

Feb. 27, 1968

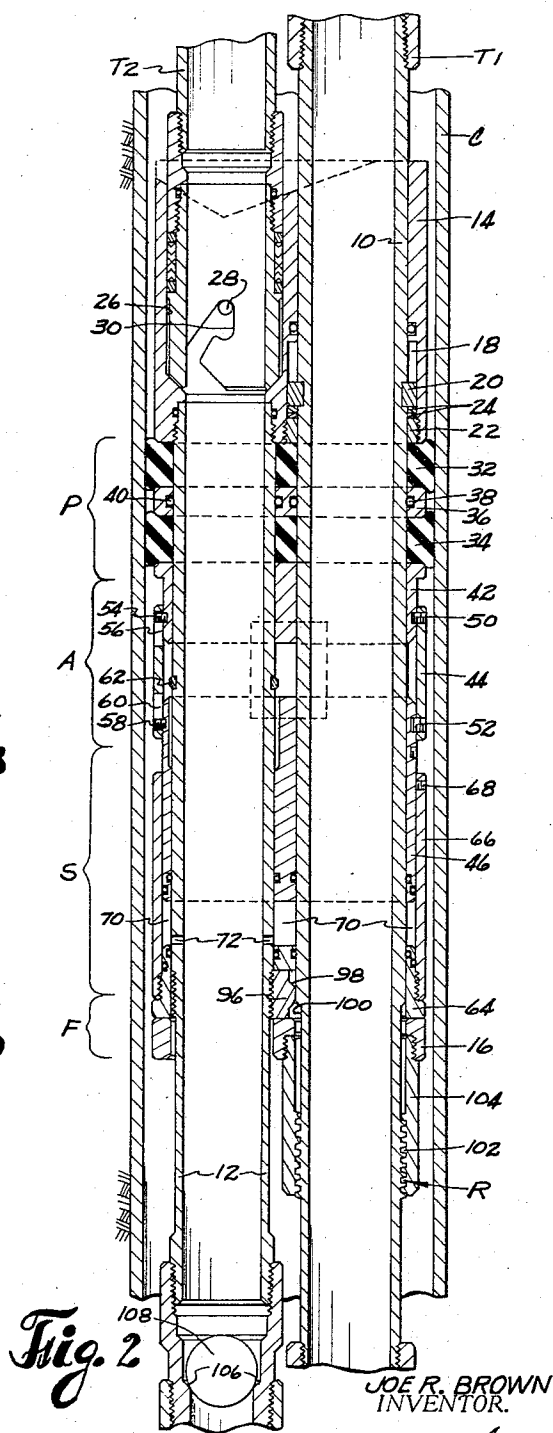
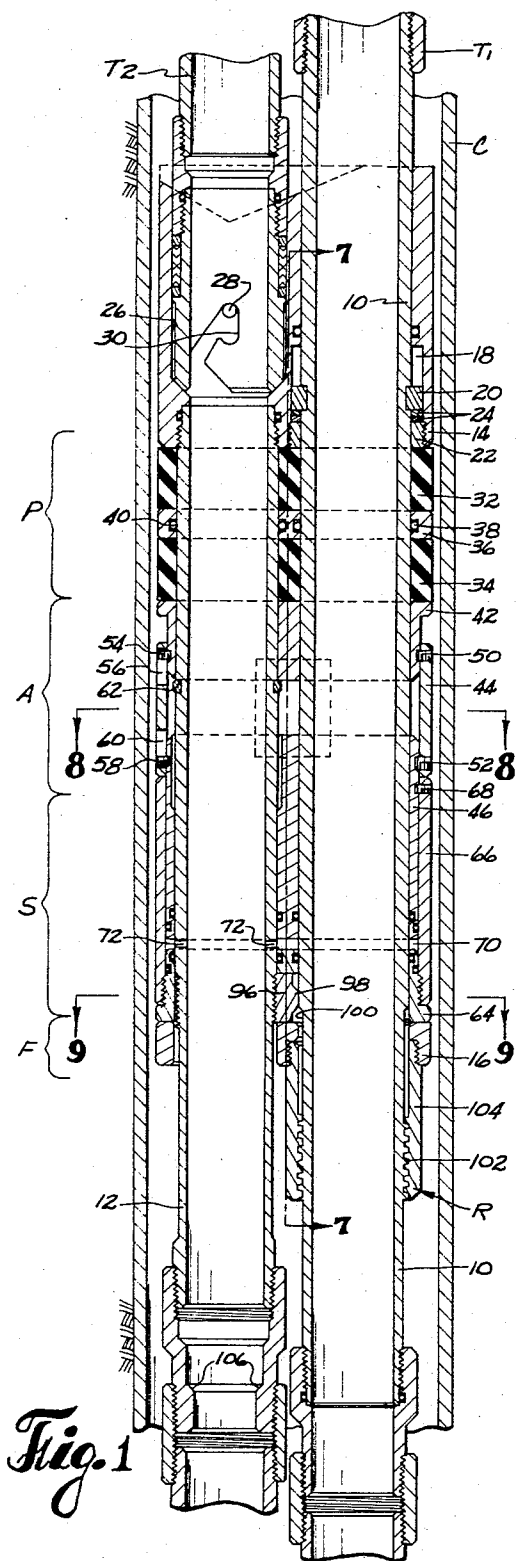
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3,370,651

