July 24, 1962 J. S. PAGE ET AL 3,045,755

VALVED PRODUCTION PACKER

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FIG. 1.

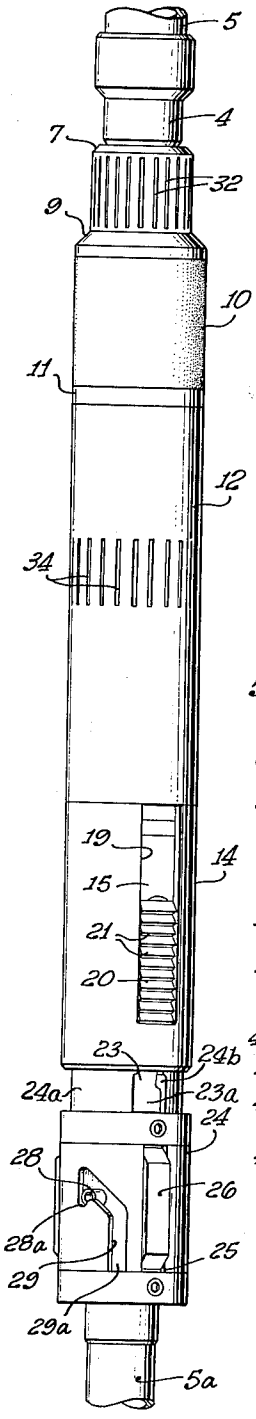


FIG. 2.

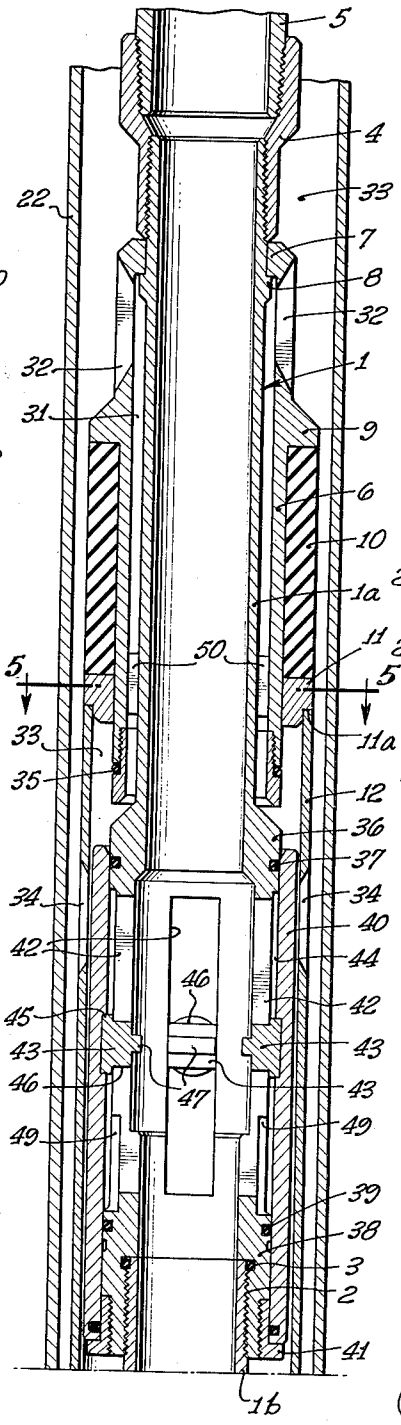
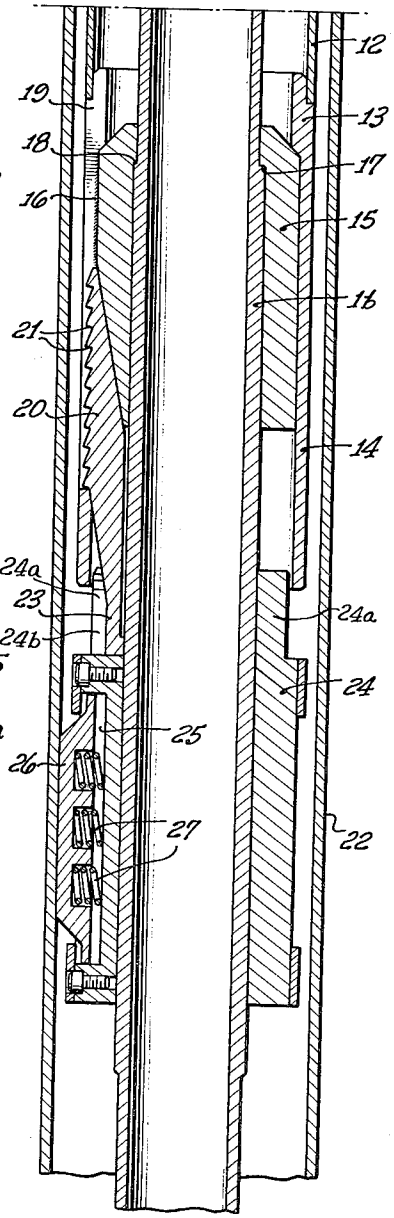


FIG. 2a.



