Aug. 15, 1967 W. D. MYERS 3,335,800

RETRIEVABLE PARALLEL STRING WELL PACKER APPARATUS

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FIG. 1.

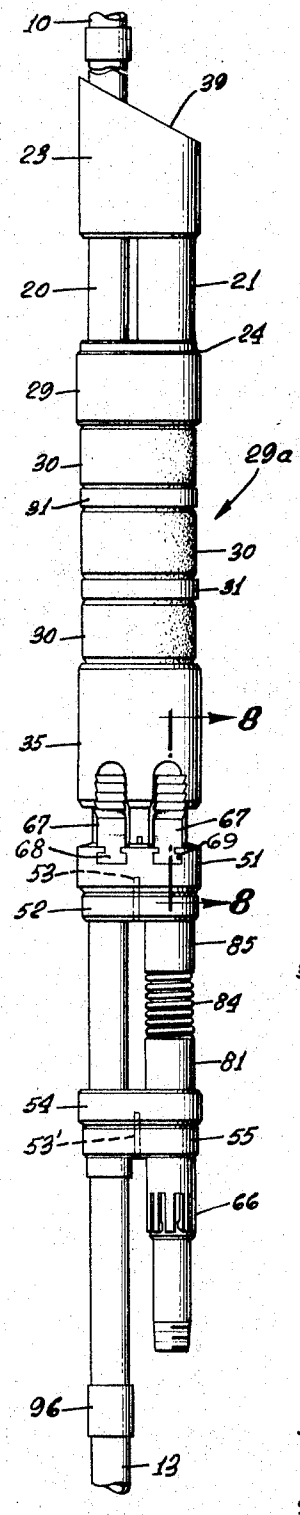


FIG. 2a.

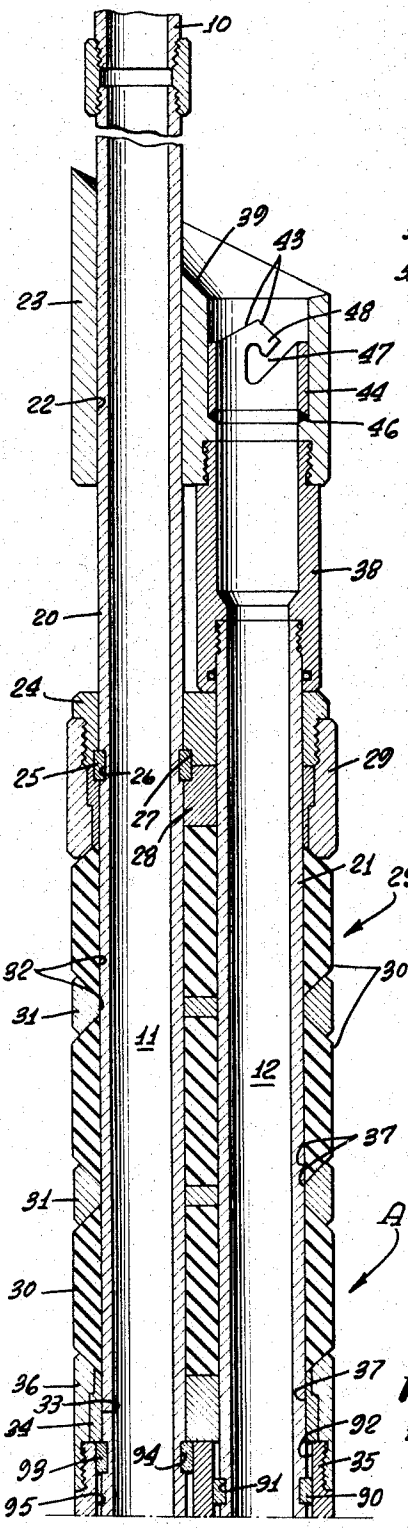
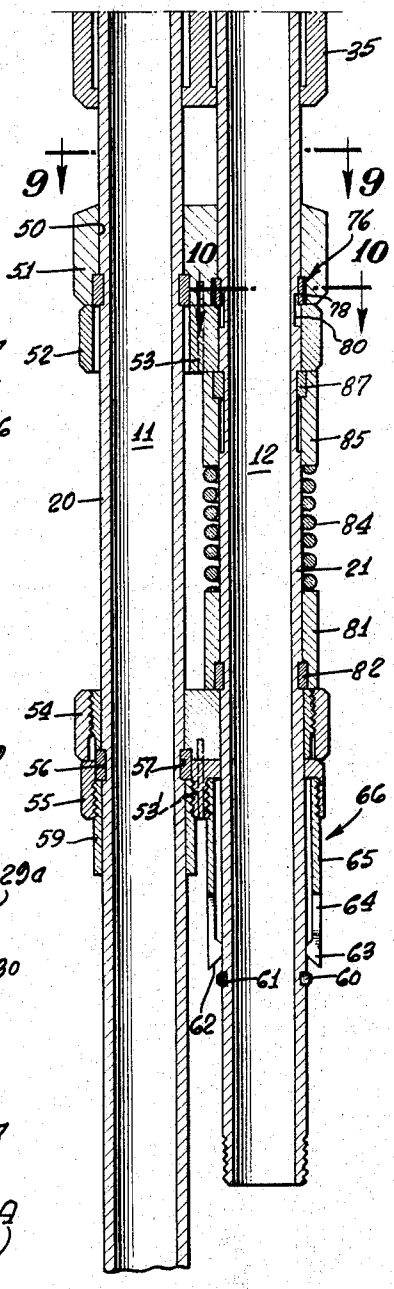


FIG. 2b.



INVENTOR
WILLIAM D. MYERS
by Bernard Kriegel
ATTORNEY

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FIG. 3a.

