Feb. 7, 1967 M. H. MADELEY, SR 3,302,722

WIRE LINE RETRIEVABLE WASH PIPE BOTTOM HOLE ASSEMBLY

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Fig. 1

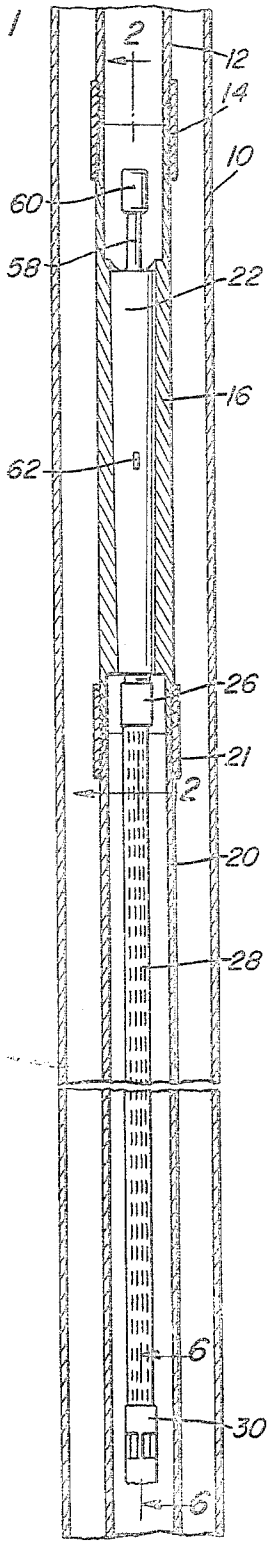


Fig. 6

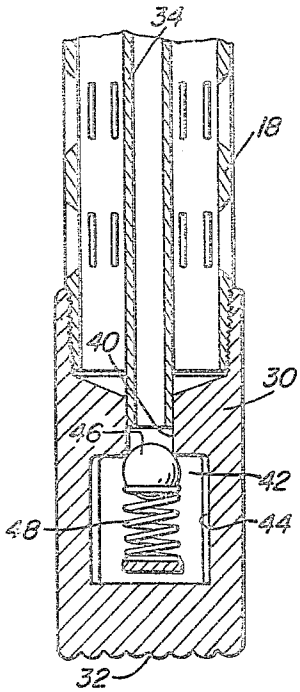


Fig. 5

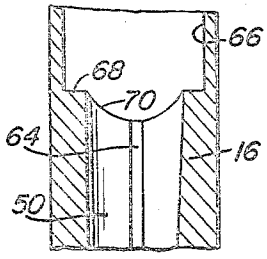
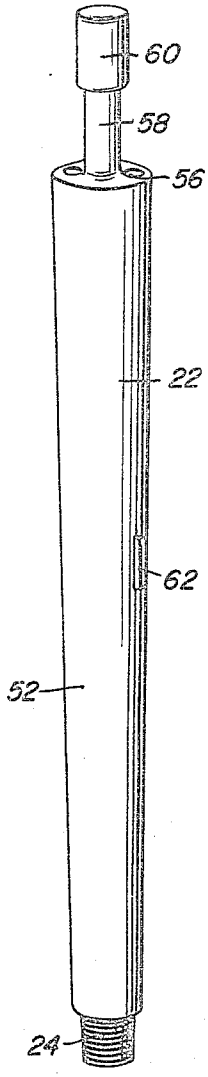


