

July 11, 1967

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3,330,360

MULTIPLE ZONE PRODUCING APPARATUS

Filed Aug. 10, 1964

2 Sheets-Sheet 1

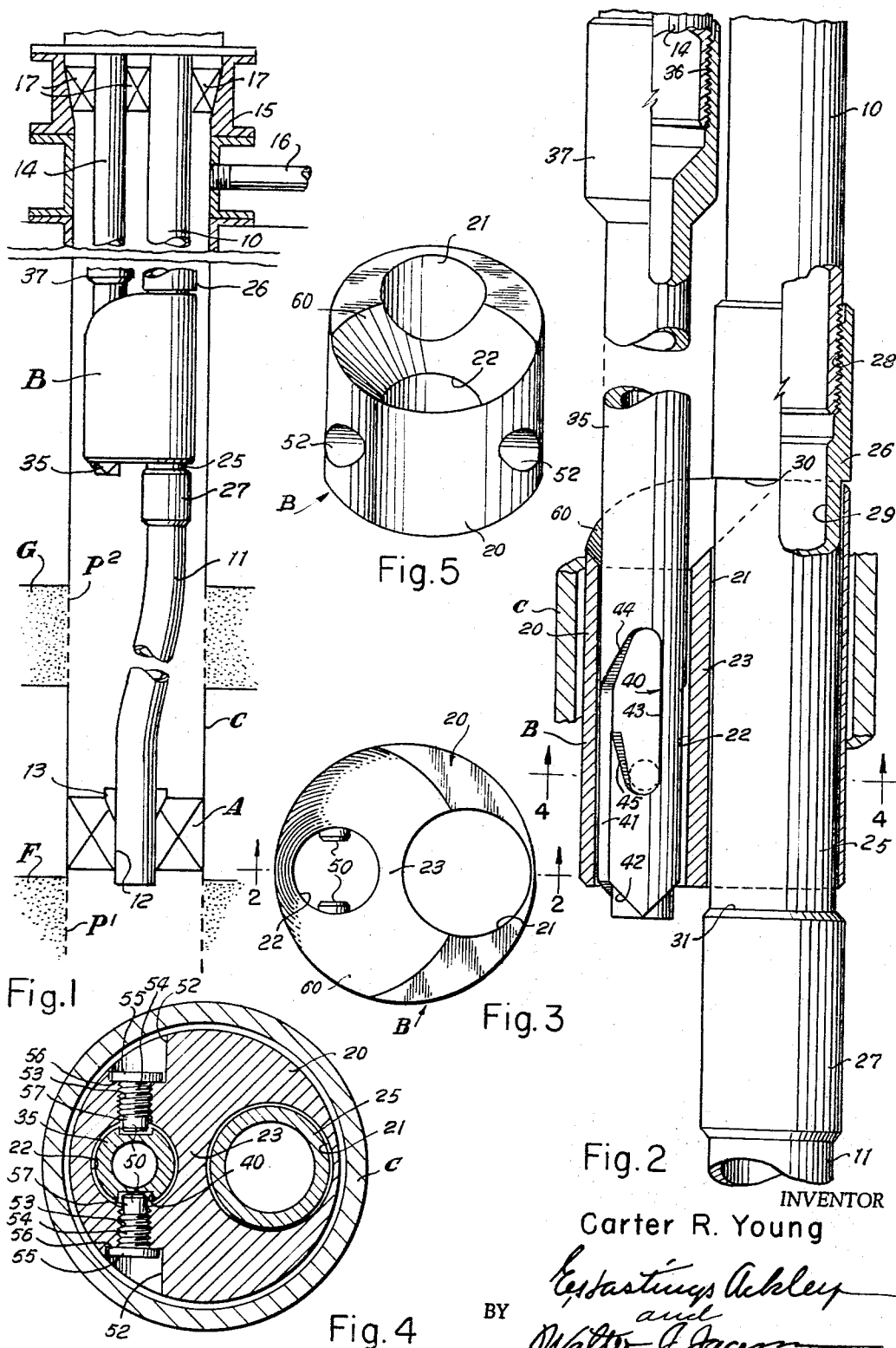


Fig. 2

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2 Sheets-Sheet 2

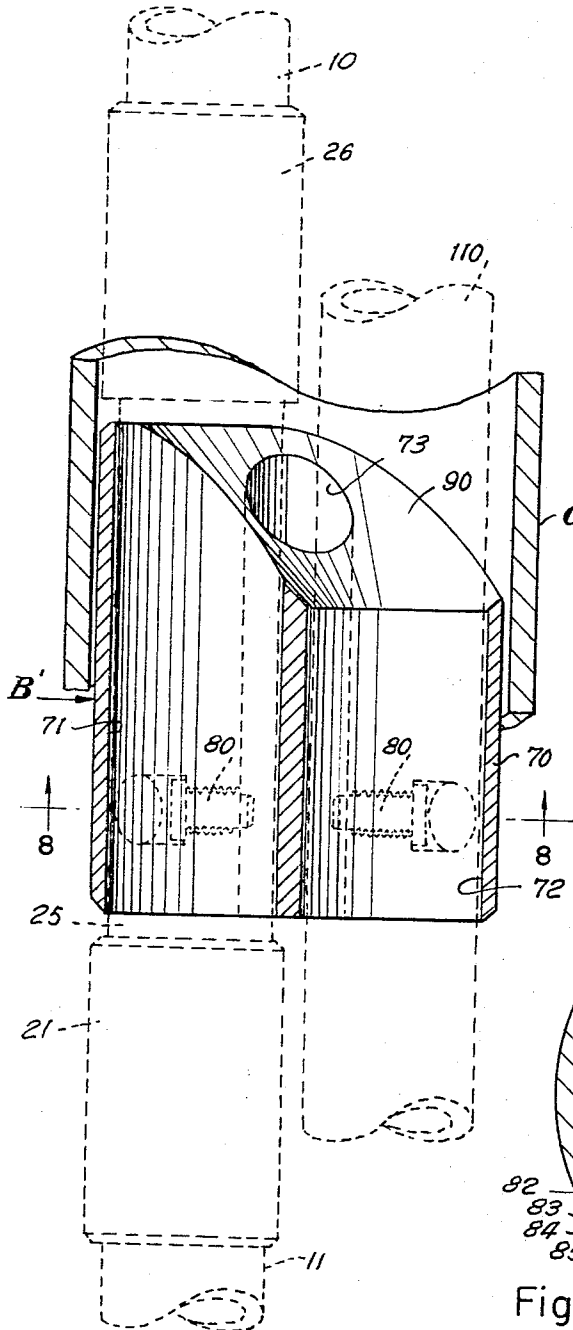


Fig. 6

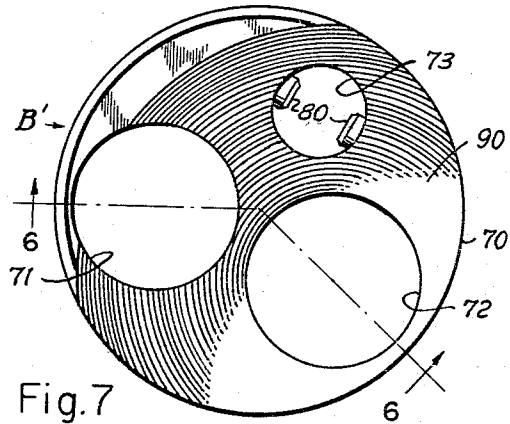


Fig. 7

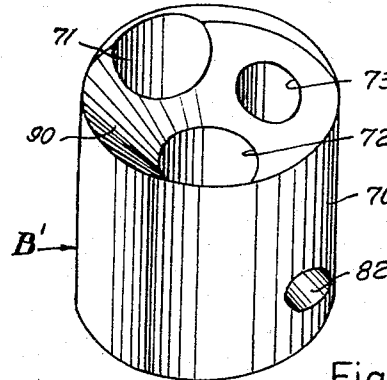


Fig. 9

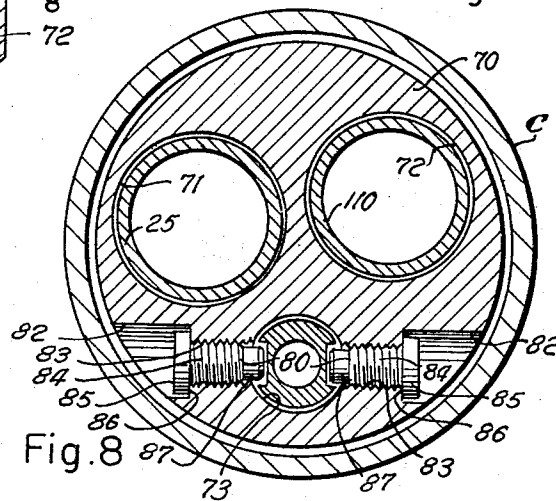


Fig. 8

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MULTIPLE ZONE PRODUCING APPARATUS
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11 Claims. (Cl. 166—179)

This invention relates to new and useful improvements in well tools, and more particularly to a well apparatus and system for running a plurality of tubing strings in a well bore or pipe for producing from a plurality of zones.