WELL PACKER

Filed April 1, 1966

6 Sheets-Sheet 1



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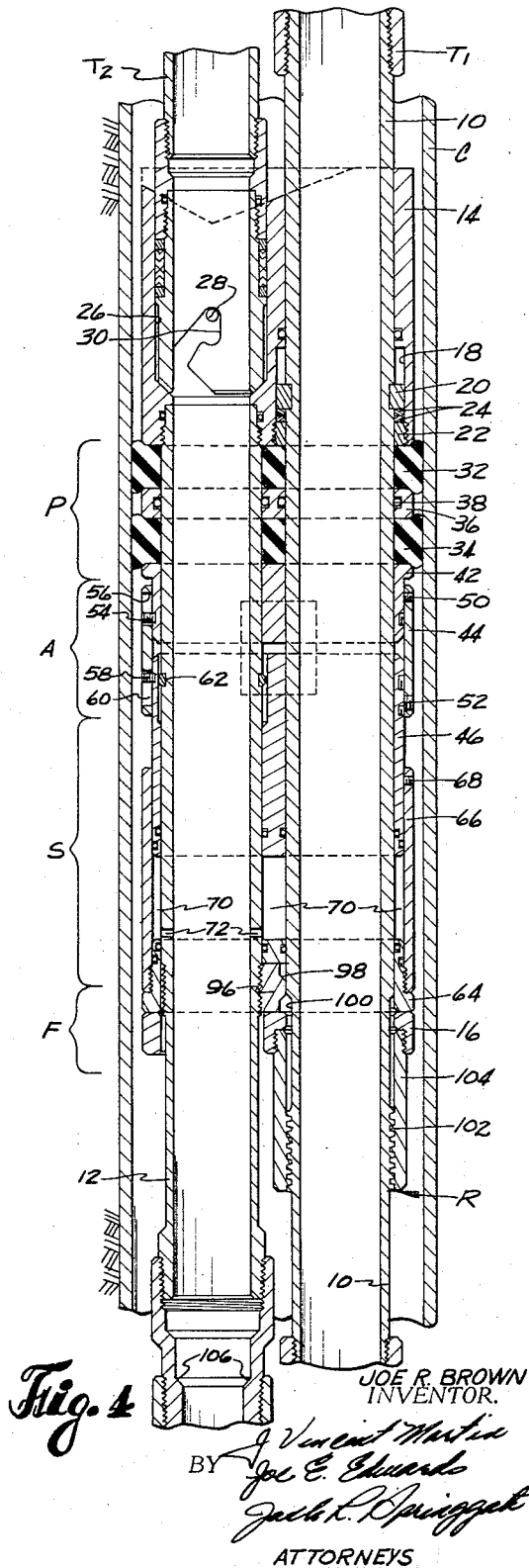
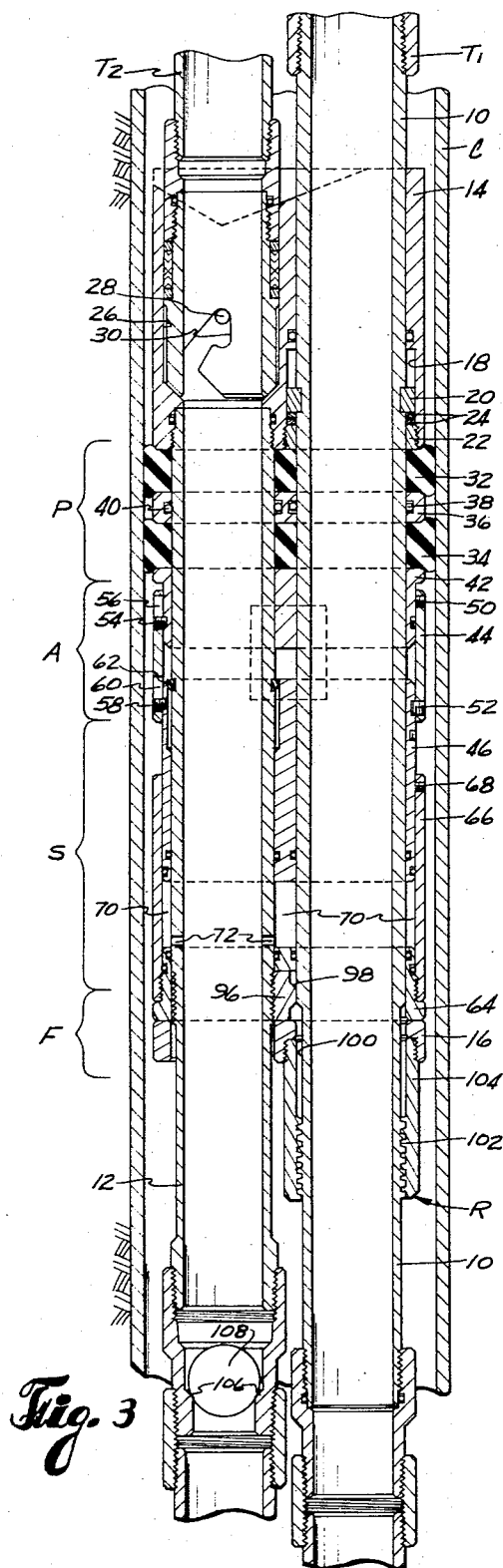
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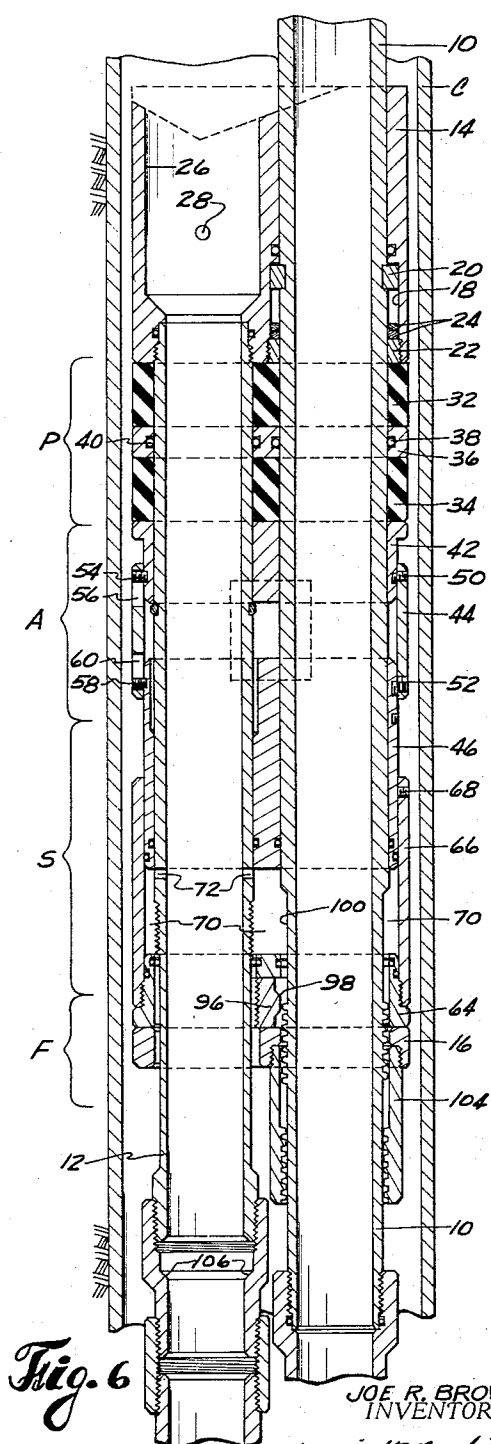
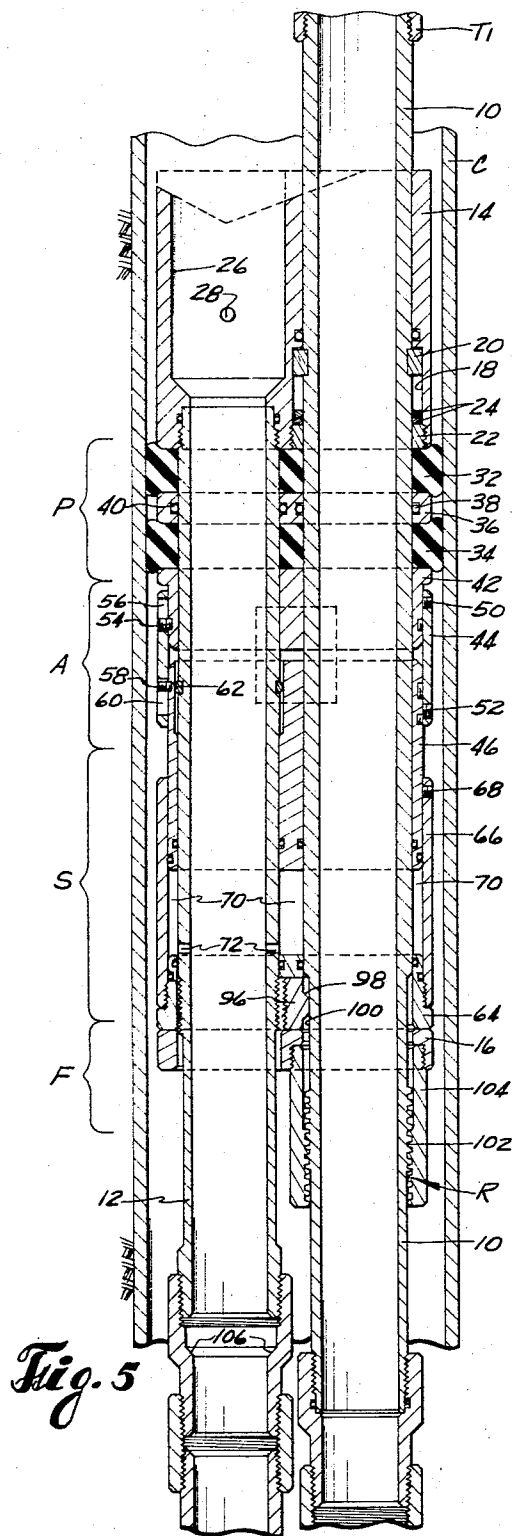
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6 Sheets-Sheet 5