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FIG. 3.

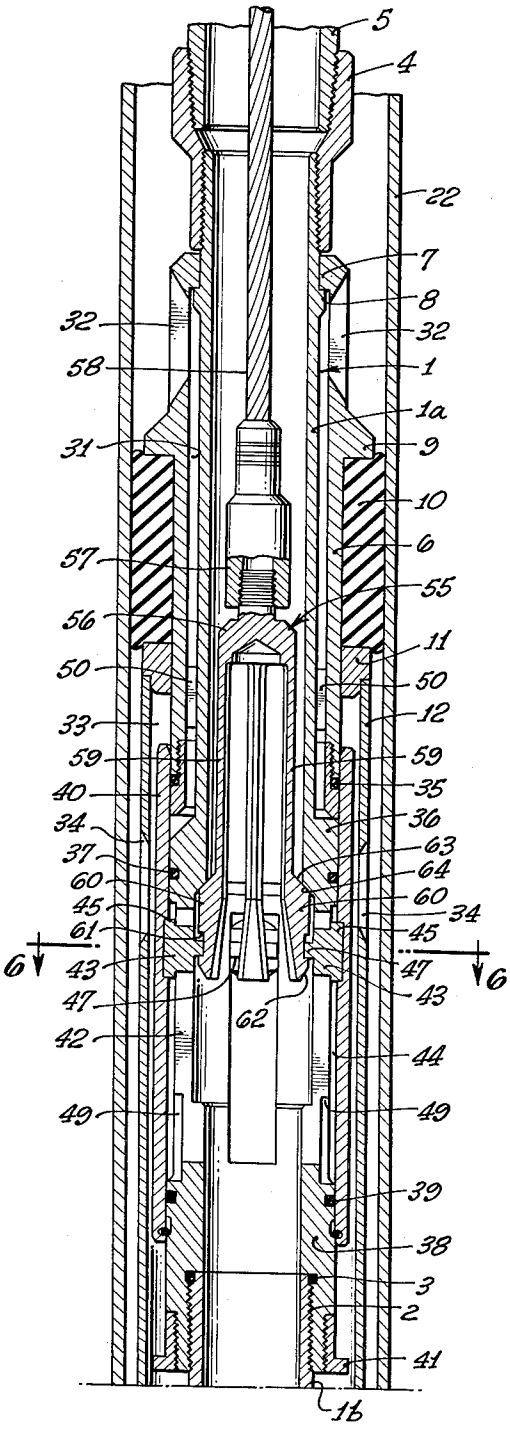
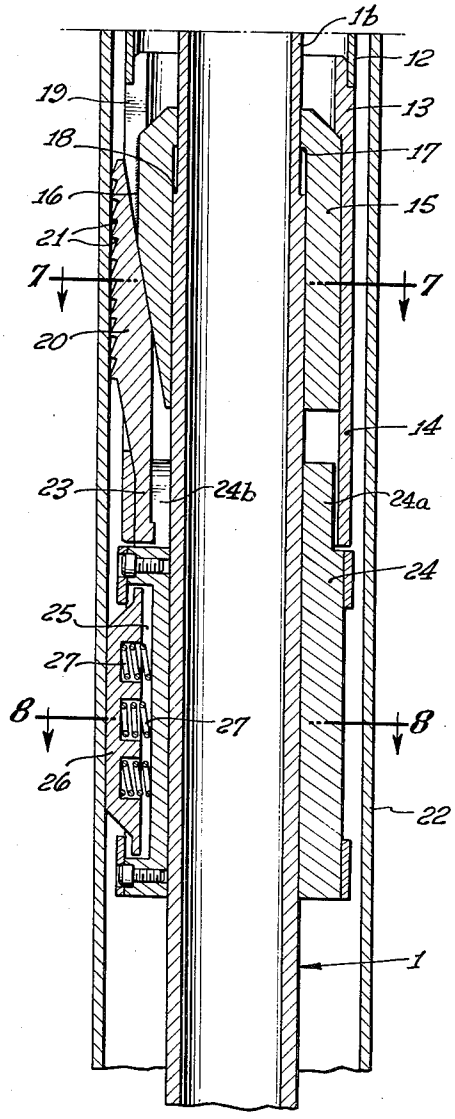


FIG. 3a.



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FIG. 4.