One object of the invention is to provide a well apparatus and system by means of which production from a plurality of producing zones in a well bore may be produced through a plurality of separate strings disposed in the well bore and utilizing a minimum number of packers in the well bore for separating the zones from each other.

An important object of the invention is to provide a multiple zone producing apparatus which is adapted to be run into a well bore on a tubing string and appropriately related to a packer or packers in the bore of the well set between producing zones in the well in order that production from the zones below each of the packers will flow through a separate tubing string and the production from the upper zone above the packers will flow through a short tubing string run into the well bore along side the other strings and related to the apparatus in such a manner as to permit production from the upper zone through the latter tubing string to the top of the well.

A particular object of the invention is to provide a new and improved apparatus for running a plurality of tubing strings in a well packer wherein a well packer is first set in the well pipe for receiving therethrough the lower end of a first tubing string having a support or anchor member thereon and thereafter a second tubing string is connected with said anchor above the packer to receive production from the zone above the packer and conduct the same to the well surface.

A further object of the invention is to provide an anchor of the character set forth in which the anchor is adapted to be secured to a first tubular string to which an upper packer is connected, which upper packer is provided with at least two longitudinal passages therethrough and through one of which said first string extends downwardly below the packer and is adapted to be set in a second packer disposed between two lower producing zones, said upper packer being set in the well bore between an upper zone and an intermediate zone therebelow, said head having means for passing a second tubing string therethrough to the second well bore of the first packer for connection therewith for producing fluids from the zone between the first packer and the second packer, said head also having a third passage therein for receiving and anchoring the lower end of a third producing tubing string at said anchor for producing fluids from the zone above the upper packer to the top of the well bore.

A particular object of the invention is to provide a well apparatus or anchor of the character set forth which has means for rotatably mounting it on a first tubing string whereby the tubing string may be rotated with respect to said anchor or moved a limited distance longitudinally with respect to said anchor to manipulate other well tools such as setting packers therebelow by means of rotative and/or longitudinal movement, said anchor permitting such rotative movement of the first tubing string with respect to the anchor.

A further object is to provide a well tool of the character set forth in which the anchor is adapted to be secured to a first tubing string at a fixed location and to permit said tubing to rotate with respect thereto, said anchor having a guide surface for guiding another tubing

string to another longitudinal passage therethrough and means in said passage for connecting said other tubing string to said anchor to hold the lower end of said other tubing string at such position in the well bore.

Additional objects and advantages of the invention will be readily apparent from the reading of the following description of a device constructed in accordance with the invention, and reference to the accompanying drawings thereof, wherein:

FIGURE 1 is a schematic view diagrammatically illustrating a well having an apparatus of the character of the invention disposed therein;

FIGURE 2 is an enlarged view, partly in elevation and partly in section, of the anchoring device showing the same in position on a well tubing and showing a second tubing connected thereto;

FIGURE 3 is a top plan view of the upper end of the anchor of FIGURE 2 with the tubing removed therefrom;

FIGURE 4 is a horizontal cross-sectional view taken on line 4—4 of FIGURE 2;

FIGURE 5 is an isometric view of the anchor of FIGURE 2;

FIGURE 6 is a vertical sectional view of a modified form of the anchor of the invention showing tubing strings extending therethrough in dotted lines;

FIGURE 7 is a top plan view of the anchor of FIGURE 6;

FIGURE 8 is a horizontal cross-sectional view taken on line 8—8 of FIGURE 6; and

FIGURE 9 is an isometric view of the anchor of FIGURE 6.

