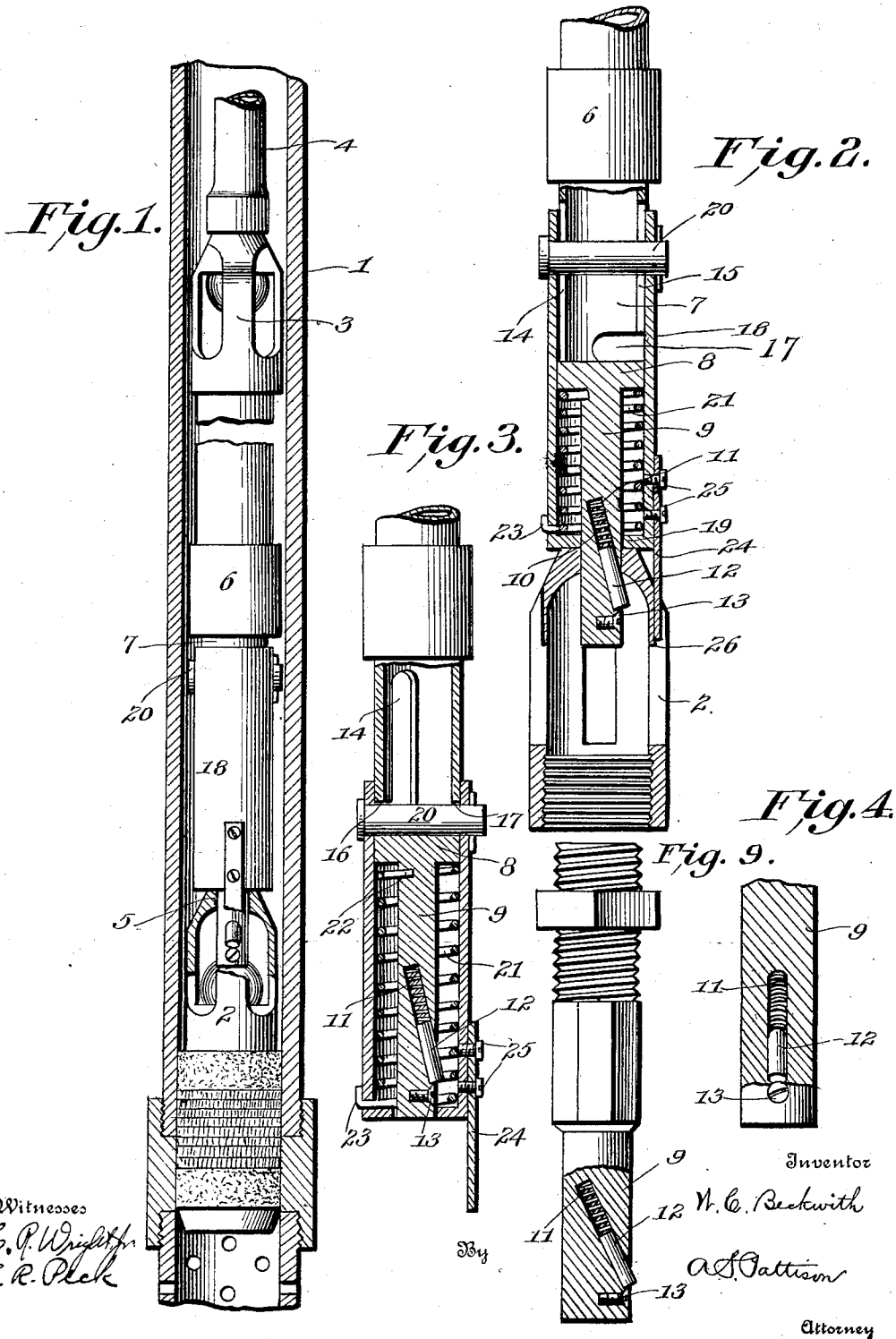


902,468.

Patented Oct. 27, 1908.