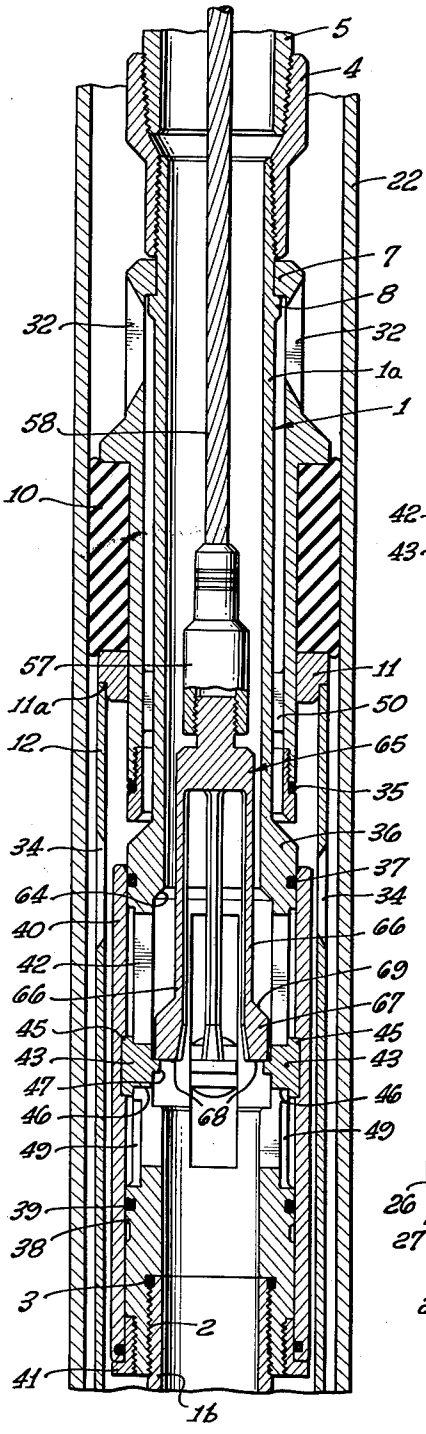


FIG. 5.

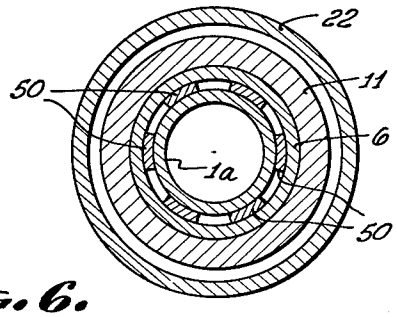


FIG. 6.

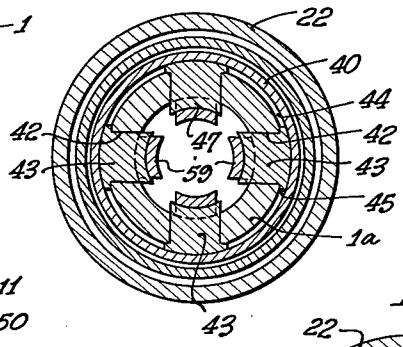


FIG. 7.

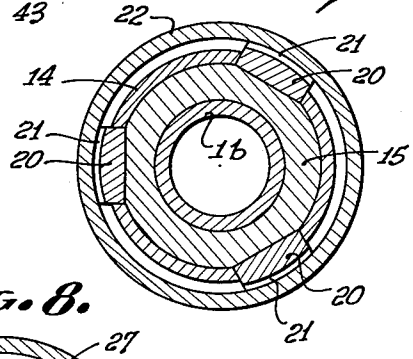
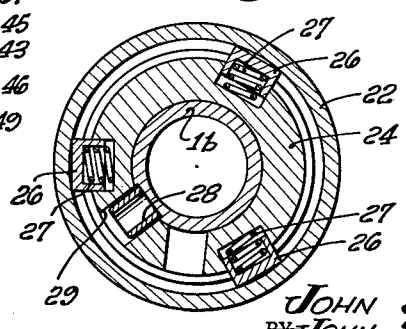


FIG. 8.



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VALVED PRODUCTION PACKER

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Filed Apr. 7, 1958, Ser. No. 726,901

15 Claims. (Cl. 166—129)

The present invention relates to well packers and more particularly to an improved packer of the so-called production type, but which may be employed for other operations wherein it is desirable to pack off the annulus between tubing and a well casing.

Oftentimes in the completion and production of oil and gas wells it becomes desirable to establish intercommunication between the well tubing and the annulus outside of the tubing within the casing, but when a packer has been set in the annulus then the establishment of such intercommunication is a problem. Heretofore, this has required the manipulation of the well tubing by which the packer is supported, in order to unset the packer, thus opening the annulus to the flow of fluid across the packer. Once the well head has been set up for production, tubing manipulation requires removal of the head with consequent expenditures of time and effort.

In accordance with a primary objective of the present invention, a packer assembly is provided which does not require tubing manipulation in order to establish intercommunication in the casing annulus outside the tubing string of the annular space above and below the packer.

Another object is to provide a packer assembly including a valve and a by-pass passage bridging the packer element, so that when the packer is set in engagement with the casing and the valve is open, fluid is free to flow through the by-pass passage, across the packer, thus establishing free communication between the space outside of the tubing above and below the packer.

A further object is to provide a valved packer having a by-pass passage bridging the packer element and wherein a sleeve valve is interposed between the packer mandrel and the housing about the mandrel, the sleeve valve being operable by a wire line tool to open or close the by-pass passage as may be desired.