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WELL PACKER

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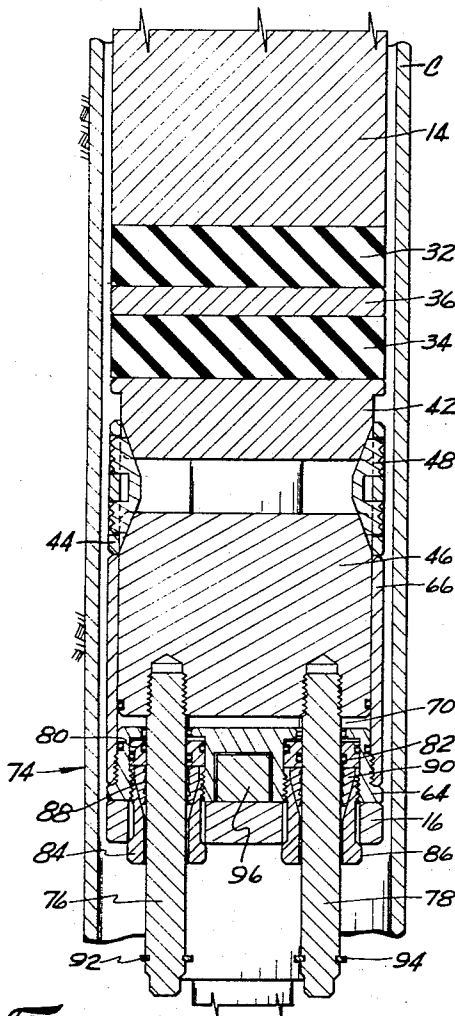


