May 5, 1959 T. P. HOFFER 2,885,007

ANCHORING DEVICE

Filed Oct. 13, 1954 3 Sheets-Sheet 1

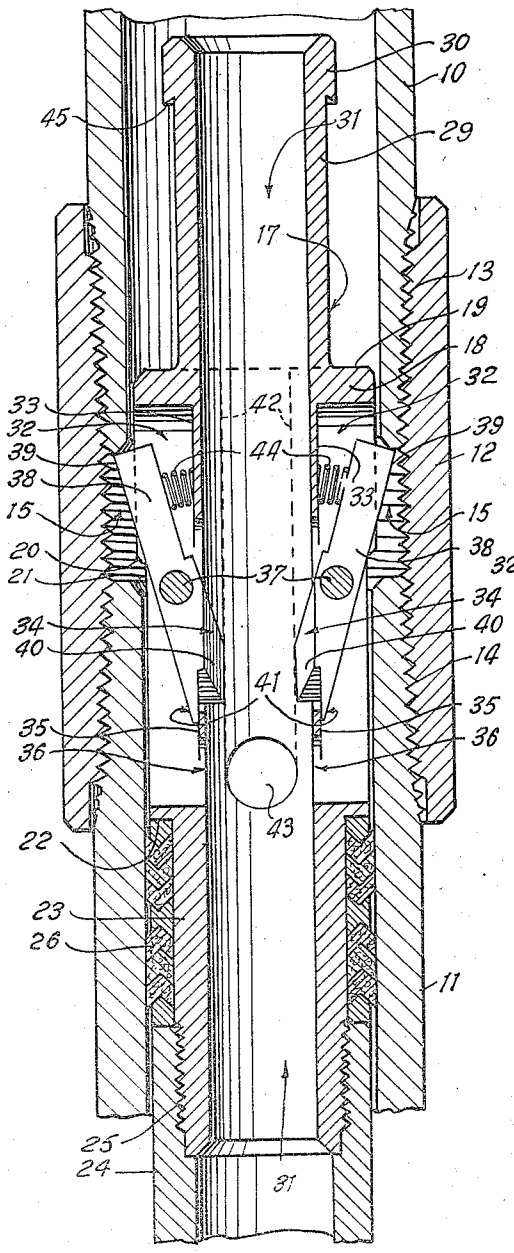

Fig. I

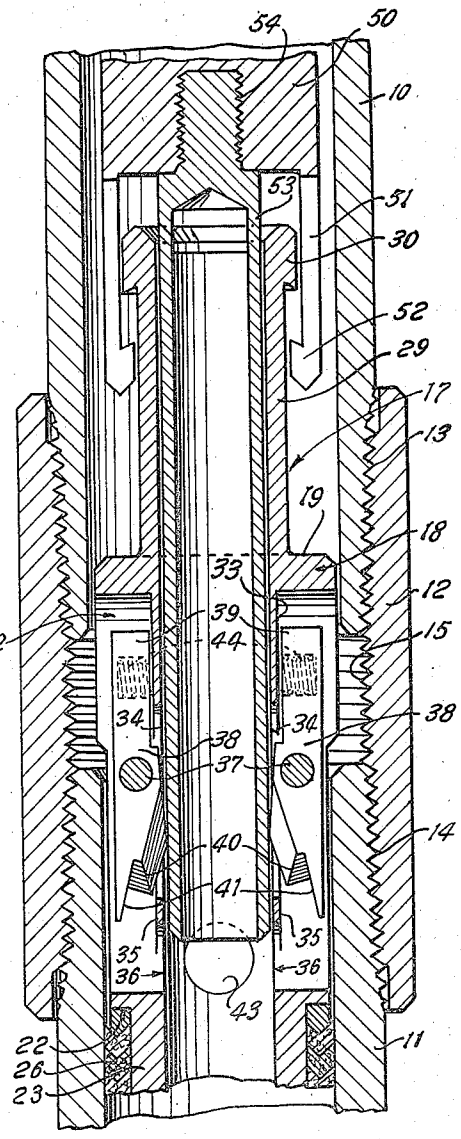

Fig. II

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ANCHORING DEVICE

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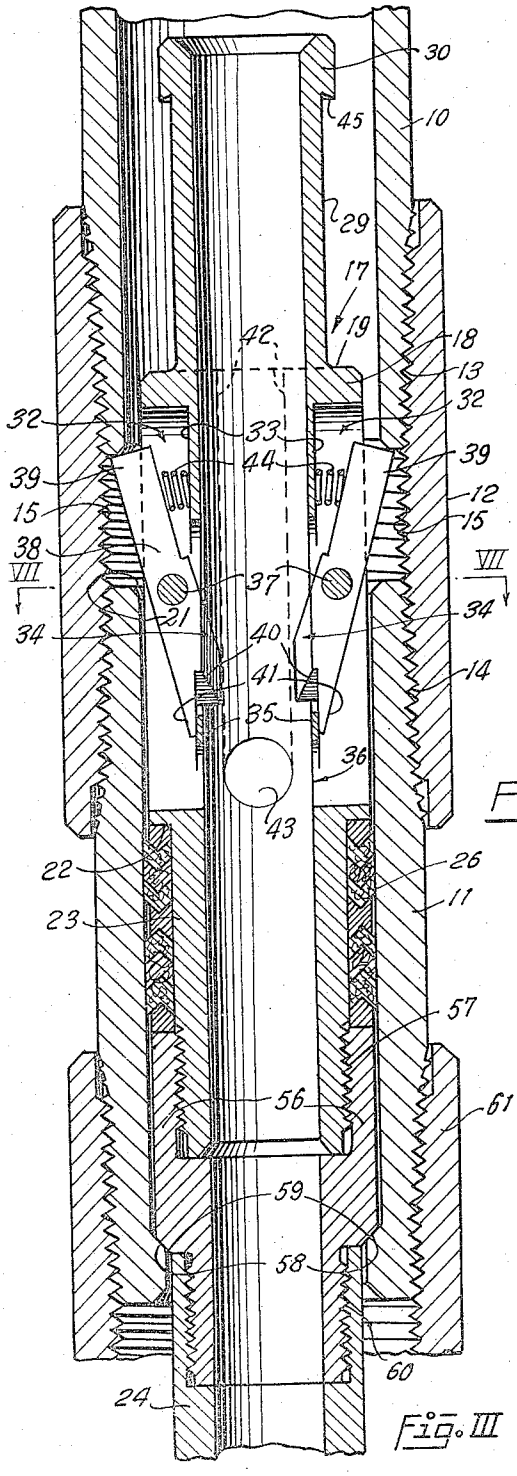