As a result of the structure in accordance with the preceding objective, in order to selectively establish or interrupt the fluid intercommunication between the annular space above and below the packer element, it is only necessary to run a wire line into the tubing through the lubricator at the well head with a valve operating tool made in accordance with the invention on the wire line. Such an operation is a comparatively simple one as compared with dismantling the tubing head in order to enable manipulation of the tubing as is required in the case of hitherto known packers which must be released from engagement with the casing, or which include conventional tubing flow joints.

In completing wells it oftentimes is expedient to pump crude oil or other fluids down through the annulus between the casing and the tubing and back up through the tubing so as to flush drilling fluids from the well, and at the same time bring the well into production hydraulically by the flow of fluid upwardly through the tubing. In other instances it becomes necessary or desirable to kill a flowing well and this is accomplished preferably by pumping mud downwardly through the tubing and back up through the annulus outside the tubing. These operations may readily be performed in wells where a valved packer in accordance with the invention, and as contemplated by the preceding objectives, is installed.

Another object of the invention is to provide a packer structure including a by-pass passage bridging the packer

rubber, wherein an extremely simple yet durable assembly of the parts is attained. In this connection, a by-pass sleeve is provided, which encircles the packer mandrel in spaced relation thereto, with the packer rubber disposed about the by-pass sleeve and with the sleeve secured upon the mandrel by means of a conventional tubing coupling at one end of the mandrel.

Still another object is to provide a valved packer wherein a sleeve valve is concentrically disposed about a portion of the packer mandrel, the sleeve valve having a portion adapted to close a by-pass passage bridging the packer rubber, and also having operating parts projecting through longitudinally extended slots in the packer mandrel for engagement by a wire line tool, whereby axial movement of the valve sleeve may be readily accomplished.

Yet another object is to provide a valved packer in accordance with the preceding objective in combination with a valve operating wire line tool, wherein the tool and the packer mandrel have cooperatively engageable parts for effecting engagement of the wire line tool with the valve operating members within the mandrel, in an extremely simple yet efficient manner.

Other objects and advantages of the invention will hereinafter be described or will become apparent to those skilled in the art, and the novel features thereof will be defined in the appended claims.

Referring to the drawings:

FIG. 1 is an elevational view of a valved packer made in accordance with the invention; with the packer in condition for running into a well;

FIG. 2 is a vertical sectional view of the upper section of the packer of FIG. 1 showing the packer in a running in condition with the packer valve open;

FIG. 2*a* is a downward extension of FIG. 2 showing the packer control and anchoring section;

FIG. 3 is a view similar to FIG. 2 but showing the packer in a set condition and the valve closed, with a wire line tool made in accordance with the invention engaged with the valve;

FIG. 3*a* is a downward extension of FIG. 3 also showing the control and slip mechanism in a set condition;

FIG. 4 is a view similar to FIG. 3 showing the packer in a set condition but with the valve shown in an open position and engaged by a modified form of wire line tool made in accordance with the invention;

FIG. 5 is a transverse sectional view as taken on the line 5—5 of FIG. 2;

FIG. 6 is a transverse sectional view as taken on the line 6—6 of FIG. 3;

FIG. 7 is a transverse sectional view as taken on the line 7—7 of FIG. 3*a*;

FIG. 8 is a view in transverse section as taken on the line 8—8 of FIG. 3*a*.

Like reference characters in the several views of the drawings and in the ensuing description designate corresponding parts.

Referring particularly to FIGS. 1, 2 and 2*a*, the exemplary valved packer of the invention comprises a hollow mandrel 1 which is preferably composed of two coaxially interconnected mandrel parts 1*a* and 1*b* joined as by a threaded connection at 2 with a seal 3 therebetween. The upper extremity of the mandrel section 1*a* is threaded to receive a tubing coupling 4 for connection to the lower end of a tubing string 5 thereto in the conventional manner.

Adjacent its upper end the mandrel section 1*a* has fixedly mounted thereon a cylindrical packer body 6 having a radially inwardly projecting flange 7 at its upper end adapted to be disposed between the lower extremity of the coupling 4 and a radial projection 8 on the exterior of the

mandrel section 1*a* so as to support the body 6 upon the mandrel 1. Projecting radially outward from the body 6 is an abutment flange 9 providing an abutment for one end of a cylindrical packer rubber 10 which is disposed about the body 6.

Slidably disposed upon the body 6 and engaged with the other end of the packer rubber 10 is a pressure ring 11 having a seat 11*a* in which is engaged the upper end of a cylindrical body section 12 which is disposed about the mandrel section 1*a* and extends longitudinally into engagement with an extension 13 of a slip retainer housing 14, the latter being disposed about the lower mandrel section 1*b* and secured to a cone member 15 as by welding or the like at 16. Cone member 15 has a shoulder 17 engaged with a cooperative shoulder 18 on the mandrel so as to limit relative movement thereof in one direction.