Fig. 7

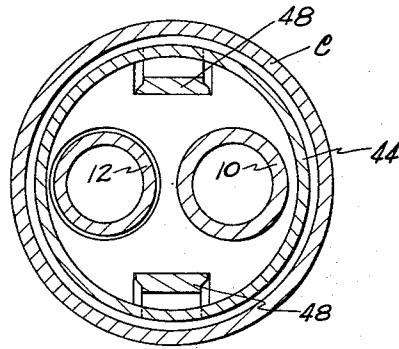


Fig. 8

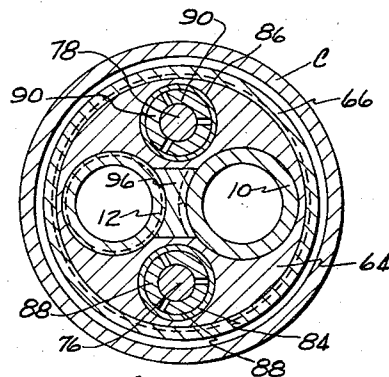


Fig. 9

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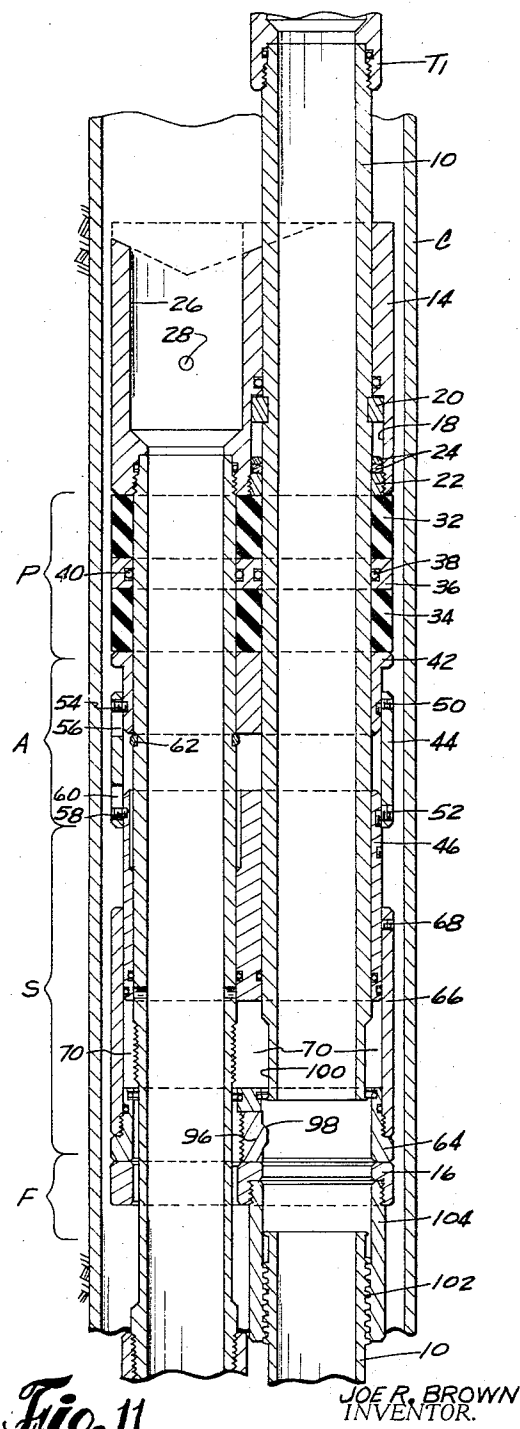
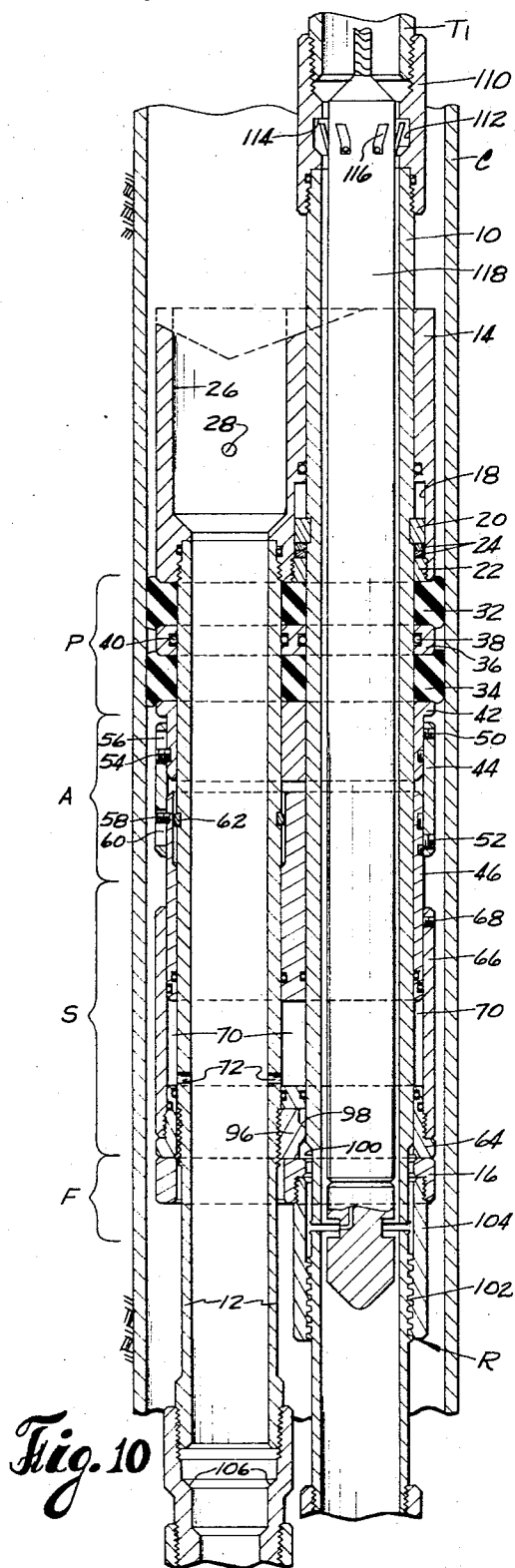
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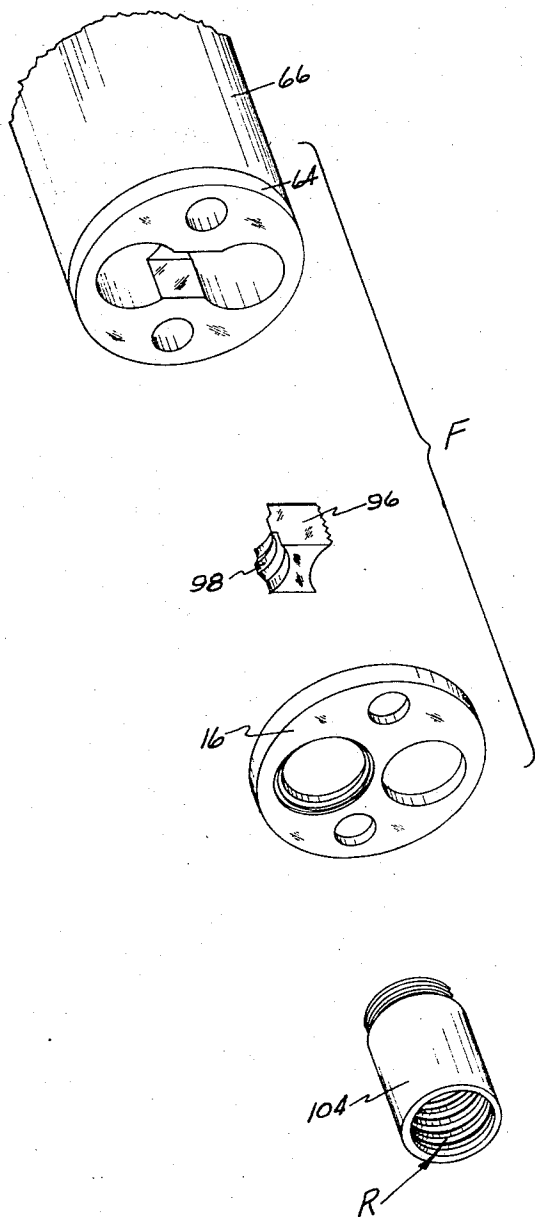


Fig. 12

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3,370,651

WELL PACKER

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9 Claims. (Cl. 166—134)

The present invention relates to new and useful improvements in dual-production well packers and particularly to a hydraulically set, mechanically released dual-production well packer.