Fig. III

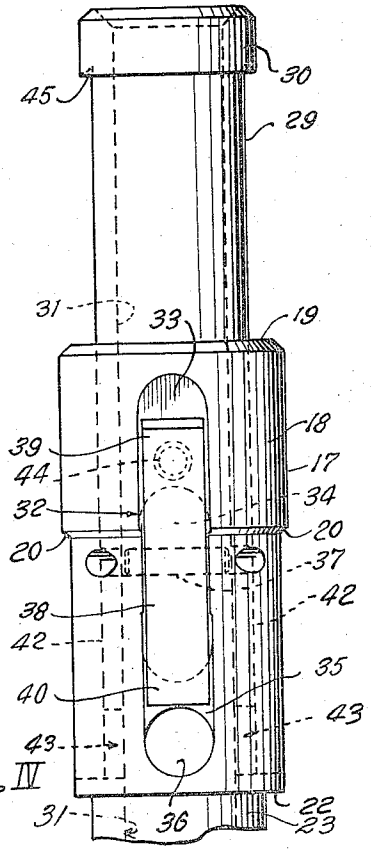

Fig. IV

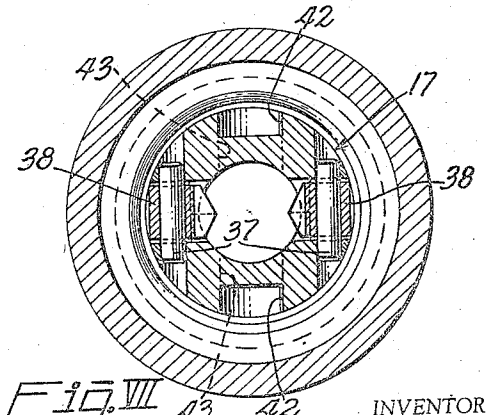

Fig. VII

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ANCHORING DEVICE

Filed Oct. 13, 1954 3 Sheets-Sheet 3

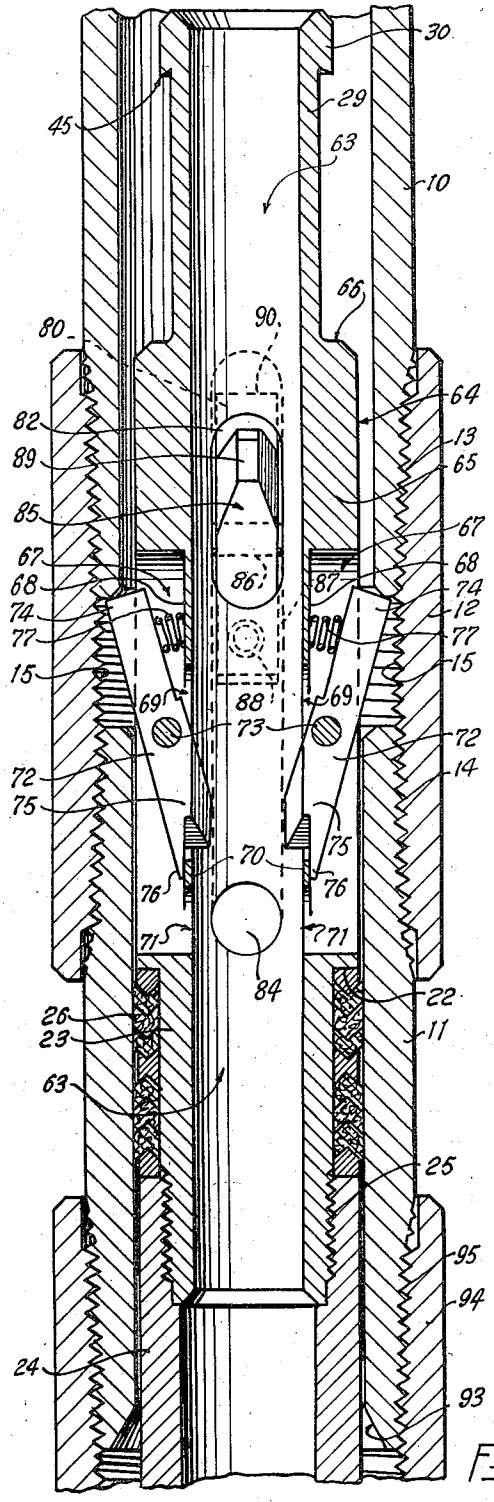

Fig. V

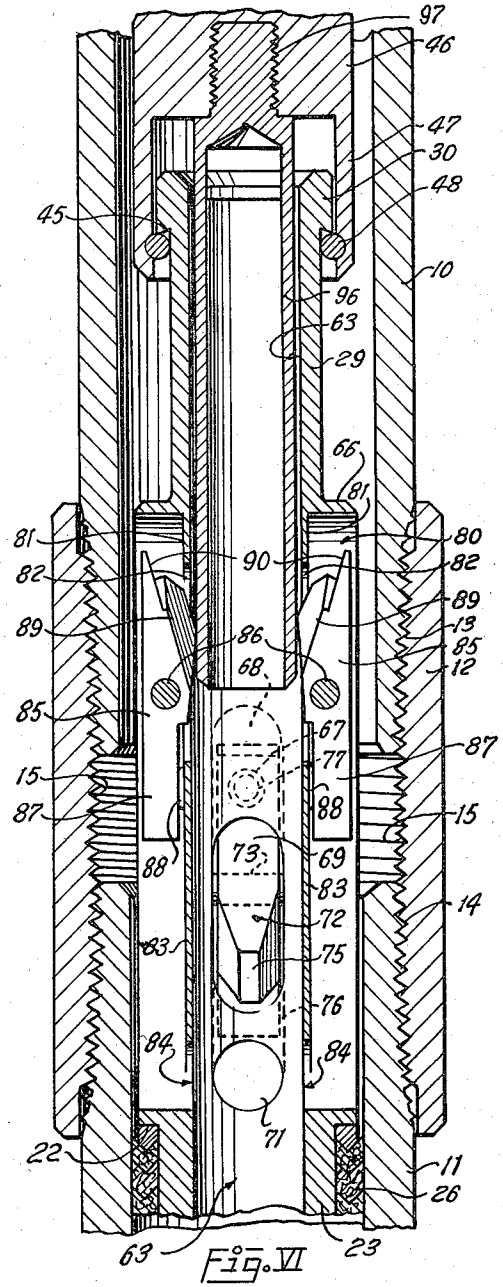

Fig. VI

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United States Patent Office 2,885,007 Patented May 5, 1959

2,885,007

ANCHORING DEVICE

Temple P. Hoffer, Dallas, Tex.

Application October 13, 1954, Serial No. 462,037

8 Claims. (Cl. 166—136)

This invention is concerned with an anchoring device, and is particularly concerned with a device for removably anchoring flow control and directing devices inside the tubing string in an oil well.

Various types of flow control and directing devices are removably inserted in special housings or nipples provided as a part of the tubing string in an oil well; and often it is necessary to remove such subsurface flow control devices and replace them with flow control devices for different purposes.

Such flow control devices are customarily placed in the well tubing, and retrieved therefrom, by so-called "wire line" equipment, lowered through the tubing, and operated from the earth's surface.

Therefore, it is necessary to provide means for removably locking the subsurface flow control devices in the nipple or housing; and such means must include mechanism for locking and unlocking the anchoring equipment by wire line operation from the surface.

Frequently, in designing such subsurface flow control devices for use under certain conditions, it is necessary to use an anchoring device that locks at or near the top of a landing nipple and having sealing elements thereon employed to pack-off pressure around the outside of the anchoring device.

Furthermore, it is often necessary to lower a locking device through several seating nipples and to lock a flow control device in a selected seating nipple therebelow.

Locking devices heretofore used have usually employed locking dogs which had to be moved into locking position, inside the seating nipple or housing, by a complicated mechanical arrangement requiring relative motion between a special locking mandrel and the locking dogs. These old devices usually employed separate carriers on the outer side of the mandrel therefor to support the locking dogs. Such complicated mechanism and multiplicity of parts, used in connection with such locking devices, obviously restricted the axial flow passage through the locking device, necessitated involved operating technique, and the employment of complicated setting and pulling tools.

The use of such multiplicity of parts in locking devices, of the type mentioned, has also increased the prevalence of malfunction, and inoperativeness of such devices due to sand and sediment in the well settling on or about the operating parts; and often the sediment settled about the fishing neck on the locking device to such an extent that it could not be engaged by a retrieving tool.

This invention, among other purposes, is intended to eliminate the foregoing objections to prior anchoring devices of the type referred to.

It is, therefore, a primary object of this invention to provide an anchoring and pack-off device which has greater internal flow area therethrough by reason of the elimination of the mechanism or carriers outside the main body of the locking device.