The slip retainer housing 14 is provided with a plurality of longitudinally extended slots 19 in which are disposed wedge shaped slips 20 having wickers 21 thereon which, when the slips 20 are moved axially and therefore radially with respect to the cone 15 are adapted to engage the inner wall of well casing 22. Formed on the lower extremities of the slips 20 are tongues 23 disposed for engagement with a drag block carrier 24. Drag block carrier 24 has a plurality of upwardly extending circumferentially spaced slip-retaining lugs 24*a*, providing a plurality of circumferentially spaced undercut slots 24*b* in which the slips are retained by T heads 23*a* as best seen in FIG. 1. This is a conventional slip mounting construction.

The drag block carrier 24 is provided with a suitable number of circumferentially spaced longitudinally extended slots 25 therein for the reception of drag blocks 26 which are loaded by springs 27 into engagement with the casing 22 in a conventional manner. Frictional engagement of the drag blocks 26 with the casing is such that the carrier 24 will remain stationary in the casing as the mandrel is moved downwardly. However, in running the packer into a well on a tubing string 5 the drag block carrier 24 is normally releasably locked to the mandrel 1 by means of a pin 28 or other suitable key member carried by the mandrel as best seen in FIG. 8, and projecting into an inverted J slot 29 in the drag block carrier body 24.

It should be noted at this point that as shown in FIGS. 1 through 2*a* the members 6, 12 and 14 which are disposed about the mandrel are held in assembled relation between the shoulder 18 on the mandrel section 1*b* and the flange 7 on the cylindrical body 6, which flange is engaged with the lower end of the tubing coupling 4. However, when the pin 28, by virtue of the mandrel being elevated slightly and rotated relative to the drag block assembly is free to move downwardly in the vertical portion 29*a* with respect to the drag block assembly, the packer rubber engaging shoulder 9 of the body 6 will compress the packer between it and the ring 11 which is firmly backed up by the cylinder 12 engaging the slip retainer housing 14. The housing 14 in turn is rigidly connected to the cone member 15, the slip expander surface of which holds the slips 20 in engagement with the casing and prevents further downward movement of the cone member 15.

Disposed between the cylindrical packer body 6 and the mandrel section 1*a* is an annular space 31 communicating at one end with a series of longitudinal ports or slots 32 formed through the upper end of the body 6 and at its lower end with a space 33 defined between the cylinder 12 and the mandrel body section 1*a* thus to provide a by-pass bridging the packer 10 and establishing fluid intercommunication, through the annular space 33, between the ports 32 above the packer and additional slots or ports 34 formed in the cylindrical member 12 below the packer. An O-ring or other seal 35 is provided about the cylindrical body 6 adjacent its lower extremity and on an enlarged diameter portion 36 of the mandrel section 1*a* is a second O-ring or other seal 37.

It should be noted that the cylindrical surfaces containing the O-ring seals 35 and 37 are of the same diameter as a further cylindrical enlargement 38 formed on the mandrel section 1*a* in axially spaced relation to the enlarged section 36, the section 38 also having a seal such as an O-ring or the like generally designated 39. Axially, shiftably mounted upon the cylindrical sections 36 and 38 is a valve sleeve 40 which is movable in one direction into engagement with a stop 41 threaded upon the lower extremity of the mandrel section 1*a*.

When the valve sleeve 40 is in the position as shown in FIG. 2, that is in engagement with the stop 41, the by-pass 31 is open so that fluid is free to flow from either side of the packer 10 to the other, depending upon whether the fluid may be pumped down the tubing and returned up the annulus or down the annulus and returned up the tubing, as the case may be.

The mandrel section 1*a* intermediate the cylindrical sections 36 and 38 is provided with a plurality of axially extended slots 42 in which are slidably disposed a plurality of valve operating members 43. The diameter of the body section between the enlargements 36 and 38 is reduced so as to provide a clearance space 44, and the operating members 43 are provided with heads 45 which partially seat in complemental recesses in the inner periphery of valve sleeve 40. These heads 45 are of a diameter larger than the width of the slots 42, so that the operating members 43 are captive between the mandrel section 1*a* and the valve sleeve 40. The actuating members 43 are provided with a square shank 46 disposed in the slots 42 so as to prevent rotation of the members 43 therein, while at their inner extremities the actuator members 43 are provided with a rib 47 adapted to be engaged by an operating tool which will hereinafter be described.

In order to assemble the valve sleeve 40 upon the mandrel section 1*a* it is preferably place upon the enlarged sections 36 and 38 prior to installation of the stop nut 41 and prior to making up the mandrel sections 1*a* and 1*b* into the mandrel unit 1. However, prior to placing the valve sleeve on the mandrel section 1*a* the operating members 43 are disposed with their stems 46 in the lower extremities of the slots 42 and with their heads 45 recessed in enlarged pockets 49 which are adapted to accommodate the heads as the valve sleeve 40 is moved thereover. Once the members 43 are seated in the depressions in the inner peripheries of the valve sleeve 40 and moved upwardly into the slots 42 and the stop member 41 has been threaded on the body section 6 then the heads of members 43 cannot again move into the recesses 49 until the stop 41 is removed.