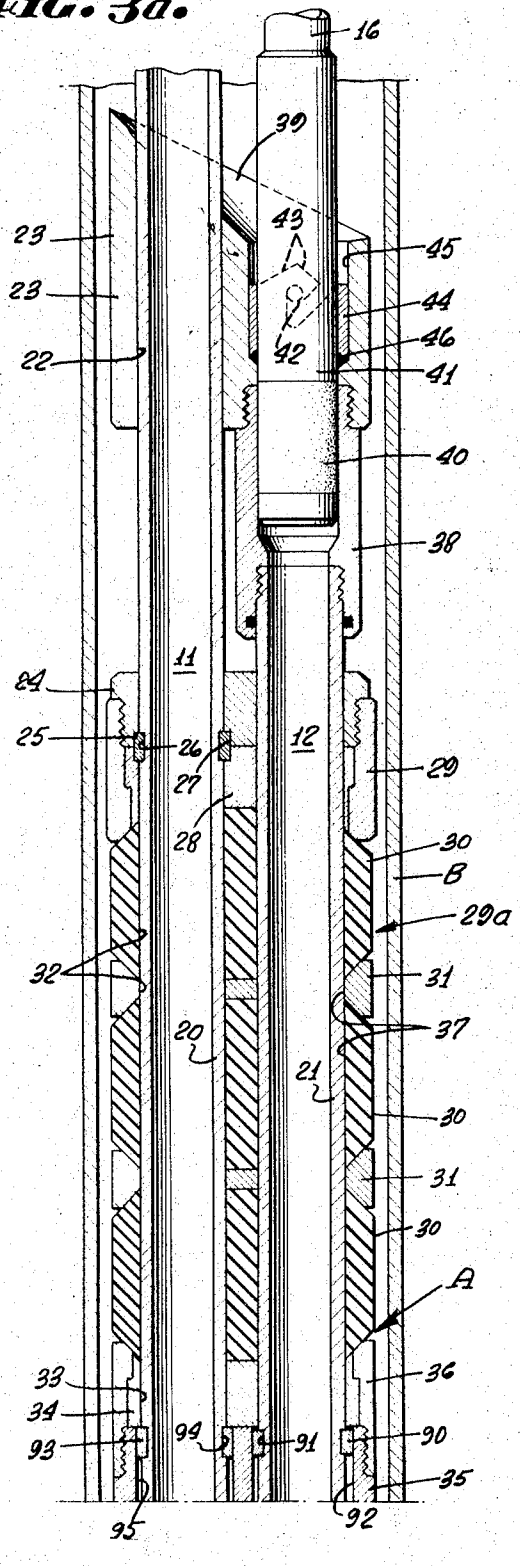
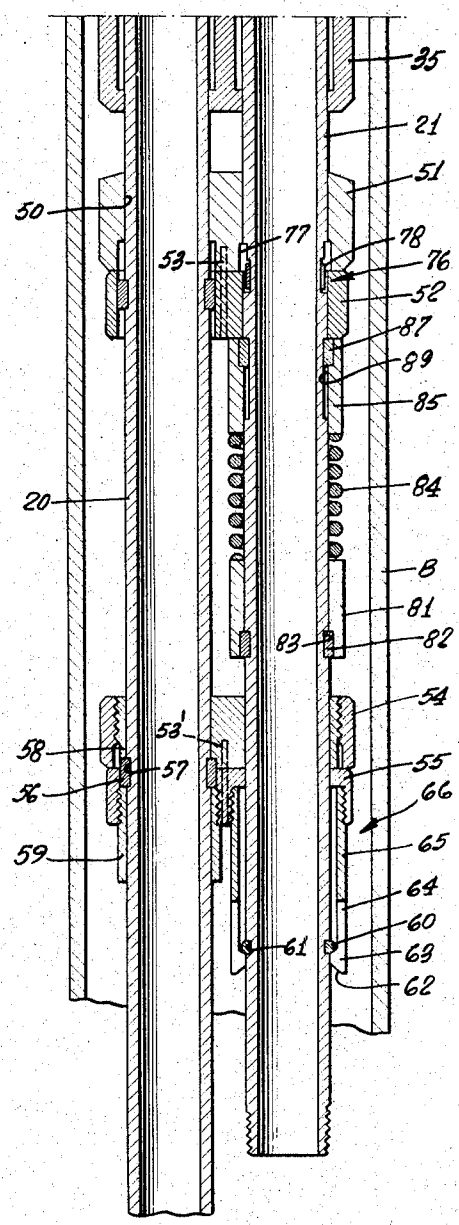


FIG. 3b.



INVENTOR.
WILLIAM D. MYERS
by Bernard Kriegel
ATTORNEY

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FIG. 4a.

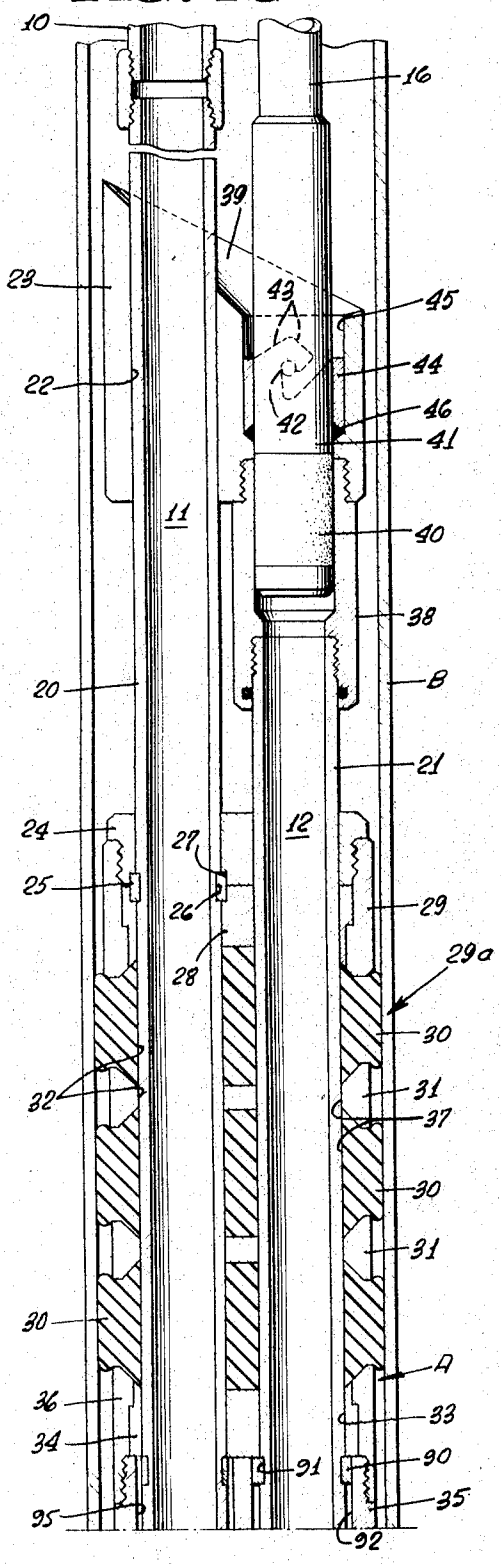
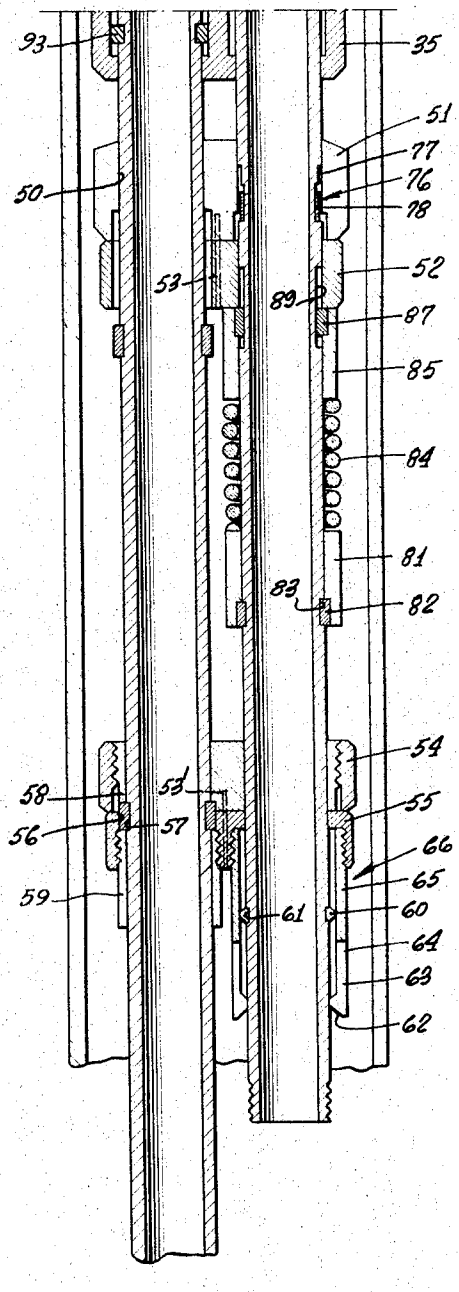


FIG. 4b.



INVENTOR.
WILLIAM D. MYERS
by Bernard Kriegel
ATTORNEY

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FIG. 5.