Another important object of this invention is to provide

an anchoring device with flow passages through the wall thereof below the latching lugs and the fishing neck thereon to prevent sediment from settling about the latching lugs and the fishing neck.

A still further object of this invention is to provide a locking device which may be automatically locked in an annular recess in a tubing string without the employment of a mandrel, or other member, moved relatively to the locking lugs.

Another object of this invention is to provide simple and positive means for unlocking the locking lugs for retrieving the tool, without jarring down on the locking device, as required in previous devices.

A general object of this invention is to provide a simple, positive and easy to operate anchoring device for removably anchoring flow control devices in a well tubing.

Other and further objects of my invention will become apparent upon reading the detailed specification hereinafter following, and by referring to the drawings annexed hereto, and made a part hereof.

Suitable embodiments of my invention are shown in the attached drawings wherein:

Fig. I is a cross-sectional elevational view of a preferred form of my anchoring device releasedly anchored in a string of well tubing, and supporting a flow control device therebelow.

Fig. II is a cross-sectional elevational view showing my anchoring device after having been unlatched from the annular recess, with which the lugs thereon have been engaged, by means of the tubular unlatching member insertable in the bore of the anchoring device.

Fig. III is a cross-sectional elevational view of a modified form of my anchoring device wherein the stop for limiting the downward movement thereof is provided at the lower end of the anchoring device.

Fig. IV is a side elevational view of the preferred form of the anchoring device shown in Fig. I.

Fig. V is a cross-sectional elevational view of another modified form of anchoring device, having two sets of latching lugs thereon arranged to latch the anchoring device against upward or downward movement in a well tubing.

Fig. VI is a cross-sectional elevational view of the modified form of anchoring device shown in Fig. V, which sectional view is taken on a vertical plane 90 degrees from that in Fig. V, and wherein a special running tool is employed to hold the upper set of latches in unlatched position while the anchoring device is being run into the tubing.

Figure VII is a horizontal cross-sectional view taken on the line VII—VII of Figure III.

Numeral references are employed to designate the various parts shown in the drawings, and like numerals indicate like parts throughout the various figures of the drawings.

Referring, first, to the form shown in Figs. I, II and IV, the numeral 10 indicates a section of a tubing string which extends into a well casing (not shown) from the earth's surface to a point adjacent a zone or zones of production in a well.

The section of tubing 10 is joined to a seating nipple 11 by means of a standard coupling 12 which is joined to the section of tubing 10 by means of companion threads 13 and to the seating nipple 11 by means of companion threads 14. The ends of the tubing section 10 and the seating nipple 11, respectively, are spaced apart in the coupling 12, so as to provide an annular recess 15 within the coupling 12.

The anchoring device, which is removably engaged in the coupling 12, includes an integral cylindrical body 17, which cylindrical body is comprised of an enlarged

cylindrical mid-section 18, a fishing neck 29 extending upwardly therefrom, and a lower end of reduced diameter 23, about which conventional packing material 26 may be disposed.

An upwardly facing shoulder 19 is provided at the upper end of the enlarged cylindrical mid-section 18 of the body 17, and a downwardly facing beveled annular stop shoulder 20 is arranged about the mid-section 18.

The stop shoulder 20 is arranged to engage with the upwardly facing beveled shoulder 21, provided at the upper end of the seating nipple 11, to limit the downward movement of the anchoring device in the tubing string.

When the shoulders 20 and 21 engage and stop the downward movement of the anchoring device, the operator knows that the latching lugs 38 are in position to engage in the recess 15 to lock the anchoring device against upward movement.

The reduced end portion 23 of the cylindrical body 17 povides a downwardly facing annular shoulder 22 about the cylindrical body, and conventional chevron-type, resilient packing rings 26 are clamped between the shoulder 22 and the upper end of the subsurface flow control device 24, which is attached to the reduced portion 23 of the cylindrical body 17 by means of companion threads 25.

The packing material 26 seals against the flow of fluid between the reduced portion 23 of the head 17 and the inner wall of the seating nipple 11.

The subsurface flow control device, a section of which is indicated at 24, may be any type of such devices customarily used to direct and control the flow of fluids through or from the tubing in an oil well. The anchoring device, below which the flow control device is attached, detachably latches the flow control device in place at the desired level inside the well tubing.

The fishing neck 29, which forms an integral part of the cylindrical body 17 of the anchoring device, has an enlarged head 30 thereon with which a conventional wire line operated, socket-type, setting tool or retrieving tool can be detachably engaged in the usual manner, for the purpose of lowering the anchoring device into a well tubing or for retrieving it from the well tubing.

The body 17 of the anchoring device has a central axial bore 31 extending therethrough, through which fluid produced from the well, through the tubing string, may flow.

A pair of elongated diametrically opposed slots 32 are cut in the wall of the enlarged portion 18 of the cylindrical body 17 from the outer side thereof. The slots 32 are not cut entirely through the wall of the cylindrical body at the upper ends thereof, which leaves a relatively thin wall portion 33 at the upper end of each slot 32. Therebelow the slots 32 are cut entirely through the wall of the cylindrical body 17 to provide oppositely disposed elongated passages 34 approximately mid-way of the ends of each of the slots 32. Spaced from the passages 34, and communicating with the slots 32, are ports 36, oppositely disposed, extending entirely through the wall of the body 17 at the lower ends of slots 32. A relatively thin web 35, forming a part of the wall of the body 17 remains in each of the slots 32 and separates the passages 34 and the ports 36.

