slots 62 and insure retention of the parts in the position disclosed in Fig. 2, until the setting point in the liner is reached. When such point is reached, the running-in string B and running-in tool E are elevated from the control bar head 10, whereupon the valve 71 will close, pressure in the liner D above the packing 15 acting downwardly thereon to shift the packing structure, expander 18 and body 12 relatively downward of the slip and drag block assemblies, which are prevented from moving downwardly by the frictional action of the drag blocks 33, 50 against the liner wall. Such downward movement can occur despite the compression spring 90, which can be readily compressed to a greater extent, since the force which it exerts is much less than the friction force of the drag members 33, 50 against the liner wall. The expander 18 moves into and wedges against the slips 23, to rock them outwardly for the purpose of embedding their teeth 32 firmly into engagement with the wall of the well liner.

Retrieving of the apparatus occurs in precisely the same manner as described in connection with the setting and retrieving of the well packer in well casing.

The inventors claim:

1. In a well tool: a body adapted to be moved longitudinally in a well conduit; expander means movable

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longitudinally with said body in the conduit; slip means below said expander means movable longitudinally with respect to said body and expander means; means coacting with said slip means and frictionally engageable with the conduit to enable said body and expander means to be moved downwardly of said slip means to cause said expander means to expand said slip means into engagement with the conduit; said body having an elongate slot therein; and means connected to said slip means to move longitudinally therewith and slidable in said slot into engagement with said body at the lower end of said slot to jointly move said body, expander means and slip means down the conduit with said expander means out of expanding relation to said slip means.

2. In a well tool: a body adapted to be moved longitudinally in a well conduit; expander means movable longitudinally with said body in the conduit; slip means below said expander means movable longitudinally with respect to said body and expander means; means coacting with said slip means and frictionally engageable with the conduit to enable said body and expander means to be moved downwardly of said slip means to cause said expander means to expand said slip means into engagement with the conduit; said body having an elongate slot therein; a rod movable longitudinally in said body and projecting upwardly therefrom, said rod having an elongate slot therein; and a cross member connected to said slip means against longitudinal movement relative thereto and slidable longitudinally in said slots relative to said body and rod; said rod being movable downwardly in said body to engage said rod at the upper end of said rod slot with said cross member and to engage said cross member with said body at the lower end of said body slot to jointly move said body, expander means and slip means down the conduit with said expander means out of expanding relation to said slip means.

3. In a well tool: a body adapted to be moved longitudinally in a well conduit; expander means movable longitudinally with said body in the conduit; slip means below said expander means movable longitudinally with respect to said body and expander means; means coacting with said slip means and frictionally engageable with the conduit to enable said body and expander means to be moved downwardly of said slip means to cause said expander means to expand said slip means into engagement with the conduit; said body having an elongate slot therein; means connected to said slip means and slidable in said slot into engagement with said body at the lower end of said slot to jointly move said body, expander means and slip means down the conduit with said expander means out of expanding relation to said slip means; and spring means engaging said body and slip means and tending to prevent downward movement of said body and expander means relative to said slip means.

4. In a well tool: a body adapted to be moved longitudinally in a well conduit; expander means movable longitudinally with said body in the conduit; slip means below said expander means movable longitudinally with respect to said body and expander means; means coacting with said slip means and frictionally engageable with the conduit to enable said body and expander means to be moved downwardly of said slip means to cause said expander means to expand said slip means into engagement with the conduit; said body having an elongate slot therein; means connected to said slip means and slidable in said slot into engagement with said body at the lower end of said slot to jointly move said body, expander means and slip means down the conduit with said expander means out of expanding relation to said slip means; and a lower guide secured to said slip means below said body.

5. In a well tool: a body adapted to be moved longitudinally in a well conduit; expander means movable

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longitudinally with said body in the conduit; slip means below said expander means movable longitudinally with respect to said body and expander means; means coacting with said slip means and frictionally engageable with the conduit to enable said body and expander means to be moved downwardly of said slip means to cause said expander means to expand said slip means into engagement with the conduit; said body having an elongate slot therein; means connected to said slip means and slidable in said slot into engagement with said body at the lower end of said slot to jointly move said body, expander means and slip means down the conduit with said expander means out of expanding relation to said slip means; spring means engaging said body and slip means and tending to prevent downward movement of said body and expander means relative to said slip means; and a lower guide secured to said slip means below said body.