Fig. 7



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WIRE LINE RETRIEVABLE WASH PIPE BOTTOM HOLE ASSEMBLY

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Fig. 2

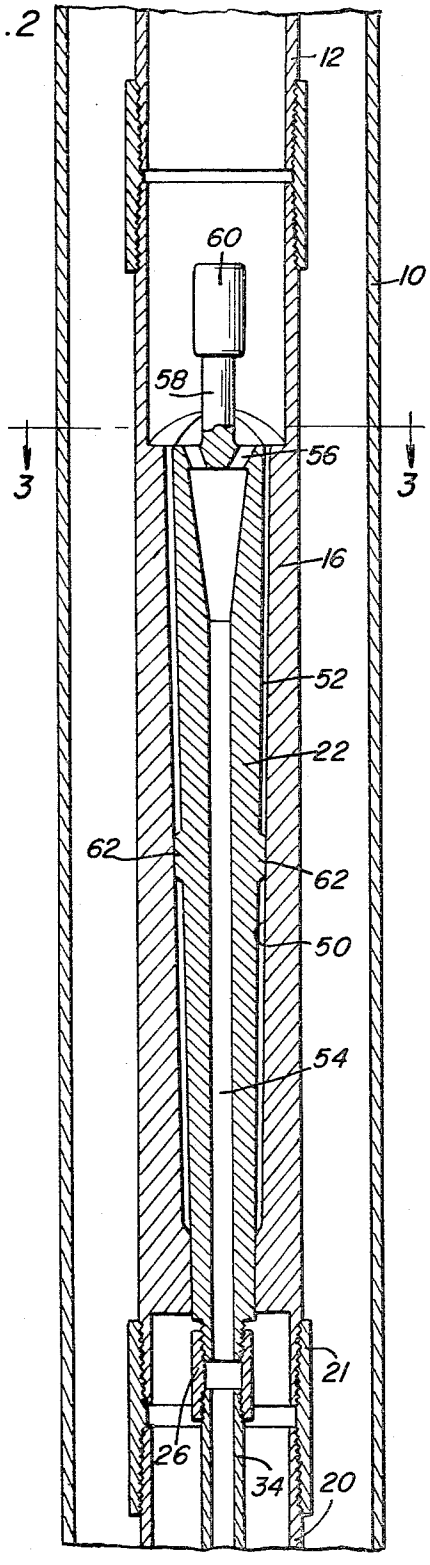
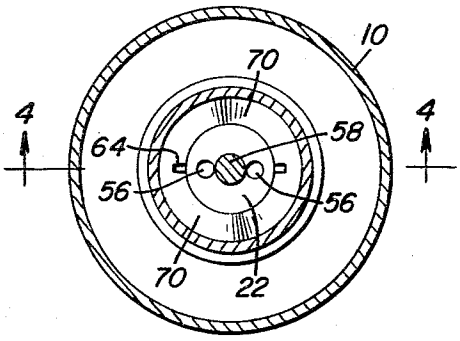


Fig. 3



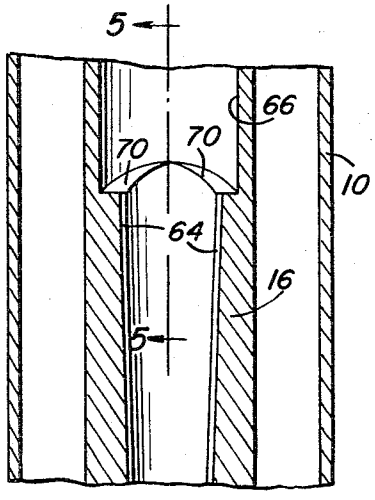


Fig. 4

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3,302,722

WIRE LINE RETRIEVABLE WASH PIPE BOTTOM HOLE ASSEMBLY

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1 Claim. (Cl. 166—157)

This invention comprises a novel and useful wire line retrievable wash-over bottom hole assembly and more generally pertains to a bottom hole assembly which is retrievable as by a wire line or a tool string through a tubing or pipeline without disturbing the latter.

It is often desirable in the performing of many different operations in connection with the drilling or servicing of wells, to introduce a pipe, implement or tool into a tubing, tool or work string in a well bore and to retrieve the introduced pipe or other element from the tubing string or pipe string after completion of the desired operations. The present invention deals with an apparatus and a method in accordance with the above operations. For convenience of description only, the string into which the retrievable assembly is introduced and is retrieved is referred to hereinafter as a tubing or pipe string although it will be appreciated that it may be either a well tubing string, a drilling string or work line or the like while the retrievable assembly may be referred to as a wash pipe assembly although it may equally consist of other specialized tools such as a drill, an injector of various chemicals and materials into a well bore and for other purposes.

Heretofore the acts of introducing and removing or retrieving the wash pipe are frequently attended by undesirable conditions such as the necessity for running the entire tubing or pipe string into or out of the well in order to insert or retrieve the wash pipe assembly. This practice usually requires considerable time to perform and is expensive and sometimes is accompanied by danger to the well bore. Moreover, in some instances packers are employed which must be detached and replaced each time the tubing string is run. Further, it often occurs that for various reasons there is insufficient clearance available in the well bore outside of the tubing or pipe string to effect the passage of the wash pipe therebetween to the desired location in the well bore.