A pair of pivoted spring latches or spring urged latching lugs 38 are pivotally mounted in the oppositely disposed slots 32 and are arranged to pivot about pivot pins 37, which pass through the latching lugs 38 and into the wall of the enlarged portion 18 of the cylindrical body 17, on opposite sides of the slots 32, as clearly indicated at Fig. IV.

The springs 44 are engaged between the upper ends 39 of the locking lugs 38 and the thin wall portions 33 in the slots 32. The springs 44 are arranged to normally urge the upper ends 39 of the locking lugs 38 outwardly, so that when the upper ends 39 of the locking lugs 38 are moved adjacent the recess 15, the upper ends 39 are urged outwardly by the springs 44 into said recess to lock the anchoring device against upward movement, as shown in Fig. I.

The lower ends 40 of the locking lugs 38 each has a finger 41 extending therefrom.

When the upper ends 39 of the locking lugs 38 are moved outwardly into locking engagement with the recess 15, the inner sides of the lower ends 40 of the lugs 38 extend inwardly of the bore 31 of the anchoring device through the passages 34. The fingers 41 are engageable with the webs 35 to limit the inward movement of the lower ends 40 of locking lugs 38.

On diametrically opposite sides of the enlarged midsection 18 of the body 17 are cut a pair of flow channels 42. The flow channels 42 are preferably spaced 180 degrees apart about the circumference of the midsection 18 and are spaced 90 degrees from the slots 32. Each channel 42 is cut substantially the depth of the width of the shoulder 19 and terminates at a point near the lower end short of the shoulder 22. At the lower end of each of the channels 42 is cut a flow orifice 43, which extends entirely through the wall of the body 17, and communicates with the bore 31 of the anchoring device.

When the anchoring device is latched in place in the tubing string, in the manner shown in Fig. I, a part of the fluid produced from the well flows upwardly through the bore 31, from below and outwardly through the flow orifices or passages 43 and through the grooves 42 and about the fishing neck 29. Also, a portion of such fluid will flow through the flow ports 36, through the passages 34, through the slots 32, about the latching lugs 38, and upwardly about the fishing neck 29. Such flow of fluid about the mid-section 18 of the body 17, and about the fishing neck 29 thereof, flushes out any sand or other sediment and prevents it from settling about the latching lugs 38 and about the fishing neck 29, thus allowing the fishing neck to be easily engaged by a wire line retrieving socket for removal. Such flow of fluid also prevents the latching lugs 38 from becoming frozen, in inoperative position, by such sediment settling thereon.

Thus, the anchoring device is self-flushing by the natural flow of fluids in the well.

The anchoring device shown in Figs. I, II and IV may be run into a well tubing and latched in place in the following manner:

A wire line running socket like that shown at 46 in Fig. VI, and described hereinafter, is engaged with the head 30 of the fishing neck 29 by passing the skirt 47 downwardly over the head 30 and securing the skirt 47 in engagement with the head by means of shear pins 48, which pass through the skirt 47 underneath the annular shoulder 45 of head 30.

A sub-surface flow control device 24 is then attached to the lower end of the anchoring device, and the assembly, comprised of the anchoring device, the subsurface flow control device and the running tool, is lowered into the tubing on a wire line in the usual manner.

As it moves downwardly, the upper ends 39 of the locking lugs 38 engage the inner walls of the tubing and are pressed inwardly against the springs 44, as the tool slides downwardly through the tubing. When the shoulder 20 on the anchoring device engages the shoulder 21 at the upper end of the seating nipple 11, the operator knows that the latching lugs 38 are in position to engage in the recess 15 to prevent upward movement of the anchoring device.

It may be necessary to jar the anchoring device into the seating nipple 11, by conventional jars (not shown) carried by the wire line, because of frictional engagement of the packing 26 with the walls of the seating nipple 11. Only slight jarring action will be necessary to move the packing into the seating nipple.

When the anchoring device is in position, with the latching lugs 38 in engagement with the recess 15, and with the shoulders 20 and 21 in engagement, the running

tool socket may be disengaged from the head 30 on the fishing neck 29 by jarring upwardly thereon with a conventional jar until the shear pins 48 are sheared, allowing the skirt 47 on the running socket to be freed of engagement with the head 30. The running tool may then be withdrawn from the tubing on the wire line, leaving the anchoring device, and the subsurface flow control device carried thereby, disengageably locked in the tubing, as shown in Fig. I.

When it is desired to retrieve the anchoring device, and the subsurface flow control device carried thereby, from the tubing, a conventional wire line pulling socket, such as shown at 50, it attached to a wire line and lowered into the tubing. The conventional socket 50 has the usual resilient prongs 51 thereon which have enlarged engaging heads 52 at the outer ends thereof.

To the conventional wire line pulling socket 50 is added an elongated cylindrical member 53, which may be either solid or tubular, and is threadedly engaged inside the socket 50 by companion threads, as indicated at 54. The pulling tube 53 is threadedly engaged with the retrieving socket 50 before the socket is lowered into the tubing for retrieving the anchoring device therefrom.