The invention is applicable for use in anchoring well device, such as well packers and the like, or well tubing, within the bore of the well.

In certain dual-production well packers the forces exerted upon the assembly have been carried by only one of the tubular supports. This unequal distribution of tension forces to the two tubular supports causes a bowing of the well packer assembly. Such bowing results in a cocking of the sealing assembly. When the packing element of the sealing assembly is cocked or displaced out of axial alignment with the well bore, the packing element fails to hold well pressures.

This cocking of the packing element occurs in dual-production well packers whenever one of the tubular supports is slidable in one of the abutments, usually to allow release of the well packer from set position, and the other tubular support is secured to both abutments. The unequal distribution of tension forces may occur during setting of the well packer assembly or when the pressure loading held by the assembly is not uniformly distributed to the two tubular supports.

Dual-production well packers, which employ a single set of gripping elements for locking the packer against longitudinal movement in both directions, have come into general use for producing well fluids from two producing formations through independent tubing strings. The particular advantage of a packer having the single set of gripping elements locking in both directions is the elimination of radially movable hydraulically actuated hold-down means. Although these packers have been satisfactory under lower pressure conditions, it has been found that under higher pressure conditions the forces increase and tend to place an excessive tension on the single tubing string. Such excessive tension produces the unequal distribution of forces and causes the aforementioned cocking problem. In some instances, the excessive tension may actually bend the tubing string, which is carrying the full load, at a point below the packer assembly.

In mechanically releasable well packers, the release mechanism generally heretofore relied on has included a threaded connection between one of the tubular supports and one of the abutments whereby when the tubular support is rotated, the abutment is moved a sufficient distance to allow the packing and anchoring assembly to be unset. At times where the well packer has remained set for a long period of time in a well bore, actuation of such threaded connections has proven difficult, and in some cases, impossible.

It is, therefore, an important object of the present invention to provide a new and improved well packer assembly having two tubular supports extending through an upper and a lower abutment and, when set, are both held by both of said abutments to at least partially equalize the forces between said tubular supports and thereby eliminate the aforesaid difficulty of cocking of the packing element.

Another object of the present invention is to provide a new and improved hydraulically set, mechanically released dual-production well packer including an alternate method of releasing the well packer from its set position within a well bore.

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A further object is to provide an improved hydraulically set, mechanically released dual-production well packer which, when set, holds against longitudinal movements of the well packer in both directions and utilizes forces developed in the tubular supports of the well packer to increase the setting force holding against longitudinal movement.

Still another object is to provide an improved dual-production well packer having two tubular supports including means to distribute forces to the two tubular supports when said well packer is set and to disengage from said tubular supports for release.

A still further object is to provide an improved dual-production well packer having two tubular supports and upper and lower abutments engaging said tubular supports when said well packer is set and one of said abutments disengaging from said tubular supports for release of said well packer.

The construction designed to carry out the invention will be hereinafter described, together with other features thereof.

The invention will be more readily understood from a reading of the following specification by reference to the accompanying drawings forming a part thereof, wherein an example of the invention is shown, and wherein:

FIGURE 1 is a longitudinal sectional view of a dual-production well packer embodying the principles of the present invention showing the well packer in position within the well bore ready for setting;

FIGURE 2 is a similar view showing the well packer with its packing assembly moved to set position;

FIGURE 3 is another similar view of the well packer illustrating the packing assembly set and the anchoring assembly partially set;

FIGURE 4 is another similar view of the well packer showing the complete set position;

FIGURE 5 is another longitudinal sectional view of the well packer illustrating the initial release of the force distributing means prior to release of the packing and anchoring assemblies;

FIGURE 6 is another longitudinal sectional view illustrating the complete release of the well packer;

FIGURE 7 is a partial longitudinal sectional view of the well packer taken along line 7—7 in FIGURE 1;

FIGURE 8 is a transverse sectional view through the anchoring assembly of the well packer taken along line 8—8 in FIGURE 1;

FIGURE 9 is a transverse sectional view of the force distributing means of the well packer taken along line 9—9 in FIGURE 1;

FIGURE 10 is a longitudinal sectional view of the well packer in set position and including the alternate releasing means having cut the first tubular support for release of the well packer;

FIGURE 11 is another longitudinal sectional view of the well packer in complete released position, which release has been accomplished by the alternate release method; and

FIGURE 12 is a perspective exploded view showing the relationship of the insert to the lower abutment.

Referring more in detail to the drawings, the well packer as illustrated is designed to be run into the well bore defined by the casing C supported on a first tubing string T-1. When the well packer has been lowered to the level at which it is to be set, the second tubing string T-2 is lowered into the well bore and landed in the well packer. The well packer, illustrated in FIGURE 1, is positioned within the casing C at the level for setting with the second tubing string T-2 landed. The other components of the well packer are shown in their running position.

The well packer is provided with a packing assembly P and an anchoring assembly A mounted on the first and

second tubular supports, or mandrels 10 and 12, at a position between the upper abutment 14 and the lower abutment 16. The packing assembly P is of the usual type which will expand radially outward into sealing engagement with the interior of the casing C when it is subjected to longitudinal compression. The anchoring assembly A is provided with suitable gripping elements which are expanded outwardly into gripping engagement with the interior of the casing C to hold the well packer assembly against longitudinal movement in both directions. The setting means S is also mounted surrounding the tubular supports 10 and 12 and is responsive to fluid pressure, normally a hydraulic fluid, to move the packing assembly P and the anchoring assembly A into set position. The force distributing means F is mounted surrounding the tubular supports 10 and 12 immediately below the setting means S and is adapted to provide engagement between the lower ends of the tubular supports 10 and 12 to at least partially equalize the tension forces in such tubular supports. The release means R surrounds the lower end of the tubular support 12 and retains the lower abutment 16 in fixed position until such release means is actuated.