2 SHEETS—SHEET 1.



W. C. BECKWITH.
SPEAR FOR OIL WELLS.
APPLICATION FILED APR. 18, 1907.

902,468.

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2 SHEETS—SHEET 2.

Fig. 5.

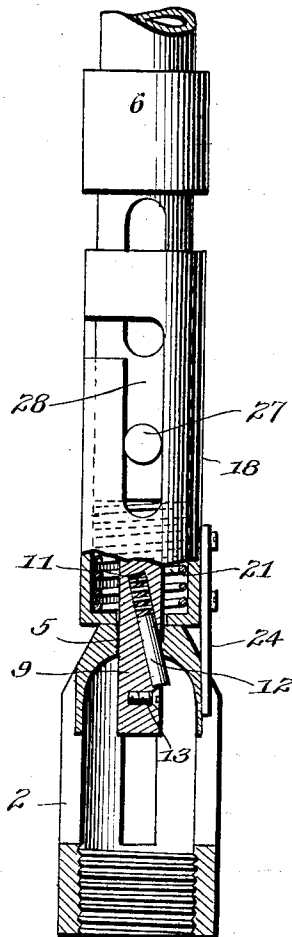


Fig. 6.

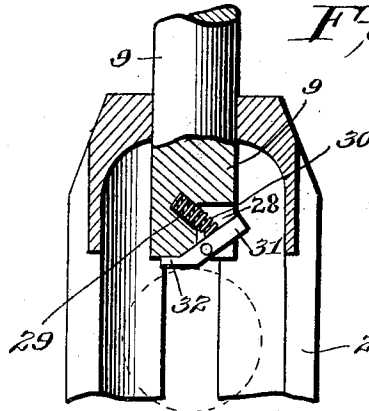


Fig. 7.

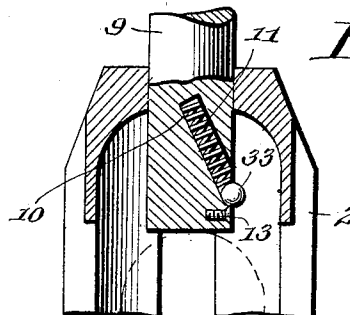
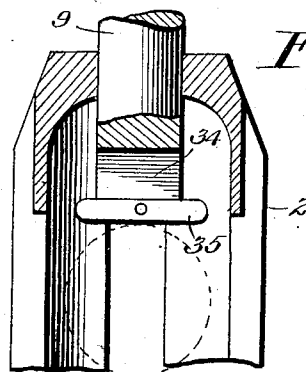


Fig. 8.



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UNITED STATES PATENT OFFICE.

WALTER C. BECKWITH, OF FOSTORIA, OHIO.

SPEAR FOR OIL-WELLS.

No. 902,468.

Specification of Letters Patent.

Patented Oct. 27, 1908.

Application filed April 18, 1907. Serial No. 368,954.

To all whom it may concern:

Be it known that I, WALTER C. BECKWITH, a citizen of the United States, residing at Fostoria, in the county of Seneca and State of Ohio, have invented certain new and useful Improvements in Spears for Oil-Wells, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in spears for oil wells.

The object of my invention is to provide a spear of this character which can be readily attached to the lower end of the piston valve, whereby the standing valve may be readily coupled to the piston valve, and the same removed together at the will of the operator.

Another object of my invention is to provide a spear of this character which can be readily used as a jar for the valve, without coupling the same together, and therefore the accidental dropping of the piston valve caused by the uncoupling of the sucker rod will not couple the two valves together.

A still further object of my invention is to provide a more simple, cheap and effective spear of the character described.