When the pulling socket 50, suspended to a wire line, reaches the anchoring tool, the pulling tube 53 enters the bore 31 of the anchoring device, and by slight jarring action (with conventional jars, such as that shown in United States Letters Patent No. 1,898,261 issued on February 21, 1933, attached to the wire line), the pulling tube 53 is moved downwardly through the bore 31 until the pulling tube 53 engages the ends 40 of the latching lugs 38 and pushes them outwardly about the pivot pins 37, and against spring 44, until the upper ends 39 of the latching lugs 38 are free of the recess 15. Further jarring action causes the prongs 51 of the retrieving socket 50 to pass over the head 30 and the heads 52 on the prongs 51 engage the head 30 to permit the anchoring device to be pulled from the tubing. The pulling tube 53 holds the latching lugs 38 in unlatched position, as shown in Fig. II, while the anchoring device, and the subsurface flow control device attached thereto, are being retrieved from the tubing on the wire line.

In Fig. III a modified form of the anchoring device is shown, wherein the only difference between such anchoring device and that shown in Figs. I, II and IV is that the stop shoulder 20 has been eliminated from such modified form, and a stop sub 56 has been threadedly engaged with the lower end of the anchoring device by means of companion threads, indicated at 57.

The stop sub 56 has a beveled, outer, annular shoulder 58 thereon which is engageable with a companion shoulder 59 provided in the lower end of the seating nipple 11.

A subsurface flow control device 24 is threadedly engaged with the stop sub 56 by companion threads 60.

The anchoring device shown in Fig. III is run, set and retrieved in the same manner as was described above with reference to the form shown in Figs. I, II and IV, the only difference being that the anchoring device is stopped against downward movement by the engagement of the shoulders 58 and 59 at the lower end of the anchoring device instead of by engagement between the shoulders 20 and 21, at the upper end of the device, as was the case in Figs. I, II and IV.

In some operations it may be necessary to provide the stop for the anchoring device at the lower end thereof instead of at the upper end. For such purpose the modification of Fig. III is provided.

It will be understood, however, that the anchoring device could be stopped against downward movement at any place in the tubing string by engagement with a shoulder arranged at any place about the body 17 or on any tool carried thereby, with a suitable stop shoulder provided in the tubing string.

It will also be apparent that the latching lugs 38 do not necessarily have to be engaged in a recess provided inside a standard coupling 12, as shown herein, but the latching lugs could be engaged with a recess provided as a part of a landing nipple in which it is inserted, and at any place along the tubing string desired.

In Figs. V and VI is shown another modified form of anchoring device wherein two pairs of oppositely disposed latching lugs 72 and 85 are provided in connection therewith for removably locking the anchoring device, and subsurface flow control tools carried thereby, against either upward or downward movement in the tubing string.

Such modified anchoring device includes a tubular body 64, similar in construction and contour to the body 17, in the heretofore described forms of anchoring devices. The body 64 has a central bore 63 extending therethrough, and includes an enlarged cylindrical mid-section 65, having a shoulder 66 at the upper end thereof.

A pair of diametrically opposed elongated slots 67 are provided in the outer face of the enlarged cylindrical mid-portion 65. The slots 67 are only partially cut through at the upper ends thereof, leaving a thin wall 68 in each of said slots at the upper end thereof.

The slots 67 are cut entirely through the wall of the body 64 substantially mid-way of the length thereof to form oppositely disposed elongated passages 69 in which the lower ends of the latching lugs 72 may pass.

At the lower end of each of the slots 67 is provided a flow port 71, extending through the wall of the body 64, each of said flow ports 71 causing communication between a slot 67 and the bore 63 of the anchoring device. The flow ports 71 are spaced from the passages 69, leaving webs 70, against which the fingers 76 on the lower ends of the latching lugs 72 are engageable, to limit the inward movement of the lower ends of the latching lugs.

The latching lugs 72 are pivotally mounted in the slots 67 by means of pivot pins 73 which pass through the latching lugs 72, and are engaged with the opposite walls of the slots 67. The springs 77 are engaged between the upper ends 74 of latching lugs 72 and the thin wall sections 68. The springs 77 are arranged to normally urge the ends 74 outwardly, and when so urged outwardly into engagement with the recess 15, a portion of the lower ends 75 of the latching lugs 72 extend through the passages 69 into the bore 63 of the anchoring device.

Another pair of pivoted latching lugs 85 are provided in connection with the anchoring device shown in Figs. V and VI. The lugs 85 are in vertical and circumferential spaced relation to the latching lugs 72.

A pair of oppositely disposed elongated slots 80 are provided in the wall of the enlarged mid-section 65 of the body 64. The slots 80 are spaced 180 degrees apart and are each spaced 90 degrees from the slots 67. The slots 80 are formed exactly in the same manner as the slots 67. Each slot 80 is partially cut through at the upper end thereof, leaving a thin wall portion 81 at the upper end of each slot 80. At substantially the mid-portion of the length of each slot 80 there is cut through the wall of the body 64 an elongated passage 82, through which the upper end of the latching lugs 85 may pass, and extend into the bore 63 of the body 64.

