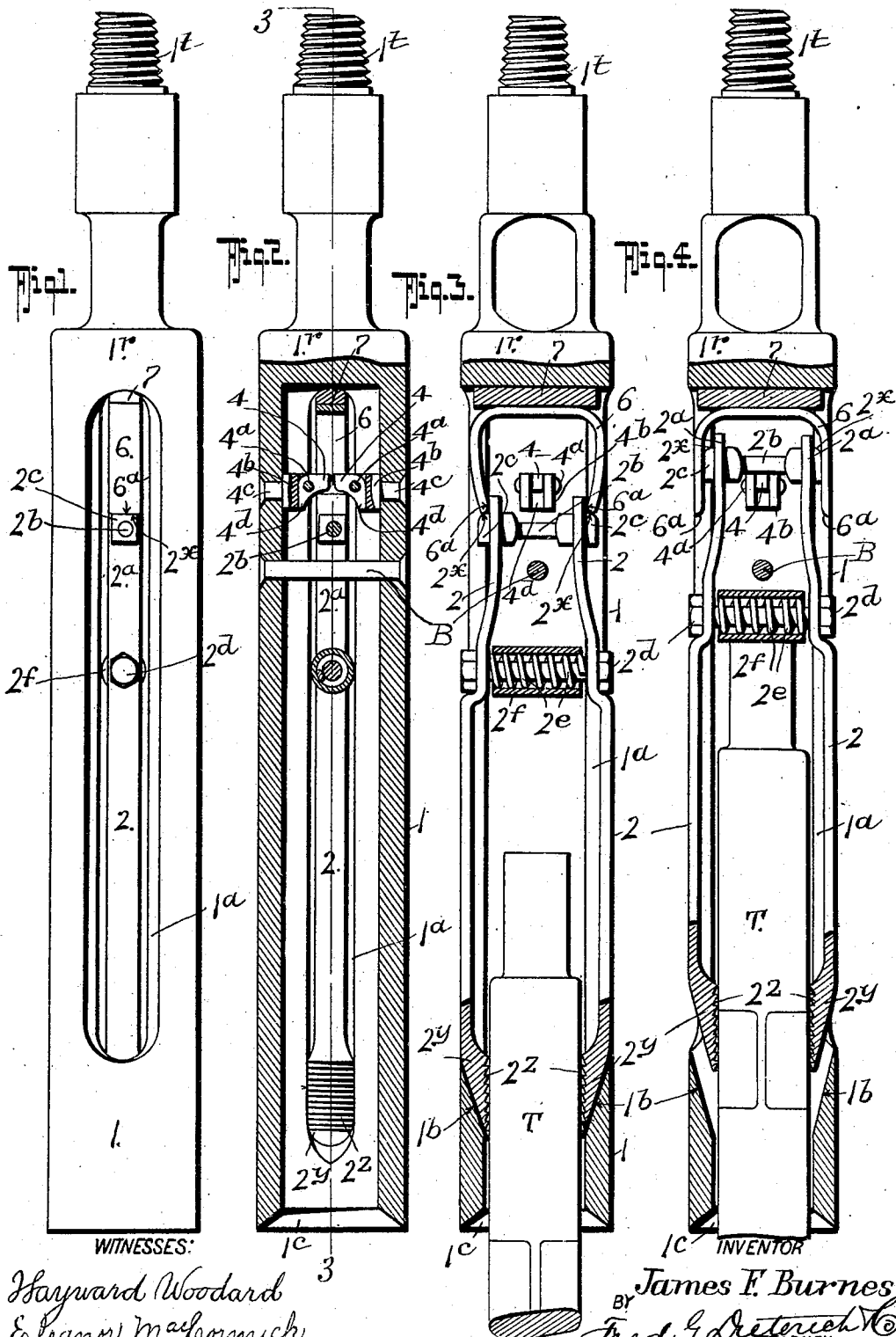


J. F. BURNES.
 DRILL ROD GRAB OR SLIP SOCKET.
 APPLICATION FILED DEC. 28, 1909.

980,920.

Patented Jan. 10, 1911.



UNITED STATES PATENT OFFICE.

JAMES FRANCES BURNES, OF FRANKLIN, PENNSYLVANIA.

DRILL-ROD GRAB OR SLIP-SOCKET.

980,920.

Specification of Letters Patent.

Patented Jan. 10, 1911.

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To all whom it may concern:

Be it known that I, JAMES F. BURNES, residing at Franklin, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in Drill-Rod Grabs or Slip-Sockets, of which the following is a specification.

My invention relates to certain new and useful improvements in devices for recovering lost tools in oil wells and the like, and in its generic nature the invention provides a tubular socket member containing a grapple or tongs that may be let down into the well to grip the lost tool, the socket having provisions for connecting with a suitable hoisting means for drawing the same out of the well. I am aware that prior to my invention devices of this general nature have been provided but in all of those devices of which I am aware no provision has been made for releasing the grapple from the lost tool in the event that the tool cannot be pulled out of the well. Heretofore grapples have been devised for gripping a tool to be lifted out of the well, and it frequently has happened that where the tool has become so tightly wedged as to be immovable, the grapple and all will be lost as no means have been provided to release the grapple from the tool in such an event.