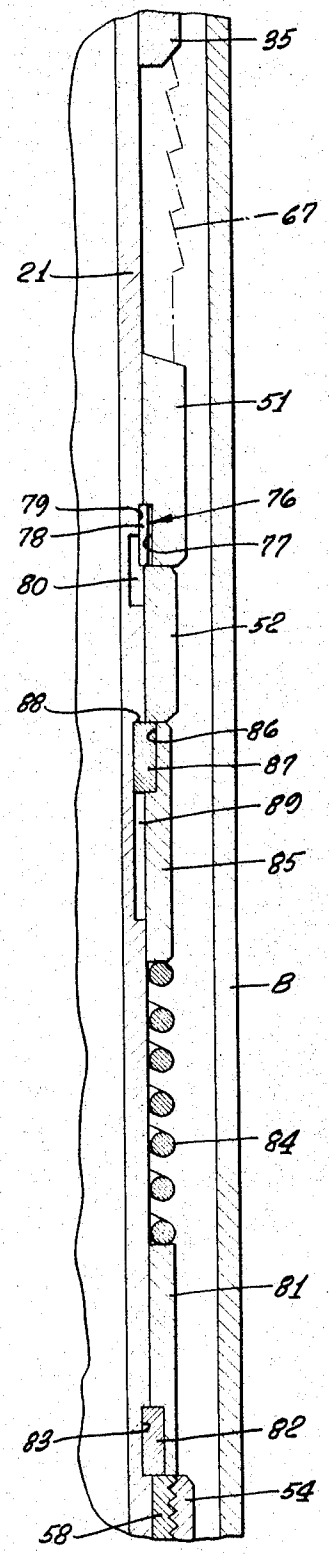


FIG. 6.

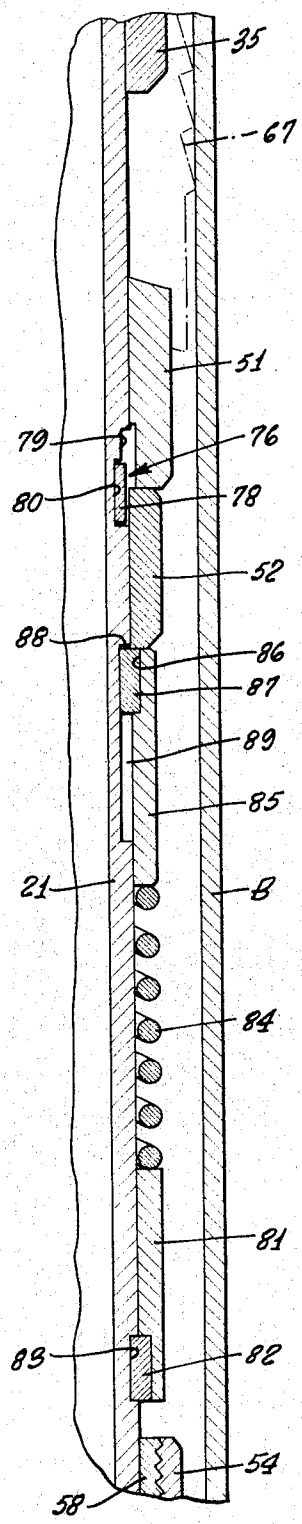
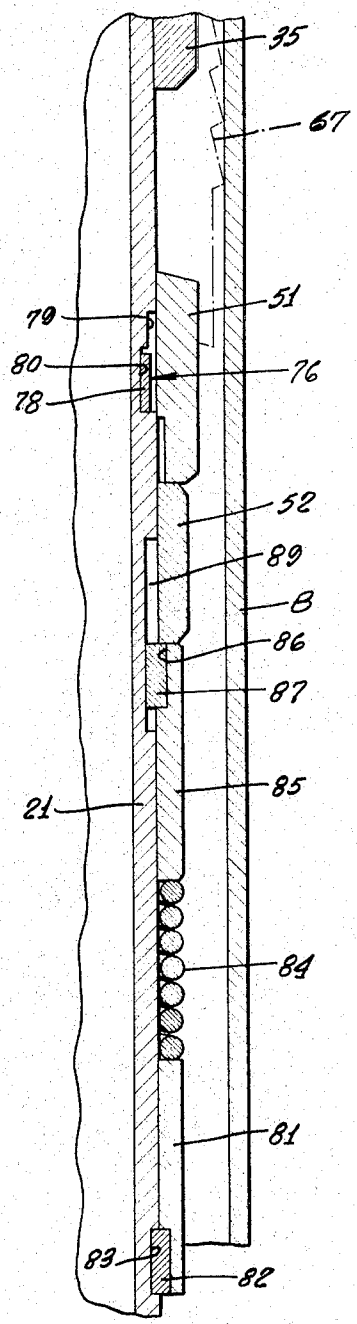


FIG. 7.



INVENTOR.
WILLIAM D. MYERS
by Bernard Kriegel
ATTORNEY

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FIG. 8.

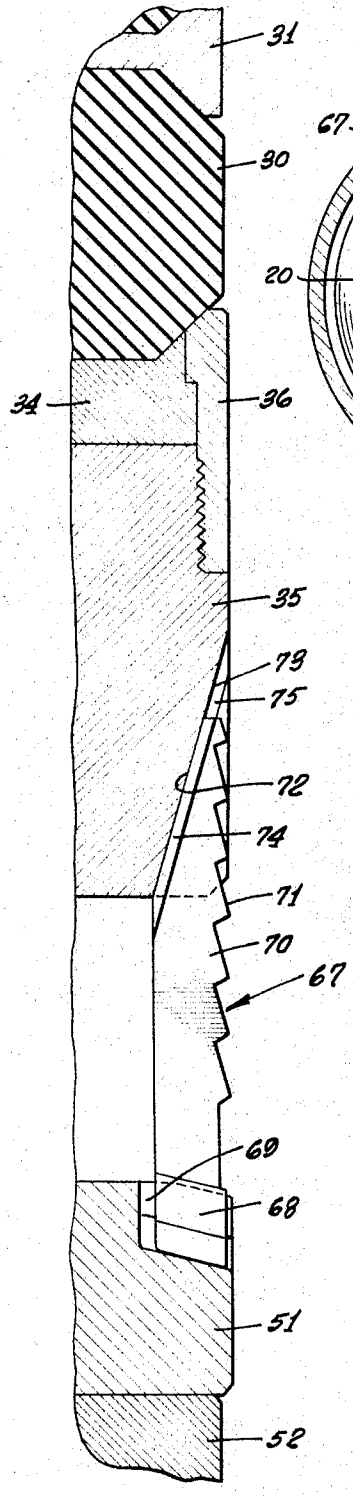


FIG. 9.

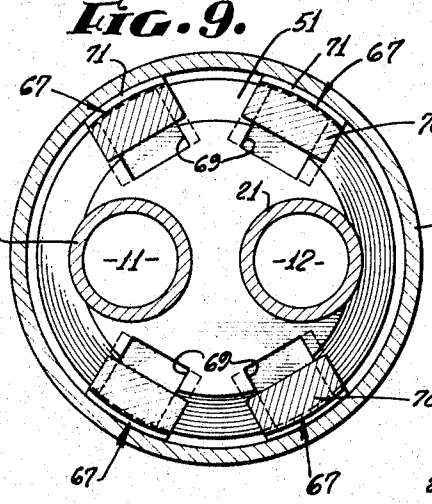


FIG. 10.