6. In a well tool: a body adapted to be moved longitudinally in a well conduit; expander means movable longitudinally with said body in the conduit; slip means below said expander means movable longitudinally with respect to said body and expander means; means coacting with said slip means and frictionally engageable with the conduit to enable said body and expander means to be moved downwardly of said slip means to cause said expander means to expand said slip means into engagement with the conduit; said body having an elongate slot therein; a rod movable longitudinally in said body and projecting upwardly therefrom, said rod having an elongate slot therein; a cross member connected to said slip means against longitudinal movement relative thereto and slidable longitudinally in said slots relative to said body and rod; said rod being movable downwardly in said body to engage said rod at the upper end of the rod slot with said cross member and engage said cross member with said body at the lower end of said body slot to jointly move said body, expander means and slip means down the conduit with said expander means out of expanding relation to said slip means; a lower guide secured to said slip means below said body; and spring means engaging said guide and body and tending to prevent downward movement of said body and expander means relative to said slip means.

7. In a well tool: a body adapted to be moved longitudinally in the well conduit; an expander secured to said body to move longitudinally therewith; an annular member slidably mounted on said body below said expander; laterally movable slips carried by said annular member; friction drag means coacting with said slips and frictionally engageable with the conduit to enable said body and expander to be moved downwardly of said annular member and slips to cause said expander to engage and expand said slips into engagement with the conduit; said body having an elongate slot therein; and means connected to said annular member against longitudinal movement relative thereto and slidable in said slot into engagement with said body at the lower end of said slot to jointly move said body, expander, annular member and slips down the conduit with said expander out of expanding relation to said slips.

8. In a well tool: a body adapted to be moved longitudinally in the well conduit; an expander secured to said body and movable longitudinally therewith; an annular member slidably mounted on said body below said expander; laterally movable slips carried by said annular member; friction drag means coacting with said slips and frictionally engageable with the conduit to enable said body and expander to be moved downwardly of said annular member and slips to cause said expander to engage and expand said slips into engagement with the conduit; said body having an elongate slot therein; and means connected to said annular member against longitudinal movement relative thereto and slidable in said slot into engagement with said body at the lower end of said slot to jointly move said body, expander, annular

member and slips down the conduit with said expander out of expanding relation to said slips; and conduit engageable drag means below said slips carried by said annular member.

9. In a well tool: a body adapted to be moved longitudinally in a well conduit; an expander secured to said body to move longitudinally therewith; an annular member slidably mounted on said body; laterally movable slips carried by said annular member to move longitudinally therewith; means coacting with said slips and frictionally engageable with the conduit to enable said body and expander to be moved downwardly of said annular member and slips to cause said expander to engage and expand said slips into engagement with the conduit; said body having an elongate slot therein; a rod movable longitudinally in said body and projecting upwardly therefrom, said rod having an elongate slot therein; and a cross member connected to said annular member against longitudinal movement relative thereto and slidable longitudinally in said slots relative to said body and rod; said rod being movable downwardly in said body to engage said rod at the upper end of said rod slot with said cross member and engage said cross member with said body at the lower end of said body slot to jointly move said body, expander, annular member and slips down the conduit with said expander out of expanding relation to said slips.

10. In a well tool: a body adapted to be moved longi-

tudinally in a well conduit; an expander secured to said body to move longitudinally therewith; an annular member slidably mounted on said body; laterally movable slips carried by said annular member to move longitudinally therewith; means coacting with said slips and frictionally engageable with the conduit to enable said body and expander to be moved downwardly of said annular member and slips to cause said expander to engage and expand said slips into engagement with the conduit; said body having an elongate slot therein; a rod movable longitudinally in said body and projecting upwardly therefrom, said rod having an elongate slot therein; a cross member connected to said annular member against longitudinal movement relative thereto and slidable longitudinally in said slots relative to said body and rod; said rod being movable downwardly in said body to engage said rod at the upper end of said rod slot with said cross member and engage said cross member with said body at the lower end of said body slot to jointly move said body, expander, annular member and slips down the conduit with said expander out of expanding relation to said slips; and conduit engageable drag means carried by said annular member below said slips.

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