The first tubular support 10 is connected to the first tubing string T-1, extends through the upper abutment 14 and is free to rotate therein moving a limited longitudinal distance with respect thereto. The upper abutment 14 is provided with a bore through which the first tubular support 10 extends and a counterbore 18 in which the snap ring 20, which engages in a groove in the exterior of tubular support 10, is positioned to allow a limited longitudinal movement of the tubular support 10 with respect to the upper abutment 14. To prevent the snap ring from moving out of the lower end of the counterbore 18, the nut 22 is threaded into the counterbore 18. The bearing rings 24 are provided between the upper end of the nut 22 and the snap ring 20 to facilitate the rotation of the tubular support 10 and the snap ring 20 within the upper abutment 14.

The tubular support 12 is threadedly secured into the lower portion of the upper abutment 14 opposite the tubular support 10 and is in communication with the bore 26 into which the second tubing string T-2 is landed. The pins 28 are adapted to be received in the J-slots 30 of the second tubing string T-2 when it is landed in the bore 26 of the upper abutment 14. The second tubing string T-2 is provided with suitable packing to seal against the interior of the bore 26 when it is positioned therein.

The packing assembly P which provides a seal against the well bore surrounds the two tubular supports 10 and 12 immediately below the upper abutment and includes the two resilient sealing elements 32 and 34 and the central sealing follower 36. To seal the packing assembly along the exterior immediately surrounding the two tubular supports 10 and 12, the sealing follower is provided with the O-rings 38 and 40 which seal between the interior of the follower and the exterior surfaces, respectively, of the tubular supports 10 and 12.

To hold the well packer when set against longitudinal movement, the anchoring assembly A is positioned immediately below the packing assembly P and includes an upper expander 42, the cage 44, the lower expander 46 and the gripping elements 48 which have outwardly projecting teeth adapted to, when moved radially outward, engage the interior surface of the casing C in pipe-gripping position. The upper expander 42 abuts the lower surface of the sealing element 34. The anchoring assembly A is set by a longitudinal movement of the expanders 42 and 46 with respect to the gripping slips 48 whereby the tapered surfaces of the expanders wedge the slips radially outward into gripping engagement with the casing C. The cage 44 is releasably secured to the upper expander 42 by the shear pin 50 and also releasably secured to the lower expander 46 by the shear pin 52. Relative rotation of the expanders with respect to the cage 44 and the grip-

ping slips 48 is prevented by the pin 54, which is secured to the upper expander 42 and extends outwardly to the longitudinal slot 56 in the cage 44, and the pin 58, which is secured in the lower expander 46 and extends outwardly into the longitudinal slot 60 in the cage 44. The anchoring assembly A, when in unset position, is supported on the tubular support 12 by the snap ring 62 which is positioned in a groove in the exterior of the tubular support 12 and engages the lower side of the upper expander 42 surrounding the tubular support 12.

The relative movement for setting both the packing assembly P and the anchoring assembly A is accomplished by the exposure of the setting means S to hydraulic fluid pressure, hereinafter more fully explained. The setting means S surrounds the tubular supports 10 and 12 and includes the ring 64 abutting the lower abutment 16 and threadedly secured to the cylinder 66 which surrounds the tubular supports 10 and 12 and the lower projection of the lower expander 46. Thus, the cylinder 66 provides a chamber in which the lower part of lower expander 46 is contained, and by the inclusion of suitable sealing means, the lower expander 46, when exposed to pressure, is urged in an upward direction to accomplish setting of the well packer. The cylinder 66 is releasably secured to the lower expander 46 by the shear pin 68. The shear pins 50, 52 and 68 will, therefore, retain the well packer in unset or running position as it is moved downwardly into the casing C. A pressure chamber 70 is formed within the cylinder 66 and surrounding tubular supports 10 and 12 between the lower edge of the lower expander 46 and the upper surface of the ring 64. Communication is established into this pressure chamber 70 through the tubular support 12 by the ports 72. When actuated by pressure, the setting means S is adapted to cause the lower expander 46 to move upward within the cylinder 66.

In order to prevent having to maintain pressure in the chamber 70 to hold the well packer in set position, a locking means 74 is provided which is best illustrated in FIGURE 7. The locking means includes the two pins 76 and 78 which are threadedly secured into the lower portion of the lower expander 46 and extend downwardly through the ring 64 in the lower abutment 16. The locking ring 64 is recessed to receive the annular pistons 80 and 82 surrounding the pins 76 and 78, respectively, and also the insert bushings 84 and 86, which extend through the lower abutment 16, and are threaded into the lower end of the ring 64. The locking slips 88 and 90 are positioned within the tapered interior recess of the insert bushings 84 and 86 and are engaged at their upper surface by the annular pistons 80 and 82, respectively. Each of the locking slips has upwardly directed teeth to allow the pins 76 and 78 to readily move upward within the slips and to prevent downward movement of the pins 76 and 78 with respect to the ring 64. The lower exteriors of the pins 76 and 78 are provided with the snap rings 92 and 94, respectively.

The force distributing means F includes the releasable engaging means or threaded insert 96 which is adapted to engage the threads on the exterior of the second tubular support 12. Insert 96 is provided with a projection 98 which is adapted to engage the exterior of the tubular support 10. As best seen in FIGURE 1, this insert 96 is held in threaded engagement with the threaded portion of the tubular support 12 by the engagement of the exterior of the tubular support 10 with the projection 98. As seen in FIGURE 1, the first tubular support 10 in normal position is provided with a reduced external diameter or recess 100 on its exterior surface immediately below the point of engagement with the projection 98 on the insert 96. This recess 100 continues downward on the exterior of the tubular support 10 and terminates in the releasing means R or threaded releasable connecting means 102 between the exterior of the tubular support 10 and the sleeve 104. The threads of release means R

connect the sleeve 104 to the tubular support 10. Sleeve 104 is secured to lower abutment 16. Thus, the release means R retains the lower abutment 16 in its fixed position with reference to the upper abutment 14, so long as the release connection R is not actuated.

To effect a build up of suitable pressure within pressure chamber 70 of the setting means, the lower portion of the tubular support 12 is provided with the seat 106 which is adapted to receive a ball or other suitable plug 108 when it is desired to move the well packer assembly to set position.

As stated, the well packer assembly, when lowered to the level within the well bore as defined by the casing C at which it is desired to be set, is supported by the tubing string T-1; and, thereafter, the tubing string T-2 is landed within the bore 26 in upper abutment 14 with the pin 28 engaged in the J-slot 30 of the second tubing string T-2. During running of the well packer, setting is prevented by the shear pins 50, 52 and 68 which are more than sufficiently strong to support the weight of the well packer on the tubing string T-1 as it is lowered into the well bore.