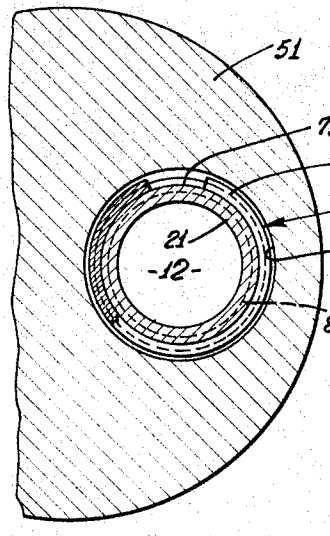
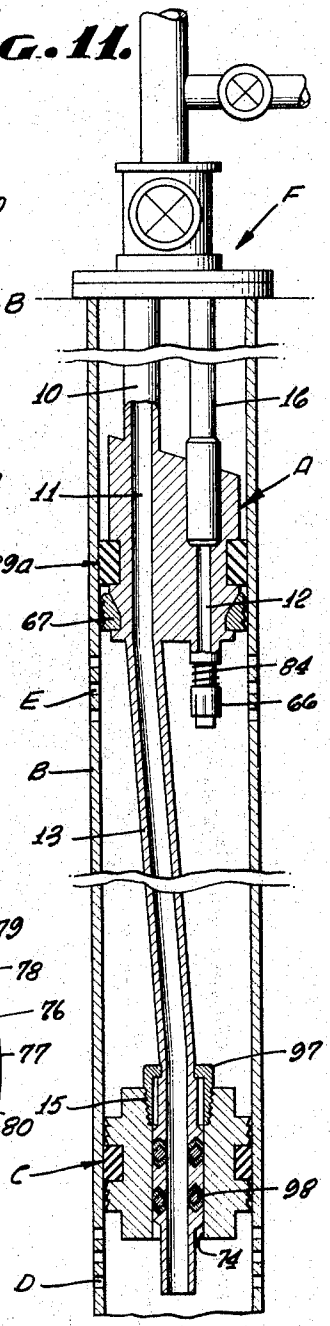


FIG. 11.



INVENTOR.
WILLIAM D. MYERS
by Bernard Kriegel
ATTORNEY

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3,335,800

RETRIEVABLE PARALLEL STRING WELL PACKER APPARATUS

William D. Myers, Houston, Tex., assignor to Baker Oil Tools, Inc., Los Angeles, Calif., a corporation of California

Filed Mar. 8, 1965, Ser. No. 437,802
17 Claims. (Cl. 166—119)

ABSTRACT OF THE DISCLOSURE

A well packer with parallel tubular body members extending through a normally retracted packing structure and an expander for expanding normally retracted slips against a surrounding well casing, an upward pull and movement of one of the body members acting through a spring to shift the slips upwardly along the expander and outwardly against the casing, such upward movement also expanding the packing structure against the casing, with the spring retaining the slips engaged with the casing.

The present invention relates to subsurface well bore apparatus, and more particularly to well packers adapted to be set in well casings and similar conduit strings disposed in well bores.

A plurality of parallel tubular strings extending to the top of the well bore have been associated with a well packer provided with a plurality of parallel passages therethru, the packer being set in a well bore and coacting with the tubular strings to conduct fluids from separate locations in the well bore through separate paths to the top of the hole. Packers of the type indicated, which, for example, are illustrated in my United States Patent No. 3,094,168, are run in the well bore on a first or long tubular string to a desired setting location, after which a second or "short" tubular string is lowered in the well bore and operatively connected to the packer. The packer has been set by imposing set down weight on the second or short tubular string, on the first or long tubular string, or on both tubular strings. In each case, one or both of the tubular strings remains in compression to retain the packer in its set condition. Elevation of one or both tubular strings while connected to the packer will effect release of the latter from the well bore. Under some well conditions, appropriate setting of the well packer cannot be obtained by setting down weight on one or both of the tubular strings, or the imposition of set down weight is not desirable.

Accordingly, it is an object of the present invention to provide a parallel string well packer in which the packer can be set in a well bore by placing the second or short tubular string in tension, rather than in compression.

Another object of the invention is to provide a parallel string well packer in which the well packer can be set by applying tension to the second or short tubular string, and in which the packer can remain in its set condition with both the first and second tubular strings in tension. The maintenance of one or both tubular strings in tension eliminates their buckling and breathing in a pumping installation, and also facilitates movement of wire line and other devices through the tubular strings.

An additional object of the invention is to provide a parallel string well packer which can be set by the application of tension on the second or short tubular string, and which can thereafter be held in set condition, or reset, by compression on the second or short tubular string.

A further object of the invention is to provide apparatus adapted to be lowered in a well bore including a parallel string well packer capable of being set by imposing tension in the second or short tubular string, and in which such tubular string can be disconnected from the set packer, if

desired, which will remain in its set condition in the well bore.

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 elevational view of a well packer apparatus embodying the invention;

FIGURES 2*a* and 2*b* together constitute an enlarged longitudinal section through the well packer disclosed in FIG. 1, with its parts in retracted position, FIG. 2*b* being a lower continuation of FIG. 2*a*;

FIGS. 3*a* and 3*b* are views corresponding to FIGS. 2*a* and 2*b*, disclosing the well packer disposed in a well casing and with the short string in place, the latching mechanism of the well packer having been released for setting of the slips against the well casing, FIG. 3*b* being a lower continuation of FIG. 3*a*;

FIGS. 4*a* and 4*b* are views corresponding to FIGS. 2*a* and 2*b*, in which the well packer has been anchored in packed-off condition in the well casing, FIG. 4*b* being a lower continuation of FIG. 4*a*;

FIG. 5 is an enlarged fragmentary longitudinal section illustrating the slip portion of the well packer locked in its retracted position;

FIG. 6 is a view similar to FIG. 5 illustrating certain packer parts after the slips have been released and initially expanded against the casing;

FIG. 7 is a view similar to FIGS. 5 and 6, in which the slips are fully set and the packer parts have been shifted to still another position;

FIG. 8 is an enlarged longitudinal section taken along the line **8—8** on FIG. 1;

FIG. 9 is an enlarged section taken along the line **9—9** on FIG. 2*b*;

FIG. 10 is an enlarged section taken along the line **10—10** on FIG. 2*b*;

FIG. 11 is a diagrammatic view illustrating the well packer apparatus of FIGS. 1 to 10, inclusive, anchored in packed-off condition in a well casing in association with a lower well packer set in the well casing.

The well packer A disclosed in the drawings is adapted to be lowered in a well casing B on a first or long tubular string **10**, and may be placed in proper association with a lower well packer C previously set in the well casing, as disclosed diagrammatically in FIG. 11. This lower well packer may be of a permanent or retrievable type and is anchored in packed-off condition in the well casing above a set of lower casing perforation D communicating with a lower producing zone in the well bore. The upper well packer A is adapted to be anchored in packed-off condition in the well casing above an upper set of perforations E confronting an upper producing zone in the well bore, this upper packer having a plurality, such as a pair, of fluid passages **11**, **12** therethrough, one of which **11** communicates with the first or long tubular string **10**, the lower end of the passage **11** also communicating with a string of tubing **13** extending to the lower packer C and sealed off within the bore **14** of the latter. Such tubing **13** may also be suitably coupled to a threaded box portion **15** of the lower packer whereby the tubing may be placed in tension, as described hereinbelow. The other passage **12** of the upper well packer communicates with a second tubular string **16** extending to the top of the well bore.

The production fluid from the lower producing zone is conducted through the lower perforations D and into the lower tubing 13 sealed within the bore 14 of the lower packer, passing upwardly therethrough and through the first passage 11 to the first tubular string 10, to be conducted thereby to the top of the hole. The production from the upper zone passes through the upper perforation E and into the second passage 12 which communicates with the second or short tubular string 16 extending to the top of the well bore. The tubular strings are suitably secured to surface connections F that will control the flow of fluids therefrom.