In the accompanying drawings, Figure 1, is a vertical sectional view of an oil well casing showing the piston valve coupled to the standing valve for removing the same. Fig. 2, is a vertical sectional view of the spear coupled to the standing valve. Fig. 3, is a vertical sectional view of the spear in its set position. Fig. 4, is an enlarged sectional view of the locking means. Fig. 5, is a side elevation partly in section, of a modification of the sliding sleeve and its locking means. Fig. 6, is a sectional view of a modified form of locking means. Fig. 7, is a sectional view of another modified form of locking means. Fig. 8, is a sectional view of a still further modified form of locking means. Fig. 9, is an enlarged side elevation partly in section of the locking means.

Referring now to the drawings, 1 represents the casing of an oil well which is of any well known structure, as is well understood by those skilled in the art. Within said casing at the bottom is the standing valve 2 which is of the usual structure, and a distance thereabove is the piston valve 3 which is operated up and down through the medium of the sucker rod 4, and by the arrangement of the two valves the oil is

pumped upwardly through the casing to the top of the well. In devices of this character it is well understood that the standing valve is frictionally held within the casing independent of the piston valve, and in order to remove the same in case it gets out of order, it has heretofore been necessary to withdraw the piston valve, uncouple each section of the sucker rod 4 as it is being removed, and after the piston valve has reached the top of the casing the piston valve is removed and a coupling is placed on the sucker rod and it is then replaced within the casing and section after section coupled together until the coupling is lowered to the standing valve 2. The standing valve is provided with a screw-threaded opening 5 into which the coupling is screwed, and in coupling the same together it is often a difficult task, as the standing valve will often turn and thus prevent the coupling of the two together. The threads of the opening in the standing valve also become worn and the removal of the standing valve sometimes becomes impossible. In such cases the whole tubing 1 has to be removed, bringing with it the standing valve.

My invention is designed to be attached to the lower end of the piston valve, and so constructed and arranged that it can be used as a jar to loosen the paraffin from the balls, and at the same time preventing the coupling of the two valves together.

My device is also constructed and arranged so that the accidental dropping of the piston valve upon the standing valve will not couple the same together, as this often occurs, and it is my object to obviate these difficulties which are found in devices of the character now in use.

The lower end of the piston valve 3 is provided with a screw-threaded portion upon which is screwed the upper socket member 6 of my improved spear. The said socket having the downwardly-extending hollow portion 7 which communicates with the hollow sucker rod 4, as will be hereinafter more fully described. The lower end of said hollow member is closed at 8 and is provided with the downwardly-extending reduced solid portion 9 which is adapted to enter the opening 5 in the standing valve. The said reduced solid portion 9 is provided with an obliquely-arranged annular recess 10 commencing adjacent its lower end, and extending upwardly. Within said recess is a coiled spring

11, and also within the said opening is a plunger 12 which is normally held in its outward position, one side of said plunger extending considerably beyond the outer face of the reduced portion 9. Within the lower end of said recess is a screw 13, the head of which is engaged by the plunger, whereby the plunger is prevented from passing entirely out of the spear.

In the use of the word spear throughout the specification I mean broadly a means for coupling the pump valve and standing valve together, and not any specific part thereof.

The hollow portion 7 on opposite sides is provided with vertically-disposed slots 14 and 15 having at their lower ends the laterally-extending slots 16 and 17, all of which forms two oppositely-arranged bayonet slots. Surrounding the said hollow portion 7 is a sleeve 18 which has its lower end contracted at 19 to fit the solid portion 9, and the sleeve being vertically adjustable thereon. The upper end of the sleeve carries a transverse key or bolt which passes through the slots 14 and 15, and is vertically-movable therein. Within the said sleeve below the solid portion 8 and surrounding the solid portion 9, is a coiled spring 21 which has its upper end attached to the solid portion 9, as indicated at 22, while the lower end of the spring is connected to the sleeve 18, as indicated at 23. The coil spring 21 exerts a downward pressure on the sleeve, holding the sleeve in its extended position, and the spring also exerts or tends to rotate the sleeve and holds the sleeve in a position with the bolt in the laterally-extending portion of the slot, and therefore prevents the upward movement of the sleeve.