In the drawings, the letter A designates generally a well packer of any well known construction, such as the Otis Type WA or Type TB packers illustrated in the 1964-65 Composite Catalog or Oil Field and Pipe Line Equipment, page 3638. The packer is adapted to be set in a well casing C by lowering the same into such casing in any suitable means such as a wire line or tubing string. The packer is shown to be set above a lower well formation F and below an upper well formation G. The usual perforations P1 and P2 are provided in the wall of the well casing C to establish communication between the formations and the interior of the casing. With the packer A set in the casing, a first tubing string 10 having an elongate lower tubing extension 11 is lowered into the casing C and is positioned with its lower end extending through the opening 12 in the packer A so as to establish fluid communication between the lower open end of the first tubing string and the lower wall formation F below the packer. The first tubing string 10 has a tubing string support assembly or anchor B carried thereby with the extension 11 therebelow and which is lowered into the well with the tubing string and is positioned at a point above the packer A. The lower tubing extension 11 has a stop member and seal sleeve 13 connected thereto by welding or threads or other suitable means so as to limit downward movement of the tubing extension 11 through the packer and to provide a seal between the tubing extension and the packer. Engagement of the stop member 13 with the packer supports the tubing above the packer and thereby positions the tubing support assembly device or anchor B in the well bore or casing. After the first tubing string has been thus located in the well bore or the casing, a second tubing string 14 is lowered into the casing and is connected to the support assembly B in a manner which will be more fully hereinafter described, the lower end of the second tubing string being open and in fluid communication with the upper well formation G above the packer A. Thus, the two tubing strings 10 and 14

are positioned in the casing in the well bore for separately communicating with the formations F and G and are supported against longitudinal downward movement in the casing. The upper ends of the tubing strings are secured to the usual well head or tubing hanger 15, having a lateral flow outlet 16 and a plurality of supporting and sealing members 17 surrounding the tubing strings and supporting the same in the well head or hanger 15 in the usual manner. The usual well flow connections and flow lines (not shown) are connected to the upper ends of the tubing strings 10 and 14.

The details of construction of the tubing string support assembly or anchor B, and the manner of connection thereof with the tubing string 10, the tubing extension 11 and the other tubing string 14 are illustrated in FIGURES 2 through 5. As shown therein, the anchor assembly B includes a cylindrical body 20 which has a pair of longitudinally extending bores or passages 21 and 22 extending therethrough which are spaced laterally from each other so as to leave an intermediate wall or web portion 23 between the passages.

The larger first bore or passage 21 in the body 20 is offset from the axis of the body and extends to a short distance from the outer periphery of the cylindrical body 20. The second and smaller bore or passage 22 is likewise offset from the axis of the body and also terminates short of the exterior surface of the body.

A tubular mandrel or nipple 25 having an enlarged head or box upper end 26 extends downwardly through the bore of the first passage 21 and is slidably longitudinally and rotatably in said passage. The lower end of the nipple or mandrel 25 is provided with external screw threads, which are adapted to be threaded into the upper end of a coupling 27 threaded on the upper end of the lower tubing extension 11. Thus, the upper end of the lower tubing extension 11 is connected by means of the coupling 27 with the nipple or mandrel 25. The enlarged head 26 of the nipple is provided with internal screw threads or a threaded box 28 which is adapted to receive the threaded lower end of the first tubing string 10 therein, as clearly shown in FIGURE 2. Thus, the bore of the tubing string 10, the bore 29 of the nipple 25 and the bore of the tubing extension 11 are in communication with each other and provide a path for flow of fluid from the lower end of the tubing extension 11 to the nipple and upwardly through the nipple to the tubing 10 thereabove and thence through the tubing to the surface of the well.

The distance between the shoulder 30 at the lower end of the head 26 of the nipple 25 and the upper end 31 of the coupling 27 is slightly greater than the overall length of the cylindrical body 20 of the support or anchor member B, whereby the anchor member is movable through a limited distance longitudinally on the mandrel or nipple 25 and, since the external diameter of the nipple 25 is slightly less than that of the first bore 21 of the body 20, the nipple or mandrel may be rotated about its longitudinal axis in such first bore or passage 21.

The second tubing string 14 is provided with a bottom adapter or J-latch mandrel 35 which is threadedly connected by means of internal threads 36 in the bore of the enlarged head or box 37 of the latch mandrel with the lower end of the second tubing string 14, as clearly shown in FIGURE 2. The diameter of the mandrel 35 is such that it will readily enter the smaller second bore 22 of the body 20 and be movable longitudinally and rotatably in such bore or passageway. A pair of diametrically opposed J-slot connecting slots 40 are formed on diametrically opposed sides of the lower portion of the J-latch mandrel 35 and the elongate vertical portions 41 of the J-slots extend upwardly from divergent mouth portions 42 at the lower end of the mandrel to a laterally offset vertical latching portion 43 which is connected with the upper end of the elongate vertical slot portion 41 by an