The well packer A includes a pair of parallel tubular body members or mandrels 20, 21 that are movable together in the well casing. A first tubular body or mandrel 20 passes slidably through a bore 22 in an upper guide 23 and through an upper connector 24, to which it is attached. As shown, a ring 25 is disposed in a peripheral groove 26 in the first tubular body member and this ring is received in a lower counterbore 27 in the upper connector, the ring also bearing against an upper insert 28 which is clamped against the ring 25 and the upper connector 24 by an upper gauge ring 29 threadedly secured to the upper connector. The first body member or mandrel 20 extends downwardly through a packing structure 29*a* which includes the upper insert 28 and the gauge ring 29, the packing structure including a plurality of packing elements 30 of pliant, elastic material, such as rubber, and intervening spacer rings 31, the first body member extending through aligned bores 32 in the latter as well as through a bore 33 in a lower insert 34 which is clamped against the upper end of an expander 35 by a lower gauge ring 36 threaded to the expander.

The second body member 21 extends slidably through aligned bores 37 in the packing structure or assembly 29*a*, as well as through the upper connector 24, the upper end of the second body being threadedly secured to a receptacle 38, the upper end of which is threadedly secured to the guide 23, which has a tapered surface 39 tapering in a downwardly direction from the first body member 20 toward the axis of the second body member 21. The short or second tubular string 16 is adapted to be lowered in the well casing into engagement with the guide 23, being directed toward the second passage 12 through the second body member and receptacle by the tapered surface 39, and entering the guide and receptacle, there being a suitable seal ring or structure 40 on the lower sub portion 41 of the short string adapted to sealingly engage the wall of the receptacle 38. The sub 41 has one or a plurality of pins 42 projecting radially therefrom adapted to engage the incline ends 43 of a sleeve 44 inserted within a counterbore 45 in the guide, and suitably secured thereto, as by welding material 46, the pin 42 being directed automatically down the incline portions of a locking slot 47 in the sleeve into a position below a hook 48 in the upper portion of the sleeve. When the pin 42 is disposed under the hook 48, the seal structure 40 is disposed in sealing relation fully within the receptacle 38, and the short string 16 is thereby coupled to the guide 23, receptacle 38 and second body member 21 by virtue of the engagement of the pin 42 with the hook portion 48 of the sleeve welded to the guide.

The first and second body members 20, 21 both extend freely downwardly through the slip expander 35 and also through parallel bores 50 in a slip ring 51 and a slip ring retainer 52 secured to the slip ring by one or more longitudinally extending screws 53. Both body members continue to extend downwardly through a retainer ring 54 spaced below the slip ring retainer 52, and through a bottom connector 55 engaging the lower end of the retainer ring 54, the connector 55 being secured to the retainer 54 by a plurality of longitudinal screws 53'.

The first body member 20 is attached to the retainer 54 and bottom connector 55 by a coupling ring 56 mounted in a peripheral groove 57 in the body and engaging a downwardly facing shoulder 58 of the retainer, a nut 59 being threaded within the bottom connector and engaging the lower end of the coupling ring 56 so as to clamp the latter to the retainer. The second body member 21, however, is slidable through the retainer 54 and bottom connector 55, and is movable in an upward direction therein in effecting setting of the well packer in the well casing. Initially, the second body member 21 is prevented from moving upwardly by virtue of a control ring 60 mounted in a groove 61 in the second body member and engageable with the lower inclined surfaces 62 of inwardly extending feet 63 forming the lower portion of spring-like leg members 64 integral with a circumferentially continuous portion 65 of a latch sleeve 66, the upper end of which is threadedly secured to the bottom connector 55.

Displaced from a plane including the axes of the two tubular body members 20, 21, and on opposite sides thereof, are slips 67 carried by the slip ring 51 and adapted to coact with the expander 35 (FIGS. 1, 8, 9). As shown, a pair of slips 67 is disposed on each side of the aforementioned central plane. Each slip is coupled to the slip ring 51 for longitudinal movement therewith, but the slips can move radially of the slip ring from a retracted position into engagement with the well casing B, and back to a retracted position. The lower portions of the slips are formed as T-shaped heads 68 slidably mounted in companion generally T-shaped slots 69 in the slip ring. The upper portions of the slips are constituted as anchoring members 70 having downwardly facing wickers or teeth 71 and inner tapered surfaces 72 inclined in a downward and inward direction, being slidable along companion tapered surfaces 73 in the expander 35. As the slip ring 51 and slips 67 move upwardly relative to the expander 35, the slips are shifted radially outwardly into engagement with the well casing. Relative upward movement of the expander 35 with respect to the slip ring 51 and slips 67 will result in inward movement of the slips from the well casing. This occurs as a result of providing side tongues 74 on each slip parallel to its tapered surface 72, which ride in companion grooves 75 in the expander, forming a slidable tongue and groove connection between the expander and each slip and insuring positive retraction of each slip when the expander moves away from the slip ring 51.

Initially, the slips 67 and packing structure 29*a* are in their retracted positions being retained in such positions during lowering of the upper packer apparatus in the well casing by the lower latch sleeve 66 and control ring 60 device, and by a lock device 76 that initially couples the slip ring 51 and slip ring retainer 52 to the second body member 21. As disclosed, an internal groove 77 is provided within the slip ring 51 in which an inherently retractable split retaining ring 78 is disposed initially, this split retaining ring also being located initially within an upper recess 79 in the second body member that merges into a peripheral groove 80 in the body member, the slip ring retainer 52 engaging the lower end of the retaining ring 78, which prevents the slip ring retainer 52, slip ring 51, and slips 67 from shifting upwardly along the second body member 21 and toward the expander 35. These parts are shiftable upwardly of the second body member 21 by a spring mechanism, including a spring seat sleeve 81 engaging a coupling ring 82 mounted in a peripheral groove 83 in the second body member. A compression spring 84 encompasses the second body member, its lower end bearing against the spring seat sleeve 81 and its upper end bearing against a thrust sleeve 85 engaging the lower end of the slip ring retainer 52. This thrust sleeve has an upper counterbore 86 in which a ring 87 is received, the ring bearing against a downwardly facing shoulder 88 of an elongate peripheral groove 89 in the second body member.

The compression spring 84 is pre-loaded, that is, it is placed under compression, and urges the thrust sleeve 85

upwardly of the second body member 21. However, it is, at first, incapable of moving in an upward direction, being prevented from doing so by the ring 87 and the engagement of the latter with the downwardly facing shoulder 88 of the second body member.

The second body member 21 also has a ring 90 mounted in its peripheral groove 91 and slidable within its associated bore 92 through the expander 35, this ring being disposed initially a short distance below the lower insert ring 34 of the packing assembly 29*a*. Similarly, the first body member 20 has a ring 93 mounted in its peripheral groove 94 which initially contacts the lower insert member 34, which ring is slidable downwardly within an enlarged bore 95 through the expander 35, so that the expander can move relatively upwardly along the ring 93 and the first body member 20.

A typical use of the upper well packer A is illustrated in FIG. 11 in conjunction with the lower well packer C, which has been previously set between the upper and lower perforations E, D in the well casing B, although it is to be understood that the upper well packer and lower well packer can, if desired, be run in the well casing at the same time. The required length of intermediate tubing 13 is secured, as through a coupling 96, to the lower end of the first body member 20, this tubing preferably having a known latch device 97 at its lower portion and suitable lower seals 98 so that, upon lowering of the upper well packer on the tubular string 10, the seal portion 98 of the tubing will be disposed in sealing relation within the bore 14 of the lower packer C, and its latch coupling 97 releasably latched or secured to the threaded box 15 of the lower packer, the upper packer then being located at the desired point in the well casing above the upper set of casing perforation E.