As has been previously mentioned the cylindrical body 6 is supported between shoulder 8 and coupling 4 by means of a radial flange 7, and defines with the mandrel section 1*b* an annular space 31. In order to centralize the body section 6 about the mandrel section 1*b*, a plurality of spacer elements 50 are disposed between these sections and are preferably welded or otherwise suitably secured to one of the sections. Any suitable number of such spaces 50 may be employed in circumferentially spaced relation as shown more particularly in FIG. 5.

The packer as shown in FIGS. 1, 2 and 2*a* is in condition for running into a well with the packer unset and the slips 20 retracted. As the tool is moved downwardly through the well casing, the drag block assembly 24 will move downwardly therewith being keyed to the mandrel by the pin 28 engaged in the short vertical leg 28*a*, of J-slot 29. When it is desired to set the tool the running-in string of tubing 5 will be elevated slightly so as to raise the pin 28 out of the short leg 28*a* just referred to, and the tubing will then be rotated until the pin 28 is free to move downwardly into the vertical leg 29*a*, of the J-slot, whereupon; as weight is set down upon the assembly, the drag blocks 26 will frictionally

resist downward movement of the drag block assembly 24 and will consequently prevent downward movement of the slips 20. However, downward movement will be imparted to the body sections 6 and 12, the latter engaging at its lower extremity with the expander cone carrier 14 so that the cone will correspondingly move downwardly to effect a lateral camming of the slips 20 into tight engagement with the casing 22, the wickers 21 biting into the casing and being firmly set. It will be noted that downward movement of the cylindrical body section 12 is effected through the packer element 10 which is backed up by the radial flange 9 on the body section 6. Since the packer expander ring 11 is slidably mounted upon the cylindrical body 6, the packer element 10 will be expanded into engagement with the casing as shown in FIG. 3 and in FIG. 4, when the body section 12 is prevented from moving further downwardly as the slips 20 are tightly engaged with the casing.

In order to release the packer and the slips from engagement with the casing wall, the tubing string is lifted until the annular shoulder 18 on the mandrel section 1*b* engages with the shoulder 17 at the upper end of the expander cone 15; whereupon the expander will be moved upwardly with respect to the slips 20, so as to free the latter from engagement with the casing and the co-engaged shoulders 17 and 18, as viewed in FIG. 2*a*, will tie the slip setting cone to the mandrel.

The packer hereof is preferably run into a well with the valve sleeve 40 disposed in the position shown in FIG. 2, that is with its lower extremity engaged with the stop 41. With the valve so disposed fluid intercommunication is effected between the annulus formed by the casing and the running-in string 5, and the annulus between the packer body cylinder 12 and the casing through the by-pass passage 31 and the ports 32 and 34 in the body section 6 and the body section 12, respectively. Accordingly, fluid such as crude oil or the like may be pumped from the well head down through the casing annulus through the by-pass passage 31, across the packer element 10, down to the bottom of the well or down to the bottom of a downwardly projecting section of tubing 5*a*, and thence up through the tubing to the well head, so as to circulate drilling or other fluid in the well out of the well, and so as to bring the well in hydraulically. Following this, the valve 40 will be closed by shifting the same vertically to the position shown in FIG. 3.

According to one of the objectives of the invention, a valve operating tool is provided for use in closing the valve 40. Such a tool is generally designated 55 in FIG. 3, and generally comprises an attachment head 56 adapted to have threadedly mounted thereon a rope socket 57 of a wire line 58. If desired, a sinker bar (not shown) may be disposed between the attachment head 56 and the rope socket 57 so as to provide additional weight for forcing the tool downwardly through the tubing 5 and the hollow mandrel 1.

Projecting downwardly from the attachment head 56 of the tool 55 are a plurality of circumferentially spaced flexible fingers 59, having terminal enlargements 60 in each of which is formed a notch 61 adapted for engagement with the operating projections 47 of the operating members 43 carried by valve sleeve 40. At its lower end each enlargement 60 is provided with a bevelled camming surface 62 which is adapted to engage with the respective operating projections 47 of the members 43 so as to cam the fingers 59 inwardly as the tool moves downwardly, so that the notches 61 may be brought into engagement with the projections 47. Following engagement of the tool with the valve operating members 43, as just described, the wire line will be elevated so as to shift the valve to the position shown in FIG. 3, thus bringing into engagement an inclined surface 63 on enlargements 60 of the spring fingers 59, and a cooperative inclined surface 64 interiorly of the mandrel section 1*a*, so as to cam the spring fingers 59 radially inwardly, thus disengaging the notches 61 from the members 43 and freeing the tool for upward movement through the mandrel and out of the tubing.