The sleeve at one side is provided with a downwardly-extending arm 24 which is fastened thereto by means of screws 25, the purpose of which will be hereinafter more fully described.

The piston valve and standing valve being in their relative working position, should either valve become clogged with paraffin, the piston valve is lowered upon the upper end of the standing valve and serves as a jar to jar the paraffin away from the valve. Should either valve become disarranged it will be only necessary to drop the piston valve upon the standing valve. The arm 24 enters one of the recesses or cut away portions 26 of the standing valve, and by a slight oscillating movement of the sucker rod to the left, the spear is turned in the sleeve, the sleeve being held against rotation on the standing valve. When the sucker rod has been turned sufficiently to bring the pin 20 opposite the lower end of the vertical slot, the weight of the sucker rod will force the spear through the opening in the standing valve, and after the same has passed therein the spring-pressed plunger is forced outwardly. The upward

movement of the sucker rod causes the spear to rise in the opening in the standing valve until the said opening engages the plunger, and tends to force the same outwardly, thus locking the two valves together against any possible liability of them being disconnected. By this construction it will be seen that the two valves may at will be connected together, and both raised from the well, thus saving considerable time over the method now used in removing the standing valve.

In Fig. 5, the spear is provided with the transverse pin 27, and the sleeve is provided with the two bayonet slots 28', whereby the sleeve and spear are locked together in the same manner as that shown in the other figures.

In Fig. 6, instead of having the form of lock heretofore described, the lower end of the spear 9 is provided with a cut-away portion 28 which is provided with a recess 29 in which is mounted a coil spring 30, and pivoted within said cut-away portion is a member 31, the upper end of which is engaged by the spring, and normally held in the outward position. The lower end of said pivoted member is provided with a laterally-extending portion 32 which engages the lower end of the spear, and limits the movement of the pivoted member. This allows the spear to readily pass through the opening in the standing valve, but prevents its withdrawal from the opening.

Fig. 7 shows balls 33 working on the same principle as the plunger 12.

Fig. 8 shows the lower end of the spear 9 cut away as shown at 34, and pivoted therein is the member 35 which is normally held in a vertical position by the sleeve 18, and is forced in as shown in said figure, by the engagement thereof with the ball valve.

In Fig. 9 I have shown a device embodying my invention, in which the sleeve 18 is omitted, and in such a form the two valves are coupled together simply by the lowering of the piston valve on the standing valve.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:—

1. The combination with a well casing, a standing valve therein, a pump valve working above the standing valve, a spear carried by the lower end of the pump valve, a sleeve slidably surrounding said spear, means for normally holding the sleeve in its downward position, and means for locking the sleeve in its downward position.

2. The combination with a well casing, a standing valve therein, a pump valve working above the standing valve, a spear carried by the lower end of the pump valve, a sleeve slidably surrounding said spear, and means for locking the sleeve in its downward position.

3. The combination with a well casing, a

standing valve therein, a piston valve working above the standing valve, a spear carried by the lower end of the piston valve, and an obliquely arranged spring-pressed member within the lower end of the spear for locking the same to the standing valve.

4. The combination with a well casing, a standing valve therein, a piston valve within the casing above the standing valve, a spear carried by the lower end of said piston valve, an obliquely arranged spring pressed member within the lower end of the spear for locking the same to the standing valve, a sleeve surrounding the spear and slidable thereon, and means for normally holding said sleeve in its downward position inclosing the spring-pressed member.

5. A device of the character described, comprising a spear, a downwardly and outwardly spring-pressed member therein, a sleeve slidably surrounding the spring-pressed member, and means for locking said sleeve in its downward position.

6. The combination with a well casing, a standing valve therein, a piston valve above the standing valve, a spear carried by the lower end of the piston valve, a downwardly and outwardly spring-pressed member therein and extending through the side of the spear, a sleeve slidably mounted upon the spear, a spring for normally holding the sleeve in its downward position surrounding the spring-pressed member, means for locking the sleeve in its downward position, and means carried by the sleeve for engaging with the standing valve for releasing the sleeve.