During lowering of the upper well packer A on the first or long tubular string 10, the control ring 60 is disposed below the latch feet 63 so that the parts of the apparatus cannot move relatively, the packing structure or assembly 29*a* remaining in its retracted position, which is also true of the slips 67. The downward force is transmitted through the first tubular member 20 and its lower coupling ring 56 to the bottom connector 54 and through the latch sleeve 66 to the control ring 60 on the second body member 21, pulling the second body member downwardly in the well bore. Such downward movement is transmitted through the split retaining ring 78 to the slip ring retainer 52 and slip ring 51 secured thereto through the screws 53, resulting in a downward pulling of the slips 67 with the body members 20, 21 and a prevention of relative upward movement of the slips along the expander 35. The compression spring 84, which has been pre-compressed to a desired extent, cannot expand since its upward force is transmitted through the thrust sleeve 85 to the coupling ring 87 and second body member 21.

After the tubing 13 has been disposed within the lower packer C and its latch coupling 97 secured thereto, the second or short tubular string 16 is lowered in the well bore, its lower end engaging the tapered upper surface 39 of the guide 23, which will steer the lower end of the short string into the guide bore and receptacle 38, the lock pins 45 on the short string sub 41 engaging the incline surfaces 43 of the lock sleeve to automatically steer the pins into and under the sleeve hooks 48, at which time the seal ring 40 of the sub is in sealing relation to the receptacle 38. An upward pull can now be taken on the second or short tubular string 16, the upper connector 24, upper insert 28 and gauge ring 29 being prevented from moving upwardly by being coupled to the first body member 20, which is coupled through the tubing 13 to the lower anchored well packer C. The securing of the first tubular body member to the lower packer will prevent the lower retainer 54, bottom connector 55, and latch sleeve 66 from moving upwardly. Accordingly, when sufficient upward force is imposed on the short tubular string 16, the control ring 60 will engage the inclined lower surfaces 62 of the latch sleeve, expanding the feet 63 and legs 64 outwardly, the control ring 60 shifting above the inwardly directed feet 63 and within the latch sleeve 66. Such upward movement will move the second body member 21 upwardly within the slip ring 51 and the slip ring retainer 52, placing the second body groove 80 opposite the inherently retractable split retaining ring 78, which will then retract into the groove 80 and fuly within the confine of the second body member 21, and which will also elevate the shoulder 88 at the upper end of the elongate groove 89 of the second body member above the ring 87 that engages the thrust sleeve 85. As a result, the compression spring 84 is permitted to expand and will shift the thrust sleeve 85, slip ring retainer 52, and slip ring 51 upwardly to move the slips 67 upwardly along the expander 35 and outwardly into engagement with the wall of the well casing.

The short string 16 and second body member 21 can continue to move up until the ring 90 on the second body member engages the lower insert member 34. At this time, however, the compression spring 84 will have shifted the slips 67 securely outwardly against the casing so that their teeth or wickers 71 snugly engage the casing. As the second body meber 21 continues to move upwardly, its coupling ring 90 will engage the lower insert 34 and move the lower insert, lower gauge ring 36 and expander 35 upwardly with it toward the upper insert 28, upper gauge ring 29 and upper connector 24, to shorten the packing structure or assembly 29*a* and expand the packing elements 30 outwardly into sealing engagement with the wall of the well casing B. As was noted above, the upper connector, upper insert and upper gauge ring are prevented from moving upwardly by being coupled to the first body member 20, which is secured to the lower packer C through the agency of the intervening tubing string 13.

As the second body member 21 moves upwardly, it carries the spring seat sleeve 81 upwardly with it, the compression spring 84 remaining under a substantial degree of compression and sliding the slips 67 upwardly along the well casing as the expander 35 moves upwardly with the lower insert 34 and lower gauge ring 36. When sufficient tension has been imposed upon the second or short tubular string 16 to insure that the packing assembly 29*a* is firmly sealed against the wall of the well casing, the upper tensile pull can be relieved, if desired, and the slips 67, with the expander 35 wedged behind them, will prevent downward shifting of the packer apparatus A, which has now been anchored in packed-off condition in the well casing.

Fluid from the lower zone can now pass through the lower perforations D and through the tubing 13 and first passage 11 into the first or long tubular string 10, to be conducted to the top of the well bore. Fluid from the upper zone can pass through the upper perforations E into the well casing B and upwardly through the second passage 12 and the second or shoft tubular string 16 to the top of the well bore, the surface connections F having previously been made to the tubing strings 10, 16 at the top of the hole.

After the upper well packer A has been set, the second or short tubular string 16, guide 23, receptacle 38, and the second tubular body member 21 can, if desired, be lowered, the guide sliding downwardly along the first body member 20 until the receptacle engages the upper connector 24. The set condition of the upper packer A will not be disturbed, since the slips 67, by being anchored to the well casing against downward movement therewithin will prevent such disturbance. The receptacle 38 can engage the upper connector 24, if desired, and downweight imposed upon the short string 16. If desired, the short string 16 can be placed in a neutral condition, that is, one in which it is not imposing either a tensile pull or a compressive force on the guide, receptacle, sec-

ond body member, and the other parts of the apparatus.

If the length of the tubing 13 between the upper and lower packers A, C is sufficient to apply enough weight or downwardly directed load on the first body member 20, it is unnecessary to provide the releasable latch 97 for coupling the tubing 13 to the lower packer C, since the weight of the tubing will furnish sufficient resistance to upward movement of the upper connector 24, upper insert 28 and upper gauge ring 29 upon upward pulling of the second body member 21, in order to set the upper packer A by taking a tensile pull upon the short string.

The upper packer specifically illustrated finds use in shallow wells where there is insufficient length of weight of tubing 13 to set a compression type packer, such as disclosed in United States Patent No. 3,094,168. It is also useful where wire line work would become troublesome in the event of compression in the short tubing string 16, long tubing string 10, or both. In addition, if a pump mechanism is disposed in either the long or short string 10, 16, or both, they can both be maintained in tension, which will eliminate their buckling and breathing as the pumping devices are reciprocated by the sucker rods (not shown) usually associated with down hole pumping apparatus.

At any time after the upper packer has been set in packed-off condition in the well casing, the second or short tubular string 16 can be disconnected therefrom without affecting the set condition of the well packer A, since the tubing 13 between the packers A, C is coupled to the lower packer, or has sufficient weight, in and of itself to provide adequate downweight to hold the packing assembly 29*a* expanded against the casing, and act through the expander 35 to maintain the slips 67 anchored against the wall of the well casing. For that matter, the first or long tubular string 10 could also be disconnected from the first body member 20 and removed from the well casing, the intervening tubing 13 holding the packer C packed-off in the well casing.

In the event it is desired to retrieve the upper packer, the tension on the short string 16 is relieved, or, for that matter, a downward force can be imposed by it upon the guide 23, to shift the second body member 21 back to its initial position, the control ring 60 engaging the latch feet 63 and expanding them and their associated legs 64 outwardly until the control ring is again disposed below the feet, which will releasably retain the body 21 in its lower position. The downward shifting of the body 21 allows the compression spring 84 to expand and move the spring seat sleeve 81 in a downward direction, the shoulder 88 on the second body member engaging the ring 87 and shifting the thrust sleeve 85 downwardly against the force of the spring, to relieve the slips 68 of any upward force tending to hold them upwardly and laterally outwardly of the expander 35. With the second body member 21 relatched in its initial position, the short string 16 can be turned to the right and elevated, the pins 42 moving out of the locking slots 47, which will allow the short string 16 to be elevated in the well casing B and removed entirely therefrom.