With the well packer assembly positioned at the desired level within the casing C, the ball 108 is dropped through the second tubing string T-2, and, when it lands on the seat 106, closes the lower end of the second tubular support 12 allowing a fluid pressure build-up in the second tubing string T-2. The fluid pressure is then conducted through the ports 72 into the pressure chamber 70. The pressure is exerted downward on the ring 64, which is held against movement by the lower abutment 16 supported by the sleeve 104 and the releasable connecting means 102, and also is exerted upward on the lower expander 46.

The three shear pins 50, 52 and 68 are of varying strength to control the sequence of setting. Shear pin 68 is the weakest of the three shear pins and, therefore, shears first. Shear pin 52 is the strongest of the three shear pins and is the last to shear, as hereinafter more fully explained.

The initial setting action responsive to the pressure developed in the pressure chamber 70 initially shears the shear pin 68. The pressure, thereafter, moves the anchoring assembly upwardly as a unit to set the packing assembly P. This upward movement longitudinally compresses the sealing elements 32 and 34 between the upper abutment 14 and the upper expander 42. Being resilient, the sealing elements 32 and 34 move radially outward into sealing engagement with the interior of the casing C. When the packing assembly P has been completely set, it offers sufficient resistance to the continued upward movement of the anchoring assembly A to prevent further upward movement of upper expander 42. This position is illustrated in FIGURE 2. Thereafter, the shear pin 50, being of intermediate strength with respect to the three shear pins, is sheared, and the cage 44 and lower expander 46 are moved upward with respect to the upper expander 42. This moves the gripping elements 48 upward on the inclined surfaces of the upper expander 42 to cause the gripping elements 48 to move outward into engagement with the interior of the casing C. This position is illustrated in FIGURE 3. When the gripping elements 48 are in tight engagement with the casing C, they resist further upward movement. Thereafter, the pressure developed within the pressure chamber 70 forces the lower expander 46 in an upward direction and shears the shear pin 52. The continued application of pressure forces the lower expander 46 upward under the gripping elements 48 to wedge them firmly into pipe-gripping engagement with the interior of the casing C. This position is illustrated in FIGURE 4.

During the setting operation, the lower expander 46 is moved upward with respect to the lower abutment 16. As it moves upward, its threaded engagement with the pins 76 and 78 draws the pins upward through the insert bushings 84 and 86, the locking slips 88 and 90 and the

pistons 80 and 82. The pressure in the chamber 70 is exerted downward on the pistons 80 and 82 to urge the locking slips 88 and 90 into firm engagement with the inner tapered surface of the insert bushings 84 and 86, and, further, this taper forces the locking slips 88 and 90 into gripping engagement with the pins 76 and 78, respectively, to prevent any return movement of the lower expander 46. In this manner, the well packer assembly, when completely set, is retained in the set position until positively released, as hereinafter more fully explained. The interior of the lower expander 46 immediately surrounding the second tubing support 12 is spaced outward therefrom to allow it to move readily upward over the snap ring 62 without interfering with the setting of the well packer.

In this completely set position, the insert 96 is held in engagement with the second tubular support 12 by tubular support 10 engaging the projection 98. Being confined between the ring 64 and the lower abutment 16, insert 96 functions to transmit forces between the tubular supports and to exert such force to maintain the set position of the well packer. For example, a downward force on the tubular support 12 is exerted through its threaded connection to the insert 96. This force is transmitted by the insert 96 to the lower abutment 16 and through the sleeve 104 and the releasable connecting means 102 to the tubular support 10. Such force acts through the tubular support 10 to urge the upper abutment downwardly to further urge sealing engagement of the packing assembly A and urging the upper expander 42 into tighter engagement with the gripping members 48. This assures that the well packer assembly remains in set position. An upward force on the second tubular support 12 immediately adjacent the point of engagement with the piece 96 is exerted through the piece 96 to the ring 64 and through the locking means 74, including the locking slips 88 and 90 and the pins 76 and 78, to the lower expander 46 to urge lower expander 46 upwardly into firmer engagement with the gripping members 48.

When it is desired to remove the well packer assembly from the well bore, normally the second tubing string T-2 is removed. Release is accomplished by the rotation of the tubing string T-1 which rotates the first tubular support 10 with respect to the sleeve 104 in the lower abutment 16. Initially, this lifts the first tubing string T-1 to position the recess 100 opposite or in registry with the projection 98 on the insert 96. When the tubing string T-1 has been lifted this distance, the insert 96 moves out of engagement with the second tubular support 12 and is positioned as shown in FIGURE 5. Continued rotation of the first tubing string T-1 completes release of the releasing means R. Thereafter, complete release of the well packer is accomplished by lifting of the first tubing string T-1. This causes engagement between the snap ring 20 with the upper end of the counterbore 18 lifting the upper abutment 14. The packing assembly P moves to its normal relaxed position as upper abutment 14 is lifted above the upper expander 42. Continued lifting of the upper abutment 14 raises the tubular supports 10 and 12. When the snap ring 62 engages the lower surface of the upper expander 42, the lifting moves the upper expander upward out from under the gripping members 48. When the upper expander 42 has been completely retracted, the pin 54 engages the upper end of the slot 56 in the cage 44 lifting the cage and, thereby moving the cage and gripping slips 48 upward to allow a complete retraction of the gripping slips 48 out of gripping engagement with the casing C. If desired, the teeth on the lower part of the gripping slips 48 may be of reduced height to assist in release of the anchoring assembly as suggested in the Cicero C. Brown patent application Ser. No. 299,982, filed Aug. 5, 1963. With the well packer assembly completely released, it may be retrieved from the well bore.

Since on completion of the unthreading of the releasable connecting means 102 the lower abutment 16 and

sleeve 104 are not connected to either tubular support, they are supported by the bushings 84 and 86 which can move downward on the pins 76 and 78 only until they come into engagement with and are supported by the snap rings 92 and 94.