7. A device of the character described, comprising an enlarged cylindrical member having an oblique upwardly-extending recess extending from one wall thereof, a spring within said recess, a plunger within the recess and bearing against the spring, and a screw extending laterally into the cylindrical member, and the head thereof partially closing the lower end of said recess.

8. A device of the character described, comprising an elongated cylindrical member, an oblique upwardly-extending recess extending from one wall thereof, a spring within said recess, a plunger within the recess and bearing against the spring, a screw extending transversely into the cylindrical member and the head thereof partially closing the lower end of said recess, and a sleeve slidably mounted on said spear.

9. A device of the character described, comprising an elongated cylindrical member having an oblique upwardly-extending recess extending from one wall thereof, a spring within said recess, a plunger within the recess and bearing against the spring, a screw extending transversely into the cylindrical member and the head thereof partially closing the lower end of said recess, a

sleeve slidably mounted on the spear, and means for locking the sleeve in its downward position covering the spring-pressed member.

10. A device of the character described, comprising a spear, locking means carried by the lower end thereof, a sleeve slidably mounted on the spear, and means for locking said sleeve in its downward position.

11. The combination with a well casing, a standing valve therein, a piston valve above the standing valve, a spear carried by the lower end of the piston valve, means carried by the lower end of the spear for locking it to the standing valve, a sleeve slidably mounted upon the spear, means for locking said sleeve in its downward position, and means carried by the sleeve for engaging the standing valve for releasing said locking means.

12. A device of the character described, comprising a spear, locking means carried by the lower end thereof, a sleeve slidable upon the spear means whereby the sleeve is normally held in its downward position inclosing the locking means, and the sleeve and spear having a bayonet slot connection for locking the sleeve in its downward position.

13. A device of the character described, comprising a spear, an outwardly-spring-pressed lock carried by the lower end of the spear, a sleeve slidable on the spear, the said spear and sleeve having a bayonet slot connection, and a coil spring surrounding the spear within the sleeve, and normally holding the sleeve in its downward position.

14. The combination with a well casing, a standing valve within the lower end thereof, a pump valve above the same, a spear carried by the lower end of the pump valve, a sleeve slidable upon the spear, a spring for normally holding the sleeve in its downward position, means for locking the sleeve in its downward position, and a projection carried by the sleeve for engaging the standing valve for releasing the sleeve.

15. The combination with a well casing, a standing valve within the lower end thereof, a piston valve above the same, a spear carried by the lower end of the piston valve, a locking means carried by the spear, a sleeve slidable upon said spear and inclosing said locking means, means for locking the sleeve in its downward position and a downwardly extending arm carried by the sleeve for engaging the standing valve for releasing the sleeve to expose the locking means.

16. The combination with a well casing, a standing valve within the lower end thereof, a piston valve above the standing valve, a spear carried by the lower end of the piston valve, a sleeve slidably mounted upon the spear means for normally locking the sleeve in its downward position inclosing the spear, and an arm carried by the sleeve for releasing

ing the sleeve to allow the spear to enter the standing valve for coupling the two together.

17. A device of the character described, comprising an elongated cylindrical member having an oblique upwardly-extending recess extending from the wall thereof, a spring within said recess, a plunger within the recess and bearing against the spring a screw extending transversely into the cylindrical member and the head thereof partially closing the lower end of said recess, a sleeve slidably mounted on the spear, and a bayonet slot connection between the spear and sleeve for locking it in its downward position covering the spring-pressed member.

18. A device of the character described, comprising an elongated cylindrical member, a lock carried thereby, a sleeve slidable on the cylindrical member and inclosing the lock, and said sleeve and cylindrical member having a bayonet slot connection and a spring within the sleeve for normally holding the sleeve locked in its downward position.