The first or long tubular string 10 can now be elevated, such elevating movement first moving the upper connector 24, upper insert 28 and upper gauge ring 29 away from the lower insert 34, gauge ring 36 and expander 35, to allow the inherently contractable packing elements 30 to retract from the well casing and return to their initial positions. The ring 93 on the first body member will then engage the lower insert 34 and act through the lower gauge ring 36 to elevate the expander 35 upwardly of the slips 67, the latter being pulled radially inwardly upon upward movement of the expander relative thereto by virtue of their tongue and groove interconnections 74, 75. If the latch coupling 97 on the tubing 13 has not been used, the long string 10 can be elevated in the well casing to remove the well packer A therefrom together with the depending tubing string 13. If, however, the latch coupling 97 has been stabbed into the threaded box 15 of the lower packer C, the long string is rotated to turn the tubing 13 and unthread the latch coupling 97 from the threaded box 15. Ordinarily, the latch coupling and threaded box have left-hand threads, so that right hand rotation of the long string 10 will result in upward threading of the coupling 97 from and out of the threaded box of the lower packer.

I claim:

1. In a well tool adapted to be disposed in a well bore: first and second generally parallel tubular body members; normally retracted means on said members and expandable laterally outwardly into engagement with the wall of the well bore; first means on said first member engaging the upper portion of said normally retracted means; second means on said second member engaging the lower portion of said normally retracted means, said second member being slidable upwardly through said first means whereby upward movement of said second member relative to said first member shifts said second means toward said first means to expand said normally retracted means laterally outwardly; and means on said second member engageable with said first means to transmit downward movement of said second member to said normally retracted means to hold said normally retracted means expanded laterally outwardly.

2. In a well tool adapted to be disposed in a well bore: first and second generally parallel tubular body members; normally retracted means on said members and expandable laterally outwardly into engagement with the wall of the well bore; first means on said first member engaging the upper portion of said normally retracted means; second means on said second member engaging the lower portion of said normally retracted means, said second member being slidable upwardly through said first means whereby upward movement of said second member relative to said first member shifts said second means toward said first means to expand said normally retracted means laterally outwardly; means on said second member engageable with said first means to transmit downward movement of said second member to said normally retracted means to hold said normally retracted means expanded laterally outwardly; and releasable latch means on said members initially preventing upward movement of said second member relative to said first member and releasable upon exertion of a predetermined upward pull on said second member.

3. In a well tool adapted to be disposed in a well bore: first and second generally parallel tubular body members; an expander on said body members; slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander; first means on said first member above and engaging the upper portion of said expander; second means on said second member below and engaging the lower portion of said slip means; said second member being slidable upwardly through said first means whereby upward movement of said second member relative to said first member shifts said slip means upwardly along said expander and laterally outwardly; and means on said second member above and engageble with said first means to transmit downward movement of said second member to said expander to hold said slip means expanded laterally outwardly.

4. In a well tool adapted to be disposed in a well bore: first and second generally parallel tubular body members; an expander on said body members; slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander; first means on said first member above and engaging the upper portion of said expander; second means on said second member below and engaging the lower portion of said slip means; said second member being slidable upwardly through said first means whereby upward movement of said second member relative to said first member shifts said slip means upwardly along said

expander and laterally outwardly; means on said second member above and engageable with said first means to transmit downward movement of said second member to said expander to hold said slip means expanded laterally outwardly; and releasable coengageable latch means on said members initiailly preventing upward movement of said second member relative to said first member and releasable upon exertion of a predetermined upward pull on said second member.

5. In a well tool adapted to be disposed in a well bore: first and second generally parallel tubular body members; an expander on said body members; slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander; an initially retracted packing structure on said members above and engaging said expander; first means on said first member engaging the upper portion of said packing structure; second means on said second member below and engaging the lower portion of said slip means; said second member being slidable upwardly through said expander and packing structure whereby upward movement of said second member relative to said first member shifts said slip means along said expander and laterally outwardly and shortens said packing structure and expands such structure laterally outwardly; and means on said second member above and engageable with said packing structure to transmit downward movement of said second member to said packing structure and expander to hold such structure and slip means expanded laterally outwardly.

6. In a well tool adapted to be disposed in a well bore: first and second generally parallel tubular body members; an expander on said body members; slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander; an initially retracted packing structure on said members above and engaging said expander; first means on said first member engaging the upper portion of said packing structure; second means on said second member below and engaging the lower portion of said slip means; said second member being slidable upwardly through said expander and packing structure whereby upward movement of said second member relative to said first member shifts said slip means along said expander and laterally outwardly and shortens said packing structure and expands such structure laterally outwardly; means on said second member above and engageable with said packing structure to transmit downward movement of said second member to said packing structure and expander to hold such structure and slip means expanded laterally outwardly; and releasable coengageable latch means on said members initially preventing upward movement of said second member relative to said first member and releasable upon exertion of predetermined upward pull on said second member.

7. In a well tool adapted to be disposed in a well bore: first and second generally parallel tubular body members; normally retracted means on said members and expandable laterally outwardly against the wall of the well bore; first means on said first member engaging the upper portion of said normally retracted means; second means on said second member engaging the lower portion of said normally retracted means; spring means on said second member engaging said second means and tending to shift said second means upwardly of said second member toward said first means to expand said normally retracted means laterally outwardly; said second member being movable upwardly through said first means and relative to said first member; and releasable lock means preventing expansion of said spring means and releasable in response to upward movement of said second member relative to said first member.

8. In a well tool adapted to be disposed in a well bore: first and second generally parallel tubular body members; normally retracted means on said members and expandable laterally outwardly against the wall of the well bore; first means on said first member engaging the upper portion of said normally retracted means, second means on said second member engaging the lower portion of said normally retracted means; spring means on said second member engaging said second means and tending to shift said second means upwardly of said second member toward said first means to expand said normally retracted means laterally outwardly; said second member being movable upwardly through said first means and relative to said first member; releasable lock means preventing expansion of said spring means and releasable in response to upward movement of said second member relative to said first member; and releasable coengageable latch means on said members initially preventing upward movement of said second member relative to said first member and releasable upon exertion of a predetermined upward pull on said second member.

9. In a well packer adapted to be disposed in a well bore: first and second generally parallel tubular body members; an expander on said body members; slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander; an initially retracted packing structure on said members above and engaging said expander; first means on said first member engaging the upper portion of said packing structure; second means on said second member below and engaging the lower portion of said slip means; spring means on said second member engaging said second means and tending to shift said second means upwardly of said expander to expand said slip means laterally outwardly; said second member being slidable upwardly through said expander and packing structure and relative to said first member; releasable lock means preventing expansion of said spring means and releasable in response to upward movement of said second member relative to said first member; and means on said second body member engaging the lower portion of said packing structure to move said lower portion toward said first means and shorten such packing structure and expand such structure laterally outwardly.