A flow passage 84 is cut entirely through the wall of the body 64 at the lower end of each of the slots 80, which leaves thin wall portions or webs 83 between the flow passages 84 and the passages 82.

A latching lug 85 is pivotally mounted in each of the slots 80 by means of pivot pins 86, which pass through the latching lugs 85 and are secured to the opposite walls of the slots 80.

The latching lugs 85 are reversed in direction, from the latching lugs 72.

The lower ends 87 of the latching lugs 85 are arranged to be normally urged outwardly by springs 88 engaged between said ends 87 and the webs 83. The heads 89

of the latching lugs 85, are uppermost, and each head 89 has a finger 90 extending therefrom. The fingers 90 are engageable with the thin wall portions 81 to limit the inward movement of the heads 89 when moved inwardly by action of the springs 88.

A portion of each of the heads 89 is arranged to extend inwardly of the bore 63 of the anchoring device, through the passages 82, when the springs 88 are in relaxed condition, and the lower ends 87 of the latching lugs 85 are moved outwardly into engagement with the recess 15.

The upper set of latching lugs 85 are shown in retracted position in Fig. VI, being held in retracted position by the running tube 96 for the purpose which will be explained in connection with the operation of this modification.

An annular chamfered surface 93 is provided at the lower end of the seating nipple 11 for the purpose which will be explained.

A coupling 94 is threadedly engaged with the seating nipple 11 by means of companion threads 95, which coupling 94 may be employed to join the seating nipple 11 with a section of tubing therebelow, or with a flow directing nipple, used in connection with a flow control device.

The modified form of anchoring device shown in Figs. V and VI may be run, set and retrieved in the manner hereinafter described.

A running tube 96, of sufficient length to retract the upper set of latching lugs 85, but not of sufficient length to retract the lower set of latching lugs 72, is threadedly engaged with a running tool 46 by means of companion threads 97.

The running tool 46 is attached to a conventional wire line and the integral skirt 47 on the running tool 46 is passed over the head 30 on the fishing neck 29, and is attached thereto by means of shear pins 48, which pass laterally through the wall of the skirt 47 and underneath the annular shoulder 45 of the head 30, at opposite sides thereof.

The anchoring device is thus suspended to the wire line, with the upper pair of latching lugs 85 held in retracted position by the tube 96, as shown in Fig. VI.

The tool is then lowered into the well on the wire line, carrying below it a suitable sub-surface flow control device.

The fact that the lower pair of latching lugs 72 are not in retracted condition while the tool is being lowered in the tubing is of no consequence, because the upper ends 74 of the latching lugs 72 are pressed inwardly as they slide downwardly along the inner side of the tubing and past any recesses in the tubing string. The latching lugs 72 engage only to prevent upward movement of the anchoring device, and the anchoring device is permitted to move downwardly, even though the lower set of lugs 72 are not held in retracted condition.

When the anchoring device reaches a seating nipple, such as 11, in the tubing string, the tightness of the frictional engagement of the packing 26 with the walls of the seating nipple causes the anchoring device to stop. The operator then knows that the locking device has reached the nipple. Light jarring action by manipulation of the wire line will move the anchoring device through the nipple, and after passing through the nipple, the anchoring device will again normally move downward to another nipple by its own weight.

The anchoring device may be passed through as many seating nipples as desired, until the selected place for setting the subsurface flow control device is reached.

Thus, a flow control device, carried by the modified anchoring device, shown in Figs. V and VI, may be selectively set at various elevations where seating nipples 11 may be incorporated in the tubing string.

When the modified anchoring device reaches the nipple where it is desired to set the flow control device, the anchoring device is forced through the nipple by jarring action, as above described. The operator then jars upwardly on the wire line, and moves the anchoring device upwardly through the nipple. As it moves upwardly, the lower set of latching lugs 72 are retracted by engagement of the upper ends 74 thereof with the chamfer 93 at the lower end of the seating nipple 11. When the lower set of latching lugs 72 have been raised above the top of the seating nipple 11, the upper ends 74 thereof expand into the locking recess 15 and engage the lower end of the tubing section 10, stopping any further upward movement.

Continued upward jarring action, by manipulation of the wire line, shears the shear pins 48, releasing the skirt 47 from engagement with the head 30, permitting the running tool 46 to be drawn upwardly, carrying with it the running tube 96, and removing the running tube from the bore 63 of the anchoring device. Thus the upper set of latching lugs 85 are allowed to relax, permitting the lower ends 87 thereof to enter the recess 15, and locking the anchoring device against downward movement in the tubing string.

The modified locking device, shown in Figs. V and VI, is thus latched in placed in the tubing string against upward or downward movement and in position to pack-off against the flow of fluid thereabout, as shown in Fig. V.

It will be noted that when the modified anchoring device is thus latched in place, a portion of the fluid flowing upwardly through the bore 63 may flow through the side ports 71 and 84 and passages 69 and 82, about the body 64 and fishing neck 29, to thereby flush away sand and sediment, and prevent it from settling about the locking lugs and the fishing neck.