It is therefore the primary object of this invention to provide a method and a means by which a wash pipe may be inserted into or retrieved from a tubing, tool string or the like, while the latter is in position in the well bore and without the necessity for disturbing the tubing or pipe string during the insertion or retrieving operation.

It is the fundamental purpose of this invention to largely overcome the above difficulties by inserting and seating a wash pipe in a tubing or tool string in such a manner that it may be quickly and easily inserted and retrieved as by a wire line or by engagement with a work string or the like without necessitating any movement of the tubing or pipe string in which the assembly is disposed.

A further object of the invention is to provide a means and a method for removably and retrievably seating a wash pipe or other member in the interior of the lower end of a tubing or work string whereby the pipe or other member may be readily introduced into or removed from the string without disturbing the latter and whereby the inserted assembly may be secured to the pipe string in order to effect rotation therewith.

Still another and more specific purpose of the invention is to provide an anchor or holddown unit for a wash pipe or other member in a seating nipple of a tubing or other string which will facilitate the locking

of the former in the latter against relative rotation while permitting axial movement relative thereto.

A still further important object of the invention is to provide in a device of the character above set forth a bottom hole assembly including a non-return check valve which will permit the discharge of fluids from the retrievable assembly into the well bore but will prevent return flow therefrom and wherein the bottom hole assembly shall have a telescoping sliding fit with the retrievable assembly.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a fragmentary view in vertical central section through a portion of a well casing and a tubing or other string therein and showing the retrievable holddown and attached pipe forming the retrievable assembly of this invention seated therein;

FIGURE 2 is an enlarged view of the upper portion of the device of FIGURE 1, being taken substantially upon the vertical plane indicated by the section line 2—2 of FIGURE 1;

FIGURE 3 is a horizontal sectional view taken substantially upon the plane indicated by the section line 3—3 of FIGURE 2;

FIGURE 4 is a further detail view in vertical section taken substantially upon the plane indicated by the section line 4—4 of FIGURE 3 and showing the internal structure and configuration of the seating nipple, with the holddown unit being removed therefrom;

FIGURE 5 is a detail view taken substantially upon the plane indicated by the section line 5—5 of FIGURE 4;

FIGURE 6 is an enlarged view in vertical section of the lower portion of the retrievable element and the bottom hole assembly connected thereto, being taken substantially upon the plane indicated by the section line 6—6 of FIGURE 1 and on an enlarged scale; and,

FIGURE 7 is a perspective view of the holddown component of the retrievable assembly.

In the accompanying drawings, the numeral 10 designates the casing of a well bore of any desired type while the numeral 12 indicates the lower portion of a pipe string which may constitute a flow tubing for producing the well, a work string for drilling or other working operations or a pipe string for treating the well in various manners. In accordance with this invention at the lower portion of the string 12 there is detachably secured as by a coupling sleeve 14 a seating nipple 16. The lower end of the seating nipple may be open or may have various other elements or units attached thereto, as for example, the bottom tubing section 20 which may be detachably secured as by the coupling 21 and having a screen or strainer portion 18 at its lower end, see FIGURE 6. The retrievable assembly consists of a hollow body 22 constituting a holddown and which has its lower end threaded as at 24 to receive thereon as by a coupling sleeve 26 any suitable and replaceable element such as 28 (see FIGURE 1) which is thus dependingly supported by the holddown unit or body 22. Secured to the lower strainer end 18 of the lower tubing section 20 is a bottom hole valve assembly 30 comprising a hollow body secured to the end 18 by screw threads as shown in FIGURE 6 and which may be provided with drill teeth or work shoe at 32 on its bottom surface for drilling or milling operations as may be desired.

In lieu of the strainer sleeve 28 there may be applied as shown in FIGURES 2 and 6 a wash pipe 34 of conventional character and purpose.

It will thus be seen that the retrievable assembly will consist of the two detachably connected components comprising the holddown device or body **22** and a depending tool or element which may selectively comprise a strainer sleeve **28** and a wash pipe having its lower end slidably and snugly received in a bore as at **40** disposed in the valve body of assembly **30**, this bore opening into a valve chamber **42** having ports **44** opening through the side thereof into the well casing **10**. A non-return check valve **46** is yieldingly urged as by a valve spring **48** against the open lower end of the bore **40** which thus constitutes a valve seat for the bottom hole assembly.