If it should become desirable to kill a well by pumping weighted fluid such as drilling fluid down into the well, or if for any other reason it should become desirable to open the valve 40, then in accordance with another feature of the invention, a modified form of tool as generally designated at 65 in FIG. 4 may be employed. Like the tool 55, the modified tool 65 is adapted to be connected to a rope socket 57 on a wire line 58 and includes spring fingers 66 having enlargements at their terminal ends as indicated at 67, these enlargements being provided with a flat end 68 for engagement with the operating projections 47 of the members 43 so as to shift the valve downwardly to the position shown in FIG. 4; whereupon the tool 65 may be retrieved and inclined surfaces 69 on the enlargements 67 will engage the annular mandrel surface 64 previously referred to, thus to wedge the spring fingers 66 inwardly to permit retrieval of the tool.

From the foregoing it will be noted that the operating tool 55 is characterized as a valve closing tool, since it is incapable of reopening the valve once the tool is engaged with the operating members 43 and being retrieved while the valve remains open. On the other hand, the tool 65 is characterized as a valve opening tool since it is incapable of closing the valve.

While the specific details of the invention have been herein shown and described, changes and alterations may be resorted to without departing from the spirit thereof as defined in the appended claims.

We claim:

1. In a well packer of the type including a mandrel adapted to be connected to a running-in string of tubing and having an axially extended opening therethrough; an expansible packer element disposed about said mandrel; and means for effecting expansion of said packer element into engagement with the well wall for packing off the annulus between the running-in string and the well wall; that improvement comprising: means providing a by-pass passageway bridging said packer element and communicating with the annulus at opposite ends of the packer element; valve means for opening and closing said passageway; and means for operating said valve means including a member connected to said valve means and having a portion disposed in said mandrel opening; and an actuator tool movable in said mandrel opening and having means for releasably engaging said portion of said member to shift the same.

2. In a well packer of the type including a mandrel adapted to be connected to a running-in string of tubing and having an axially extended opening therethrough; an expansible packer element disposed about said mandrel; and means for effecting expansion of said packer element into engagement with the well wall for packing off the annulus between the running-in string and the well wall; that improvement comprising: means providing a by-pass passageway bridging said packer element and communicating with the annulus at opposite ends of the packer element; valve means for opening and closing said passageway; means for operating said valve means including a member connected to said valve and having a portion disposed in said mandrel opening; and an actuator tool movable in said mandrel opening and having means for releasably engaging said portion of said member to shift the same; and means for disengaging said tool from said valve means upon movement of said valve means.

3. A packer of the type described comprising: a mandrel; a body disposed about said mandrel; said body and said mandrel being disposed in radially spaced relation and defining a passageway therebetween; a packer element on said body; means for expanding said packer element for engagement with a well wall; valve means for selectively opening and closing said passageway; said valve means including a sleeve shiftably disposed upon said mandrel;

said mandrel having an opening therein; and said valve sleeve having an operator member projecting through said opening into said mandrel.

4. A packer of the type described comprising: a mandrel having an opening extending longitudinally therethrough; a body disposed about said mandrel; said body and said mandrel being disposed in radially spaced relation and defining a passageway therebetween; a packer element on said body; means for expanding said packer element for engagement with a well wall; valve means for selectively opening and closing said passageway; said valve means including a sleeve shiftably disposed upon said mandrel; said mandrel having a lateral opening therein leading into said longitudinal opening; and said valve sleeve having an operator member projecting through said lateral opening into said longitudinal opening; and an operating tool movable into said longitudinal opening and having means for releasably engaging said operator member so as to shift said valve sleeve on said mandrel.

5. A packer of the class described, comprising a mandrel; a cylindrical body disposed about said mandrel; a packer element disposed about said body; said body having a shoulder engaged with said packer element at one end; shiftable means engaged at one end with the other end of said packer including a member disposed about said mandrel; a cone shiftably disposed upon said mandrel and engaged with said member at its other end; a plurality of slips disposed in the path of said cone for radial expansion of the slips upon relative axial movement of said cone and said slips; and a shoulder on said mandrel engageable with said cone for preventing relative movement therebetween in one direction; means providing a passageway leading externally of said body and said member and bridging said packer element for establishing the flow of fluid across said packer; and valve means including a sleeve slidable on said mandrel for engagement with said body for selectively opening and closing said passageway.

6. A packer of the class described comprising: a mandrel; a cylindrical body secured to said mandrel in radially spaced relation thereto; a shoulder on said body; a packer element disposed upon said body and engaged with said shoulder at one end; a packer expander slidably mounted on said body and engageable with the other end of said packer element; means for relatively shifting said expander and said shoulder to expand said packer element upon movement of the body in one direction including a member disposed about said mandrel and extending longitudinally thereof; co-engaged cone and slip means for retaining said expander element in a packer element expanding position; said body and said member having ports therein communicating with the space between said mandrel and said body and providing a passageway bridging said packer element; valve means for selectively opening and closing said passageway including a cylindrical part on said body; a cylindrical part on said mandrel; said passageway passing between said cylindrical parts; and a valve sleeve slidable on one of said cylindrical parts into engagement with the other of said parts.

7. A packer of the class described comprising: a mandrel; means on said mandrel including a resilient packer element for packing off a well space about the packer; means for expanding said packer element; said mandrel having means providing a by-pass passage bridging said packer element; and valve means movably carried by said mandrel for opening and closing said passage; said valve means including an operator member disposed in said mandrel for engagement by a wire line operating tool.