upwardly and counter-clockwise inclined surface 44 at the upper end of the vertical section 41 extending upwardly to the upper end of the vertical offset portion 43 of the J-slot. A downwardly and counter-clockwise inclined lower surface 45 extends from the upper portion of the elongate vertical section 41 of the J-slots downwardly to the lower portion of the offset vertical portion 43 of the J-slots and is adapted to engage one of a pair of latching pins 50 which projects radially into the passage 22 for connecting the J-latch mandrel with the body 20. Each of the latching pins 20 is disposed in one of a pair of diametrically opposed bores 52 formed in the wall of the body 20 and extending into the bore of the passage 22 on diametrically opposite sides thereof as best shown in FIGURES 3 and 4. The inner portion of each of the bores 52 is reduced and is provided with internal screw threads 53 which receive the threaded shanks 54 of latching pins 50 which projects radially into the passages engage the shoulders 56 in the opening 52 at the outer ends of the reduced threaded portions 53 thereof. The length of the latching pin is such that the distance between the head 55 of the pin and the point 57 thereof is such that the point projects a sufficient distance into the bore of the smaller passage 22 in the body 20 to engage in the J-slot in the J-latch mandrel 35 as clearly shown in FIGURE 4. Since there are two diametrically opposed latch pins 50 provided in the anchor which engage in diametrically opposed J-slots 40 in the J-latch mandrel 35, it will be seen that the J-latch mandrel is securely connected with the body 20 when the mandrel is disposed in the passage 22 and the latch pins are engaged in the lower portions of the offset vertical sections 43 of the J-slots 40, as shown in FIGURE 2. A downwardly and inwardly inclined or frusto-conical tapered guide surface 60 is formed in the upper surface of the body 20 in substantial axial alignment with the axis of the smallest passage 22, and this downwardly and inwardly inclined surface 60 is designed to guide the lower end of the J-latch mandrel 35 readily into the passage or bore 22 in the body.

In the operation or use of the device shown in FIGURES 1 through 5, the well packer A is initially set in the well pipe or casing C between the formations F and G; and, as previously explained, after the packer has been thus set the support or anchor assembly B is lowered into the casing on the tubing string 10. The tubing extension 11 connected to the lower end of the nipple or mandrel 25 extends below the support assembly B and the lowering of the tubing with the extension so connected below the support assembly is continued until the stop and seal member 13 at the lower end of the extension contacts the packer A. At such time the lower portion of the tubing extension extends through the bore 12 of the packing A and the extension is lowered until the stop of the seal and stop section 13 engages the packer whereby the lower portion of the tubing extension has communication with the area of the bore of the wall below the packer A and the formation F below such packer. The stop and seal member 13 being engaged with the packer A, the tubing string 10 is supported above the packer and the support assembly B is likewise supported by the tubing extension 11 at a predetermined distance above the packer.

Since the body 20 is rotatably and longitudinally slidably mounted on the mandrel 25, it will be seen that the tubing string 10 and the tubing extension 11 connected with the mandrel may be rotated about their axes, if necessary, to engage the stop and seal member 13 at the lower end of the tubing extension within the bore of the packer A, or if necessary, to engage a J-latch connection on the stop and seal member 13 with corresponding cooperating members in the bore of the packer. Such rotation of the tubing string and the mandrel 25 in the offset bore 21 of the body 20 does not cause rotation

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of the body, since the body will be prevented from rotating by its engagement with the wall of the casing C, and the body will remain stationary and will not rotate about its axis but will permit the tubing string 10 and the tubing extension 11 and the mandrel 25 to rotate with respect to the body.

After the first or primary tubing string 10 has been lowered into the well and the seal stop member 13 at the lower end of the tubing extension engaged with the packer, the second or shorter tubing string 14 having the J-latch mandrel 35 threadably connected to its lower end is lowered into the casing C until the lower end of the latch mandrel engages the frusto-conical or tapered guide surface 60 at the upper end of the body 20 and is guided thereby into the second smaller bore or passage 22 in the body. Obviously, the second tubing string 14 may be rotated as desired to facilitate entry of the lower end of the mandrel into the passage 22 and to facilitate alignment and engagement of the J-slots 40 with the latch pins 50 of the body 20. When the J-slots have been engaged with the pins so that the J-latch mandrel 35 is releasably connected with the body 20, an upward tension strain may be taken on the tubing string 14 if desired. Obviously, this tension applied to the tubing string 14 will not lift the body 20 since upward movement of the body is limited by the engagement of the upper end of the body with the downwardly facing shoulder 30 at the lower end of the head or box 26 on the nipple or mandrel 25. Also, downward movement of the body 20 is limited by the engagement of the lower end of the body with the upwardly facing shoulder 31 at the upper end of the collar 27 secured to the lower end of the mandrel 25.