The purpose of this valve asembly is to prevent the inflow of fluid when the device is being lowered into a well bore and which fluid might thus introduce sand or particles between the valve and its seat, while permitting ready downflow of fluid through the retrievable assembly.

Referring again to FIGURE 2 it will be seen that the nipple **16** has a conical internal seating surface or seat **50** which cooperates with a correspondingly tapered conical exterior seating surface **52** provided upon the body **22**. The body **22** is provided with an axial bore or passage **54** therethrough which, as shown in FIGURE 2, is in continuous communication with the upper end of the member **34**, this passage at its upper end having ports as at **56** which communicate with the interior of the pipe string **12** with which the nipple **16** is associated. Thus; the weight of the retrievable assembly including the body and its depending member **34** is held by gravity in a secure seating engagement and holding engagement upon the conical surface **50** of the nipple **16**.

At its upper end the body is provided with a diametrically reduced neck **58** having an enlarged head **60** thereon for engagement by a conventional wire line grapple to thus permit ready retrieving of the retrievable assembly or its introduction into the tubing string or pipeline **12**.

Alternatively, the headed member **60** may be replaced with a threaded connection whereby a work string or the like may be introduced into the upper end of the string **12** and engaged and connected to the retrievable assembly to withdraw the latter.

With more particular reference to FIGURES 3, 4 and 5 in conjunction with FIGURES 2 and 7 it will be observed that the body or holddown **22** is provided with lateral projections, lugs or keys **62** at suitable positions along its exterior surface and which cooperate with the vertically extending keyways or grooves **64** in the surface **50** of the nipple **16**. Consequently, when the holddown or body **22** is seated in the nipple, the keys or projections **62** will be received in the grooves **64** thus providing a locking means which will permit sliding movement between the holddown body and the nipple but will prevent relative rotation therebetween. Consequently, with the retrievable assembly seated as shown in FIGURE 2, rotation of the tubing or pipe string **12** by the usual mechanism at the surface will in turn impart rotation to the retrievable assembly thereby enabling the latter to be rotated and with it the tools or elements secured to the lower end thereof.

In order to facilitate and ensure the engagement of the locking keys **62** with the grooves **64**, the open upper end of the bore or axial passage in the seating nipple **16**, which is upwardly divergent, is provided with a counterbore or enlarged chamber as at **66** thus providing an

annular shoulder **68** at the junction of the lower end of this chamber with the seating surface **50**. This shoulder is provided with downwardly directed recesses as at **70** which converge toward and constitute guides for the grooves **64**, these guide surfaces as suggested in FIGURES 4 and 3, having their lower portions merging into the grooves **64**. Thus the weight of the retrievable assembly will by virtue of the camming surfaces **70** direct the locking keys **62** into engagement with the locking grooves **64**.

In some instances, it may be desired to omit the sleeve **28** secured to the holddown body **22** and directly connect the wash pipe **34** thereto as suggested in FIGURE 2, either with or without the bottom hole assembly **30** connected to the end of the wash pipe. In other instances, other tools or implements for various purposes may be connected to the holddown assembly body **22**.

It will thus be apparent the device lends itself to a wide variety of uses in conjunction with the use of various equipment and for performing various operations and functions in connection with a well bore.

The essence and the fundamental principle of this invention resides in the concept of introducing and retrieving an assembly for bottom hole operation through a tubing string, a pipeline, a work line or the like without disturbing the position of the latter in a well bore.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

A wash device for a well bore having a pipe string therein comprising a seating nipple constituting a component of said pipe string having an internal seat, a wash pipe assembly insertable into and retrievable through said pipe string and nipple, said wash pipe assembly including a body having a seating surface engageable with said seating nipple, a wash pipe member depending from said body, said body and wash pipe member having a continuous fluid passage disposed therethrough, a downwardly discharging and non-return foot valve assembly on the string surrounding a lower end of said wash pipe member preventing fluid flow upwardly into said fluid passage and a locking device comprising cooperating, longitudinally extending key and groove on the seating surfaces of said body and nipple preventing relative rotation therebetween, said seating surfaces forming cam surfaces directing said key into said groove upon axial movement of said body and nipple toward each other.

References Cited by the Examiner

UNITED STATES PATENTS

2,782,860	2/1957	Tausch et al.	166—44
2,905,249	9/1959	Ownbey	166—157
2,990,017	6/1961	Powers	166—57
3,020,955	2/1962	Tausch	166—44

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