When the alternate method of releasing and retrieving the well packer assembly is incorporated into the device, the tubular support 10 is connected by the collar 110 to the first tubing string T-1, as shown best in FIGURE 10. The collar 110 includes a recess 112 around its interior portion providing a shoulder 114 facing downward to receive the flexible clips 116 on a wire line cutting tool 118. With this configuration, the wire line tool 118 may be lowered through the first tubing string T-1, and, when it is determined that it is approximately the desired position, lifted until the clips 116 engage the shoulder 114. Thereafter, cutting operation proceeds as illustrated in FIGURE 10. The engagement of the clips 116 against the shoulder 114 positions the cutting of the tubular support 10 at a position immediately above the threaded connection 102 and in the area of reduced external diameter 100.

This reduced diameter portion 100 of the tubular support 10 provides a minimum thickness of wall through which to cut and also allows a space beyond the exterior of the tubular support to prevent damage to any of the remainder of the well packer by the cutting. This alternate method contemplates the use of any wire line tubing cutter which will cut through the reduced portion of tubular support 10 without cutting the remainder of the well packer. A standard wire line tubing cutter may be used since the wall of the tubular support 10 in the reduced portion 100 is normally no thicker than a standard tubing wall.

To accomplish this alternate method of release with the wire line cutting tool 118 positioned as hereinbefore described, the tubular support 10 is cut immediately above the threaded connection 102 through the reduced diameter portion 100. Release is then accomplished by lifting of the first tubing string T-1 upwardly so that the snap ring 20 engages the upper end of the counterbore 18 to lift the upper abutment 14 and allow the packing assembly P to return to relaxed position. This also allows the insert 96 to release from tubular support 12. Thereafter, continued lifting of the upper abutment 14 lifts the tubular support 12 to cause the snap ring 62 to engage the underside of the upper expander 42 retracting the expander 42 from under the gripping elements 48. Further lifting positions the pin 54 in the upper end of the vertical slot 56 in the cage to lift the cage 44 upward and to move the gripping members 48 upward off the lower expander 46 thereby retracting the gripping members from gripping engagement with the casing C. This completes the unsetting of the anchoring assembly A and the well packer assembly may be retrieved by lifting the tubing string T-1.

Normally, it will be a general practice to remove the wire line cutting tool 118 before unsetting of the well packer assembly. This is possible by retaining the weight on the tubing string T-1 while the wire line cutting tool is lifted. The clips 116 are designed to have sufficient weakness so that when it is desired to remove the cutting tool 118, lifting of the wire line shears the clips 116 and the cutting tool may be retrieved from the tubing string T-1. When it is completely removed, the release of the well packer is accomplished by lifting of the tubing string T-1 and may then be removed from the casing C.

From the foregoing it can be seen that the new and improved dual-production well packer utilizes forces developed in the tubular supports to maintain its set position and at least partially equalizes the tension forces between the tubular supports. This is accomplished by the insert which coacts with the lower abutment and is held in engagement with the second tubular support by the first tubular support. The reduced diameter portion of

the first tubular support on release allows release of the insert from the second tubular support. Also, this reduced diameter portion provides a position for the cutting of the first tubular support to provide for the positive release of the well packer in the event the normal release means becomes inoperative.

The foregoing disclosure and description of the invention are illustrative and explanatory thereof, and various changes in the size, shape and materials, as well as in the details of the illustrated construction, may be made within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. A dual-production well packer adapted to be lowered and set within a well bore, comprising
 - a first tubular support,
 - a second tubular support,
 - an upper abutment surrounding said tubular supports and secured to said second tubular support,
 - means connecting said first tubular support to said upper abutment whereby said first tubular support may be rotated within said upper abutment and to provide a limited longitudinal movement of said first tubular support with respect to said upper abutment,
 - a lower abutment surrounding said tubular supports and spaced longitudinally thereon below said upper abutment,
 - an anchoring assembly, including gripping elements, mounted on said tubular supports between said abutments,
 - setting means mounted on said tubular supports and coacting with said anchoring assembly to move said assembly into set position when actuated,
 - the setting of said anchoring assembly moving said gripping elements of said anchoring assembly into pipe-gripping position with said well bore to hold against longitudinal movement in both directions,
 - means releasably connecting said first tubular support to said lower abutment, and
 - means coacting with said lower abutment and releasably engaging said second tubular support to hold said second tubular support against longitudinal movement with respect to said lower abutment,
 - said releasable engaging means coacting with said lower abutment and said releasable connecting means to at least partially equalize tension forces in said first and second tubular supports.
2. A dual-production well packer according to claim 1, wherein
 - said first tubular support maintains said engaging means in engagement with said second tubular support.
3. A dual-production well packer according to claim 2, wherein
 - release of said releasable connecting means providing a limited longitudinal movement of said first tubular support with respect to said upper abutment and said lower abutment,
 - such longitudinal movement of said first tubular support releasing said engaging means from said second tubular support whereby said upper abutment is free to be lifted with said tubular supports to release the well packer from set position.
4. A dual-production well packer according to claim 3, wherein said engaging means includes
 - an insert adapted to releasably engage said second tubular support and wherein
 - a portion of said first tubular support coacts with said insert to maintain said insert in engagement with said second tubular support,
 - said first tubular support includes a reduced external diameter portion positioned adjacent said portion of said first tubular support maintaining said insert in engagement with said second tubular support,
 - limited longitudinal movement of said first tubular support moving said reduced diameter portion of said

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first tubular support opposite said insert and providing space for said insert to move out of engagement with said second tubular support.

5. A dual-production well packer according to claim 1, including

a packing assembly mounted on said tubular supports between said abutments and adapted to be moved into sealing engagement with the well bore by said setting means.

6. A dual-production well packer according to claim 1, including

means in said second tubular support to engage said anchoring assembly and release said gripping elements from pipe-gripping position after release of said engaging means and responsive to lifting of said second tubular support.

7. A dual-production well packer according to claim 1, wherein

said connecting means between said first tubular support and said upper abutment provides for rotation of said first tubular support within said upper abutment, and

rotation of said first tubular support releases said connecting means between said first tubular support and said lower abutment.

8. A dual-production well packer according to claim 1, wherein

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the external diameter of said first tubular support is reduced immediately above said releasable connecting means and is thereby adaptable for cutting to release said anchoring assembly from set position.

9. A dual-production well packer according to claim 8, including

a collar connecting said first tubular support to a first tubing string, and

an internal recess in said collar positioned to locate a cutter within said first tubular support to cut through the reduced diameter portion of said first tubular support above said releasable connecting means whereby lifting of the upper end of said first tubular support release said engaging means and releases said anchoring assembly from pipe-gripping position.

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