Should it be necessary or desirable at any time after the tubing strings have been installed in the well bore and connected as has just been explained, it is readily apparent that the primary or elongate tubing string 10 may be rotated about its axis in the passage 21 of the body 20 to accomplish any desired result attainable by such rotation. It is also readily apparent that the rotation of the long string tubing string 10 will not affect the connection of the short tubing string 14 with the support or anchor member B. It is further apparent that the connection of the short tubing string 14 with the support or anchor member B may be disengaged and the short tubing string may be lifted without disturbing in any manner the long tubing string 10 or the body 20.

With the short tubing string connected to the body 20 of the anchor member B, the flow passage of the J-latch mandrel 35 is placed in communication with the upper formation G in the well bore and fluids from such upper formation above the packer A may flow upwardly through the bore of the J-latch mandrel and through the bore of the tubing string 14 thereabove and thence to the surface of the well through the usual flow line connections at the upper end of the tubing string.

In order to remove the assembly from within the well bore, the short tubing string 14 is rotated to disengage the J-slots 40 from connection with the pins 50 in the body 20 and the short tubing string is then lifted out of the well bore. The long tubing string 10 may be then rotated or otherwise suitably manipulated to release it from connection with the packer A and the long tubing string may then be lifted from the well bore carrying the body 20 of the support or anchor member B upwardly and out of the well therewith. The rotation of the long tubing string 10 does not effect rotation of the body 20 of the support member.

It is believed readily apparent that the J-latch mandrel J-slot 40 may be so formed in the mandrel that the offset vertical portion 43 of the slot is disposed in either a clockwise direction or the counter-clockwise direction shown in FIGURE 2 from the elongate vertical section 41 of the J-slot, as desired. Of course, if desired, the J-slot may be omitted, or other latching means may be provided for

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securing the mandrel 35 in the small bore 22 of the body 20 of the support member.

A modified form of support or anchor member B is shown in FIGURES 6 through 9 and includes a body 70 which is provided with three longitudinally extending passages 71, 72 and 73. The passages 71 and 72 are similar to the passage 21 of the anchor member first described, the passage 72 being smaller in diameter than the diameter of the passage 71, if desired, and the diameter of the third passage 73 being smaller than the diameter of the passage 72. It is not necessary, however, that the diameter of the passage 72 be smaller than that of the passage 71, since the mandrel 25, shown in dotted lines in FIGURE 6, is disposed in the passage 71 and the passage 72 is open and may be of any size larger than the diameter of the third passage 73. The passage 71 is offset from the central longitudinal axis of the body 70 as clearly shown in FIGURE 7 and the passage 72 is likewise offset from the axis of the body as is the third passage 73, and an intermediate or central web portion 74 is left therebetween.

The third passage 73 has a pair of J-latch pins 80 disposed in diametrically opposed bores 82 formed in the wall of the body 70 and extending into the bore of the passage 73 on diametrically opposite sides thereof as best shown in FIGURES 7 and 8. The inner portion of each of the bores 82 is reduced and is provided with internal screw threads 83 which receive the threaded shanks 84 of the latching pins 80. The heads 85 of the latching pins engage the shoulders 86 in the opening 82 at the outer ends of the reduced threaded portions 83 thereof. The length of the latching pin is such that the distance between the head 85 of the pin and the point 87 thereof is such that the point projects a sufficient distance into the bore of the smaller passage 73 in the body 70 to engage in the J-slot in the J-latch mandrel 35 as clearly shown in FIGURE 8. Since there are two diametrically opposed latch pins 80 provided in the anchor bore 73 which engage in diametrically opposed J-slots 40 in the J-latch mandrel 35, it will be seen that the J-latch mandrel is securely connected with the body 70 when the mandrel is disposed in the passage 73 and the latch pins are engaged in the lower portions of the offset vertical sections 43 of the J-slots 40.