19. The combination with an oil well casing, a standing valve therein, a piston valve within the casing above the standing valve, a cylindrical spear carried by the lower end of the piston valve and having an oblique upwardly-extending recess extending from the wall thereof, a spring within said recess, a plunger within the recess and bearing against the spring, a screw extending transversely into the cylindrical member and the head thereof partially closing the lower end of the said recess, a sleeve slidable upon said spear, a coiled spring surrounding the spear within said sleeve, and having one end secured to the spear and the other end to the sleeve, said sleeve and spear having a bayonet slot connection for locking the sleeve in its downward position, and a downwardly-extending member carried by the sleeve and adapted to engage the standing valve whereby the sleeve can be released.

20. The combination with a well casing, a standing valve therein, a pump valve working above the standing valve, a spear carried by the lower end of the pump valve for interlocking with the standing valve, a sleeve slidably mounted upon the said spear, and a spring normally holding the sleeve in its downward position surrounding the spear.

21. The combination with a well casing, a standing valve therein, a pump valve working above the standing valve, a spear carried by the lower end of the pump valve for interlocking with the standing valve, a sleeve slidably mounted upon said spear, a spring normally holding the sleeve in its downward position, a lock for locking the sleeve in its downward position.

22. The combination with a well casing, a standing valve therein, a pump working above the standing valve, a spear carried by the lower end of the pump valve for interlocking with the standing valve, a sleeve slidably mounted upon said spear, a spring normally holding the sleeve in its downward position, a bayonet slot connection for locking the sleeve in its downward position surrounding the spear.

23. The combination with a well casing, a standing valve therein, a piston valve within the casing above the standing valve, a spear carrier by the lower end of the piston valve and having an oblique upwardly-extending slot from the wall thereof, a spring within said recess, a plunger within said recess, and bearing against the spring, a screw extending transversely into the cylindrical member and the head thereof partially closing the lower end of said recess, a sleeve slidable upon said spear, a coiled spring surrounding the spear within said sleeve and having one end secured to the spear and the other end to the sleeve, said sleeve having on opposite sides bayonet slots, a pin extending transversely through the spear and entering said slots, and a downwardly-extending member carried by the sleeve and adapted to engage the standing valve whereby the sleeve can be released.

24. The combination with a well casing, a standing valve therein, a pump valve working above the standing valve, a spear rigidly carried by the lower end of the pump valve, a vertically movable sleeve surrounding the spear, and means for locking the sleeve in said position covering the spear.

25. The combination with a well casing, a standing valve therein, a pump valve working above the standing valve, a spear carried by the lower end of the pump valve, a spring pressed lock carried by the spear, a movable member for covering the lock, and means for holding the movable member in a position covering the lock.

26. The combination with a well casing, a standing valve therein, a pump valve working above the standing valve, a spear rigidly carried by the pump valve, a locking member carried by the lower end thereof, a movable member covering the locking member, and means for locking the movable member in a position covering the locking member.

27. The combination with a well casing, a standing valve therein, a pump valve above the standing valve, a spear rigidly carried by the lower end of the pump valve, locking means carried by the lower end of the spear, a movable member carried by the spear covering the lock, and means for locking said movable member in its downward position covering the lock.

28. A device of the character described comprising a spear, a spring-pressed lock within the spear, a movable member normally covering the spring-pressed lock, and
5 means for normally holding the movable member in its downward position covering the lock.

29. A device of the character described, comprising a spear, a spring-pressed lock
10 within the spear, a movable member normally covering the spring-pressed lock, a bayonet slot connection for locking the movable member in its downward position covering the locking member.

15 30. The combination with a well casing, a standing valve therein, a pump valve working above the standing valve, a spear rig-

idly carried by the lower end of the pump valve, a spring-pressed lock carried by the spear for locking the same within the stand- 20 ing valve, a movable member carried by the spear and covering said lock, means for locking said movable member in its downward position, and a downwardly-extending arm carried by the movable member and 25 adapted to engage the standing valve and release the movable member.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER C. BECKWITH.

Witnesses:

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LOLA LUTZY.