To remove the locking device, shown in Figs. V and VI, from the tubing, a conventional overshot type of retrieving head, such as indicated at 50, is attached to a wire line and run into the tubing. The retrieving tool 50 has a pulling tube, such as 53, attached thereto of sufficient length to extend into the bore 63 of the modified anchoring device to sufficient extent to engage and retract the upper set of latching lugs 85 and the lower set of latching lugs 72, by pushing the ends 75 and 89 out of the bore 63 against the springs 77 and 88, thus freeing the ends 74 and 87 from the recess 15.

The pulling tube is caused to enter the bore 63 and retract the lugs 85 and 72 in the manner described, and by downward jarring action on the wire line, the prongs 51 may be sprung over, and engaged with, the head 30.

The anchoring device may then be jarred upwardly by manipulation of the wire line to disengage the anchoring device from the seating nipple 11, and permit it to be withdrawn through the well tubing.

In use the modified form of anchoring device, shown in Figs. V and VI, may be passed downwardly through as many seating nipples as may be desired in reaching a selected nipple where the subsurface flow control device, carried by the anchoring device, is to be set.

In all of the forms of the anchoring device, shown and described herein, the latching lugs are pivoted to the wall of the main body of the anchoring device and no carriers or other mounting elements are placed about the body of the anchoring device to support the latching lugs. There is no separate mandrel, or other member, incorporated in the tool for relative sliding movement to move the locking lugs into locked position with the tubing. There is thus a minimum amount of obstruction to flow of fluid through the anchoring device.

Provision is made for flowing a portion of the fluid, passing upwardly through the bore of each of the forms of anchoring device, through side ports in the wall thereof, and about the latching lugs and the fishing neck thereon, to prevent sand and other undesirable sediment from collecting about the tool, to thereby permit ease in operation and removal.

It will be apparent that other and further forms of my invention may be devised and made without departing from the spirit and scope of the appended claims.

I claim:

1. In an anchoring device, a hollow cylindrical body; a longitudinal bore extending through the body; a plurality of elongated slots provided in the outer wall of the body; a passage extending through the wall of the body in each slot; a relatively thin wall portion at the upper end of each slot; a latching lug pivotally carried in each slot; spring means positioned between one end of each lug and the thin wall portion in the slot, said spring means being arranged to normally urge said end outwardly beyond said slot; the other end of each lug being arranged to project through a passage into the bore of the body when the first named end is urged outwardly beyond the slot by the spring; a flow port extending through the wall of the body at the lower end of each slot, said flow port being spaced from the passage by a web portion; each lug having an extension thereon engageable with a web portion to limit the pivotal movement of the lugs in response to spring action.

2. In an anchoring device, a hollow body; a longitudinal bore extending through the body; a plurality of circumferentially spaced passages extending through the wall of the body, communicating with the bore; a plurality of spring latches pivotally carried by the body; each such spring latch having a part normally extending outwardly of the body and a part normally extending through one of the passages into the bore of the body when the latch is in normal condition; and an annular stop shoulder arranged about the hollow body intermediate the ends thereof, said stop shoulder being engageable with a complementary stop shoulder inside a tubing string to limit downward movement of the body in a tubing string.

3. In an anchoring device for anchoring flow control equipment in a string of well tubing, a seating nipple; a coupling joining the seating nipple and the tubing string thereabove; a recess provided in the coupling between the tubing string and the upper end of the seating nipple; a hollow body; a longitudinal bore extending through the body; a plurality of circumferentially spaced passages extending through the wall of the body, communicating with the bore; a plurality of spring latches pivotally carried by the body; each such spring latch having a part normally extending outwardly of the body and a part normally extending through one of the pasages into the bore of the body when the latch is in normal condition; packing means carried about the lower end of the body and arranged to be inserted in the seating nipple and to seal against the inner wall thereof; an annular stop shoulder arranged about the body intermediate the ends thereof engageable with the upper end of the nipple; the spring latches being arranged to enter the recess when the shoulder is engaged with the upper end of the seating nipple and the packing means is positioned in the seating nipple.

4. In an anchoring device, a hollow cylindrical body; a longitudinal bore extending through the body; a pair of diametrically opposed passages extending through the wall of the body; a pair of spring latches pivotally attached in the said passages; the latches having an end extendable into the bore of the body and the other end being extendable outwardly of the body; another pair of diametrically opposed passages in the wall of the body and being diametrically spaced from the first named pair of passages; a pair of spring latches pivotally attached in the last named pair of passages, the said last named pair of latches having an end extendable into the bore of the body and the other end being extendable outwardly of the body; the outwardly extendable ends on the separate pairs of latches being longitudinally spaced on the body and facing in opposite directions, whereby they may engage the upper and lower ends of a tubing recess to limit upward and downward movement of the body.

5. Claim 4 with the addition of means attached to the upper end of the body and having a part extendable into the body to engage and hold one pair of latches in retracted position while the body is being lowered into a well tubing.

6. The combination called for in claim 4 with the addition of a resilient packing element about the body below the latches.

7. The combination called for in claim 4 wherein each latch has a portion on the inwardly extendable end thereof engageable with the wall of the body to limit the inward movement of the inwardly extendable end.

8. The combination called for in claim 4 with the addition of a flow port through the wall of the body below each of the latches.

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