The upper end of the body is provided with a substantially frusto-conical downwardly and inwardly tapered or inclined guide surface 90, the axis of which substantially coincides with the axis of the second passage 72 through the body, and this guide surface 90 is adapted to guide a second tubing string into the passage 72. The third passage 73 is disposed to one side of the passage 72 and also extends through the guide surface 90, and, if desired, a second frusto-conical guide surface (not shown) similar to that disclosed in the United States Letters Patent to H. K. Todee, No. 2,976,934, may be formed in the upper end of the body 70 to guide the third tubing string into the third passage.

In use, the primary or long tubing string 10 is connected at its lower end with the threads 28 in the head 26 of the mandrel or nipple 25 which extends through the first passage of the bore 71 of the body 70 and the mandrel is connected at its lower end by means of the threads at the lower end thereof with the coupling 27 at the upper end of the long string tubing extension 11. The long string extension 11 may be of such length that it will pass through a packer having two bores there-through disposed between the upper and an intermediate producing zone (not shown) in the bore of the well and downwardly therethrough to a lower packer disposed between the intermediate zone and a lower zone (not shown). A suitable seal nipple (not shown) may be provided in the extension tubing 11 below the anchor 70 for sealing between the extension tubing and the bore of the upper packer. Thus, when the extension is engaged with the lower packer, the tubing extension 11 and the long tubing string 10 is in flow communication with the

zone below the lower packer. After the stop and sealing member 13 of the extension has been engaged within the bore of the lower packer in a manner similar to that of the form first described, a second or intermediate string of tubing may be lowered from the surface of the well downwardly in the casing C to engage the inclined guide surface 90 at the upper end of the body 70, and the lower end thereof will be guided by such surface to the second flow passageway 72 extending through the head or body of the anchor 70, as shown in FIGURE 6 in dotted lines. The intermediate string may then be lowered through the passage 72 to engage the upper packer (not shown) to establish communication between said intermediate tubing string and the intermediate producing zone in the well. After the intermediate string has been lowered through the support member or anchor B, the third tubing string 14 having the J-latch mandrel 35 at its lower end may be lowered into the well bore between the wall of the casing and the other two tubing strings until the lower end of the mandrel engages the inclined guide surface 90 at the upper end of the body 70 and may be then rotated or manipulated sufficiently in such a manner as to guide the lower end of the J-latch mandrel into the third opening or passage 73 in the support member or anchor, whereupon the J-slots may be engaged with the latching pins 80 projecting into such third passage.

It will thus be seen that three tubing strings may be extended through the anchor or support member B and that both the long or primary tubing string and the intermediate tubing string may be rotated with respect to the body 70 of the support member or anchor B without disturbing the same. Also, it will be seen that the intermediate string may be moved longitudinally through the passage 72 as desired without disturbing or moving the anchor B. The third string may also be engaged or disengaged with and rotated with respect to the body 70 of the anchor in the same manner as has already been described with respect to the form shown in FIGURES 1 through 4 without disturbing the body.

The tubing strings may be disconnected in reverse order, the third tubing string being disconnected from the passage 73, then the intermediate string being moved upwardly through the passage 72, both without moving or affecting the body 70 of the support member anchor B. Thereafter, the tubing string 10 may be rotated or otherwise manipulated to disengage the same from the packers therebelow to lift the support member or anchor B therewith out of the bore of the well casing C.

It is believed readily apparent that additional bores or passages may be provided through the body of the anchor or support member if desired and that the diameter of the bores or passages through the body may be varied and disposed with respect to a guide surface on the upper end of the body to accommodate as many as four or five strings of tubing, if desired. It will be seen that the tubing string anchor body member is freely rotatable with respect to the tubing having the mandrel 25 connected thereto, and permits the tubing to be manipulated if desired to facilitate running of the tubing and the anchor or support member B into the well casing and engagement of the long tubing string with the packer or other well tool therebelow. It will also be seen that other tubing strings may be run through passages, such as secondary or tertiary passages, in the body of the anchor or support member and that a short string such as the tubing string 14 may be connected to the anchor and placed under tension without disturbing the anchor or moving the same from its position on the long string.

The foregoing description of the invention is explanatory only, and changes in the details of the construction illustrated may be made by those skilled in the art, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. In combination with a well packer disposed within a well bore in a set position to separate two producing zones wherein said packer has a passage extending therethrough, a tubing string support assembly including: a body having a pair of passages extending therethrough; a first tubing string extending entirely through one of the passages of the body and movably connected to the body, the lower portion of said first tubing string projecting downwardly from the body and having its lower end extending through the passage in the well packer to communicate with the producing zone below said packer; means on the lower portion of said first tubing string engaging the well packer to support the body within the well bore; and a second tubing string having its lower portion landed in the second passage in the body and having its lower end terminating above the well packer to communicate with the zone above said packer; said first tubing string being movable with respect to said body while said second tubing string is engaged in said second passage of said body, whereby the lower portion of said first tubing string may be moved without moving the body and without moving the second tubing string.