8. A packer of the class described comprising: a mandrel; means on said mandrel including a resilient packer element for packing off a well space about the packer; means for expanding said packer element; said means on said mandrel also providing a by-pass passage bridging said packer element; said latter means including a pair of axially spaced portions on said mandrel; and a sleeve valve slidably mounted on said members for opening and closing the space therebetween; said valve means including an operator member disposed in said mandrel for engagement by a wire line operating tool.

9. A packer of the class described comprising: a mandrel; means on said mandrel including a resilient packer element for packing off a well space about the packer; means for expanding said packer element; said means on said mandrel including means providing a by-pass passage bridging said packer element; said latter means including a plurality of axially spaced cylindrical members; said by-pass passage passing between said cylindrical members; said by-pass passage passing between said cylindrical members; a sleeve valve slidably mounted on one of said members and movable to a position slidably engaged with the other cylindrical member to close said by-pass passage and means on said sleeve valve for operating said sleeve valve.

10. A packer of the class described comprising: a mandrel; means on said mandrel including a resilient packer element for packing off a well space about the packer; means for expanding said packer element; said means on said mandrel also providing a by-pass passage bridging said packer element; said latter means including a plurality of axially spaced cylindrical members; said by-pass passage passing between said cylindrical members; a sleeve valve slidably mounted on one of said members; said mandrel having an opening therein axially spaced from the space between said pair of said members; an operating element carried by said sleeve valve and projecting through the opening into said mandrel; and means on said element interiorly of said mandrel for engagement by an operating tool for shifting said valve sleeve across said by-pass passage into engagement with the other of said cylindrical members.

11. A packer of the class described comprising: a mandrel; means on said mandrel including a resilient packer element for packing off a well space about the packer; means for expanding said packer element; said means on said mandrel also providing a by-pass passage bridging said packer elements; said latter means including a pair of axially spaced cylindrical members through which said passage passes; a sleeve valve slidably mounted on one of said cylindrical members and slidable into engagement with the other cylindrical member to close said passage; said mandrel having an opening therein axially spaced from the space between said pair of members; an operating element carried by said sleeve valve and projecting through the opening into said mandrel; and a wire line tool having means releasably engageable with said operating element for shifting said valve sleeve.

12. A packer of the class described comprising: a mandrel; means on said mandrel including a resilient packer element for packing off a well space about the packer; means for expanding said packer element; said means on said mandrel also providing a by-pass passage bridging said packer element; said latter means including a plurality of axially spaced cylindrical members; said by-pass passage passing between said cylindrical members; a sleeve valve slidably mounted on one of said members and shiftable to a position engaging another of said cylindrical members and closing said passage; said mandrel having an opening therein axially spaced from the space between said pair of said members; an operating element carried by said sleeve valve and projecting through the opening into said mandrel; a wire line tool; said tool comprising a head; a plurality of spring fingers depending from said head and having free ends; and coengageable means on said free ends of said fingers and said operating element for shifting said valve sleeve.

13. A packer of the class described comprising: a mandrel; means on said mandrel including a resilient packer element for packing off a well space about the packer; means for expanding said packer element; said means on

said mandrel also providing a by-pass passage bridging said packer element; said latter means including a pair of axially spaced cylindrical members; said by-pass passage passing between said cylindrical members; a sleeve valve slidably mounted on one of said members and shiftable to a position engaging another of said cylindrical members and closing said passage; said mandrel having an opening therein axially spaced from the space between said pair of said members; an operating element carried by said sleeve valve and projecting through the opening into said mandrel; a wire line tool; said tool comprising a head; a plurality of spring fingers depending from said head and having free ends; coengageable means on said free ends of said fingers and said operating element for shifting said valve sleeve; and cooperative means on said fingers and said mandrel for disengaging said coengageable means upon movement of said valve sleeve in one direction.

14. A packer of the class described comprising: a mandrel section and a body section disposed about said mandrel; a packer element carried by said body section and expansible into engagement with the wall of a well; means for expanding said packer element; said mandrel and said body sections having means providing a by-pass passageway therebetween bridging said packer element; and valve means including a valve sleeve slidable on one of said sections into engagement with the other of said sections to selectively open or close said passageway.

15. In a well packer of the type including a mandrel connectable to a running-in string of tubing; an expansible packer element disposed about said mandrel; and means on said mandrel for effecting expansion of said packer element into engagement with the well wall upon manipulation of said tubing; the improvement comprising means supporting said packer element on said mandrel and providing a fluid passage bridging said packer element; means for enabling fluid to by-pass said packer element and for preventing such fluid to by-pass independently of manipulation of said tubing string; said latter means including a valve sleeve slidably supported by said mandrel; said means supporting said packer having ports at opposite ends of the packer element communicating with said fluid passage; said sleeve being slidable to and from positions opening and closing off communication between said ports; and means on said sleeve engageable by an operating tool for moving said sleeve to said positions.

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