10. In a well packer adapted to be disposed in a well bore: first and second generally parallel tubular body members; an expander on said body members; slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander; an initially retracted packing structure on said members above and engaging said expander; first means on said first member engaging the upper portion of said packing structure; second means on said second member below and engaging the lower portion of said slip means; spring means on said second member engaging said second means and tending to shift said second means upwardly of said expander to expand said slip means laterally outwardly; said second member being slidable upwardly through said expander and packing structure and relative to said first member; releasable lock means preventing expansion of said spring means and releasable in response to upward movement of said second member relative to said first member; means on said second body member engaging the lower portion of said packing structure to move said lower portion toward said first means and shorten such packing structure and expand such structure laterally outwardly; and releasable coengageable latch means on said members initially preventing upward movement of said second member relative to said first member and releasable upon exertion of a predetermined upward pull on said second member.

11. In well apparatus adapted to be disposed in a well bore: a well device including first and second generally parallel tubular body members, a guide member slidable relatively on said first body member and secured to the upper portion of said second body member, said guide member having a passage communicating with the interior of said second body member, normally retracted means

on said members and expandable laterally outwardly, first means on said first member engaging the upper portion of said normally retracted means, second means on said second member engaging the lower portion of said normally retracted means, said second member being movable upwardly of said first member and first means; a first tubular string connected to said first body member for lowering the well device in the well bore; a second tubular string adapted to be lowered in the well bore into engagement with said guide member to be guided thereby into said passage; and coengageable means on said second string and guide member for transmitting upward movement of said second string to said second body member to shift said second means upwardly toward said first means and expand said normally retracted means laterally outwardly.

12. In well apparatus adapted to be disposed in a well bore: a well device including first and second generally parallel tubular body members, a guide member slidable relatively on said first body member and secured to the upper portion of said second body member, said guide member having a passage communicating with the interior of said second body member, an expander on said body members, slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander, first means on said first member above and engaging the upper portion of said expander, second means on said second member below and engaging the lower portion of said slip means, said second member being movable upwardly of said first member and first means; a first tubular string connected to said first body member for lowering the well device in the well bore; a second tubular string adapted to be lowered in the well bore into engagement with said guide member to be guided thereby into said passage; and coengageable means on said second string and guide member for transmitting upward movement of said second string to said second body member to shift said slip means upwardly along said expander and laterally outwardly.

13. In a well apparatus adapted to be disposed in a well bore: a well device including first and second generally parallel tubular body members, a guide member slidable relatively on said first body member and secured to the upper portion of said second body member, said guide member having a passage communicating with the interior of said second body member, an expander on said body members, slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander, an initially retracted packing structure on said members above and engaging said expander, first means on said first member engaging the upper portion of said packing structure, second means on said second member below and engaging the lower portion of said slip means, said second member being slidable upwardly through said expander and packing structure an also being movable upwardly of said first member and first means; a first tubular string connected to said first body member for lowering the well device in the well bore; a second tubular string adapted to be lowered in the well bore into engagement with said guide member to be guided thereby into said passage; and coengageable means on said second string and guide member for transmitting upward movement of said second string to said second body member to shift said slip means upwardly along said expander and laterally outwardly and to shorten said packing structure and expand such structure laterally outwardly.

14. In well apparatus adapted to be disposed in a well bore: a well device including first and second generally parallel tubular body members, a guide member slidable relatively on said first body member and secured to the upper portion of said second body member, said guide member having a passage communicating with the interior of said second body member, normally retracted means on said members and expandable laterally outwardly, first means on said first member engaging the upper portion of said normally retracted means, second means on said second means engaging the lower portion of normally retracted means, spring means on said second member engaging said second means and tending to shift said second means upwardly of said second member toward said first means to expand said normally retracted means laterally outwardly, said second member being movable upwardly of said first member and first means; a first tubular string connected to said first body member for lowering the well device in the well bore; a second tubular string adapted to be lowered in the well bore into engagement with said guide member to be guided thereby into said passage; releasable lock means preventing expansion of said spring means; and coengageable means on said second string and guide member for transmitting upward movement of said second string to said second body member to shift said second means upwardly toward said first means and expand said normally retracted means laterally outwardly; said second body member having means thereon releasing said lock means in response to upward movement of said second member relative to said first member.

15. In well apparatus adapted to be disposed in a well bore: a well device including first and second generally parallel tubular body members, a guide member slidable relatively on said first body member and secured to the uppor portion of said second body member, said guide member having a passage communicating with the interior of said second body member, an expander on said body members, slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander, an initially retracted packing structure on said members above and engaging said expander, first means on said first member engaging the upper of said packing structure, spring means on said second member below and engaging the lower portion of said slip means and tending to shift said slip means upwardly of said expander to expand such slip means laterally outwardly, said second member being slidable upwardly through said expander and packing structure and movable upwardly relative to said first member, releasable lock means preventing expansion of said spring means and releasable in response to upward movement of said second member relative to said first member; a first tubular string connected to said first body member for lowering the well device in the well bore; a second tubular string adapted to be lowered in the well bore into engagement with said guide member to be guided thereby into said passage; and coengageable means on said second string and guide member for transmitting upward movement of said second string to said second body member to release said releasable lock means and shift said second member upwardly relative to said first member to shift said slip means upwardly along said expander and laterally outwardly and shorten said packing structure and expand such structure laterally outwardly.

16. In well apparatus adapted to be disposed in a well bore: a well device including first and second generally parallel tubular body members, a guide member slidable relatively on said first body member and secured to the upper portion of said second body member, said guide member having a passage communicating with the interior of said second body member, an expander on said body members, slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander, an initially retracted packing structure on said members above and engaging said expander, first means on said first member engaging the upper portion of said packing structure, spring means on said second member below and engaging the lower portion of said slip means and tending to shift said slip means upwardly of said expander to expand

such slip means laterally outwardly, said second member being slidable upwardly through said expander and packing structure and movable upwardly relative to said first member, releasable lock means preventing expansion of said spring means and releasable in response to upward movement of said second member relative to said first member; a first tubular string connected to said body member for lowering the well device in the well bore; a second tubular string adapted to be lowered in the well bore into engagement with said guide member to be guided thereby into said passage; coengageable means on said second string and guide member for transmitting upward movement of said second string to said second body member to release said releasable lock means and shift said second member upwardly relative to said first member to shift said slip means upwardly along said expander and laterally outwardly and shorten said packing structure and expand such structure laterally outwardly; and releasable coengageable latch means on said members initially preventing upward movement of said second member relative to said first member and releasable upon exertion of a predetermined upward pull on said second tubular string and second member.

17. In a well apparatus adapted to be disposed in a well bore: a lower packer adapted to be set in the well bore; an upper well packer including first and second generally parallel tubular body members, a guide member slidable relatively on said first body member and secured to the upper portion of said second body member, said guide member having a passage communicating with the interior of said second body member, tubular means connected to the lower portion of said first body member and adapted to sealingly engage said lower packer, an expander on said body members, slip means engageable with said expander and movable laterally outwardly upon movement of said slip means upwardly of said expander, an initially retracted packing structure on said members above and engaging said expander, first means on the first member engaging the upper portion of said packing structure, second means on said second member below and engaging the lower portion of said slip means, said second member being slidable upwardly through said expander and packing structure; a first tubular string connected to said first body member for lowering the upper well packer in the well bore; a second tubular string adapted to be lowered in the well bore into engagement with said guide member to be guided thereby into said passage; and coengageable means on said second string and guide member for transmitting upward movement of said second string to said second body member to shift said second body member upwardly of said first body member and shift said slip means upwardly along said expander and laterally outwardly and shorten said packing structure and expand said structure laterally outwardly.

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CHARLES E. O'CONNELL, *Primary Examiner.*

JAMES A. LEPPINK, *Examiner.*