2. The combination as set forth in claim 1 together with means for detachably connecting said second tubing string in landed position in said second passage of said body, whereby said second tubing string may be run into the well bore independently of said first tubing string.

3. A well apparatus for use within a well bore including: a well packer having a passage therethrough and disposed within a well bore in a set position to separate upper and lower producing zones; a tubing string support assembly including a body having a pair of passages extending longitudinally therethrough; a first tubing string extending entirely through one of the passages in the body and rotatably secured to said body, the lower portion of said first tubing string projecting downwardly through the passage of the well packer and having its lower end communicating with the lower producing zone below said packer; a second tubing string lowerable into the well bore after the first tubing string and support are located therein, said second tubing string being landed within the second passage of the support body and having its lower end terminating above the well packer and communicating with the upper producing zone above the packer; said first tubing string being rotatable about its longitudinal axis with respect to said body while said second tubing string is engaged in said second passage of said body, whereby the lower portion of said first tubing string may be rotated without rotating the body and without rotating the second tubing string, said first and second tubing strings providing mutually exclusive flow conduits through said body.

4. The well apparatus of claim 3, and means for detachably connecting said second tubing string in landed position in said second passage of said body.

5. The combination as set forth in claim 4 wherein said first tubing string is also longitudinally movable with respect to said body.

6. In combination with a well packer disposed within a well bore in a set position to separate two producing zones wherein said packer has a passage extending therethrough, a tubing string support assembly including: a body having a pair of passages extending therethrough; a first tubing string extending entirely through one of the passages of the body and connected to the body, the lower portion of said first tubing string projecting downwardly from the body and having its lower end extending through the passage in the well packer to communicate with the producing zone below said packer; said first tubing string being rotatable with respect to said body and providing a continuous flow passage from the zone below the packer to a point above the body exclusive of flow communication with the other passage of said body.

7. The combination as set forth in claim 6 together with means for detachable connecting said second tubing string in landed position in said second passage of said body, whereby said second tubing string may be run into the well bore independently of said first tubing string.

8. An anchor for use in a multiple zone well including: a body member having a diameter less than the diameter of the bore of the well and having a plurality of longitudinally extending passageways formed therein; means in a first passageway of said body member for connecting said body member to a first tubing string, said means limiting longitudinal movement of said body member with respect to said first tubing string but permitting rotative movement of the tubing string with respect to said body member, said means providing a first flow conduit through said body exclusive of flow communication with the other passages of said body; and guide means on the upper end of the surface for guiding a second tubing string to a second passageway of said body member.

9. A device of the character set forth in claim 8 wherein means are provided in the bore of said second passageway of the body member for releasably connecting said second tubing string to said body member.

10. A device of the character set forth in claim 8 wherein the body member is provided with more than two passageways the second and each additional passageway through the body being of progressively smaller diameters said guide means on the upper end of the body being shaped to direct tubing strings of progressively smaller sizes to each of said passageways successively by size, each of said passageways of said body providing mutually exclusive flow passageways through the body independent of flow communication with the other passageways.

11. In a multiple zone well production apparatus; a well casing passing through upper and lower producing zones in a well bore, said casing having upper and lower openings through which production from said upper and lower zones can flow into the well casing; barrier means

in said casing between said upper and lower openings; a head having a plurality of longitudinal passages each without flow communication with the other passages; said head having means in one of said passages for securing a first tubular string to said head, said first tubular string extending to the top of said casing; tubular means connected to said means in said one of said passages for conducting fluid from the lower zone to said first tubular string to be conducted through said first tubular string without flow communication with the other passages of said body, said means in said one of said passages limiting longitudinal movement of said tubing string relative to said body and permitting rotation of said first tubing string with respect to the body; said head having means in another of said passages receiving a second tubular string extending to the top of the casing and providing a second flow conduit independent of flow communication with the flow conduit of the first tubular string for conducting fluid from the upper zone to the top of the well bore without communication with said fluids from said lower zone; said head having a guide surface inclined downwardly from said first passage to said another passage to guide the second tubular string into said another passage after said head has been lowered in the well bore on the first tubular string.

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