Therefore my invention has for its object to provide a device of the character stated in which means are provided for releasing the grapple or tongs from engagement with the lost tool in the event that the tool cannot be raised.

In its more detail nature my invention embodies a tubular casing or socket in which a pair of tongs or grapple member is longitudinally slidable, the socket having provisions for engaging the tongs to cause them to move closer together at times, and means are provided that cooperate with the tongs or grapple to lock the same from movement when conditions may make necessary so that the drill rod grab may be removed from the well when the tool will not come up.

More subordinately my invention resides in those novel details of construction, combination and arrangement of parts, all of which will be first fully described, then be specifically pointed out in the appended claims and illustrated in the accompanying drawings, in which:—

Figure 1, is a side elevation of my invention. Fig. 2, is a central, vertical, longitudinal

section thereof. Fig. 3, is a vertical longitudinal section on the line 3—3 of Fig. 2, the parts being set to grab a tool. Fig. 4, is a vertical, longitudinal section on the line 3—3 of Fig. 2, the parts being in their releasing position.

Referring now to the accompanying drawings in which like letters and numerals of reference indicate like parts in all of the figures, 1 designates the socket piece or tubular member which is beveled at 1^a at its lower end to readily enter the well around the tool to be recovered. The socket 1 is closed at its upper end as at 1^r and has a threaded projection 1^t at such end to which the lifting mechanism, not shown, may be attached, or the attachment with the lifting mechanism may be made in any other desired manner, as the same, *per se*, forms no part of my present invention. The socket 1 has a pair of oppositely disposed longitudinal slots 1^a, the lower ends of which terminate in beveled surfaces 1^b to cooperate with the jaws 2^r of the legs of the tongs 2. The tongs 2 comprise two longitudinally disposed members, the lower ends of which terminate in the jaws 2^r, and the upper ends of which are bent closer together, as at 2^a, and joined by a bolt 2^b and nuts 2^c, as clearly shown in Figs. 3 and 4 of the drawings. Beneath the cross piece or bolt 2^b the tong members 2 are joined by a bolt and nut device 2^d, a coil spring 2^e being provided to tend to separate the arms 2 of the tongs. The coil spring 2^e is protected by a metal sleeve 2^f, as indicated in Figs. 3 and 4 of the drawings.

4 designates pawls pivoted at 4^a to a bearing 4^b which is riveted at 4^c to the casing 1, the pawls 4 having heels 4^d to engage the bearing 4^b and prevent movement of the pawls except in one direction so as to retain said pawls normally in the position shown in Figs. 2, 3 and 4 of the drawings.

A suitable spacing member 6 is provided, which in the present form of my invention is in the nature of a resilient U-shaped clip that fits over the upwardly projected ends of the tongs, and has its end beveled as at 6^a to cooperate with the beveled surfaces 2^x of the nuts 2^c so as to normally hold the tongs 2 in the position indicated in Figs. 2 and 3 of the drawings. The member 6 acts as a resilient clip or clamp to grip the tongs 1^a, as shown in Fig. 3, and it acts as an abutment to prevent upward movement of the

tongs under normal conditions. The tongs being of a resilient nature are normally held in a separated position, see position shown in Fig. 3 of the drawings. The tendency of the jaws 2^y to separate from one another causes pressure against the beveled parts 1^b, thus tending to force the tongs upwardly. This upward moving tendency in the tongs is counteracted by the clip 6 when set as shown in Fig. 3. Thus when the grab is lowered into the well to grip the lost tool T the jaws 2^y as the grab is lifted, after the tool T is positioned as shown in Fig. 3, will have their teeth 2^z bite into the tool T and the downward pull on the tongs caused by the tool T will cause the jaws 2^y to more tightly grip the tool and hold it locked to the grab, as will be clearly understood in the art.

A spacing block 7 of wood, or other suitable material is interposed between the closed end of the casing and the spacing clip 6 and by varying the thickness of the member 7 the gripping jaws 2^y of the tongs 2 may be set nearer together or farther apart to grip tools of different sizes, it being understood that when the tool T is of smaller diameter the spacing member 7 is made thicker and when the tool T is of greater diameter than shown in the drawings, the spacing member 7 is made thinner as conditions may require, and as readily apparent to those skilled in the art.

The members 6 and 7, either or both, (depending upon whether or not the members 7 are used), serve as a means for engaging the tongs to set the same in different positions. These members sustain or hold the tongs from upward movement when adjusted to a set position. If the block 7 is made twice as thick as it is shown in Fig. 3, for example, then the jaws 2^y would be brought closer together by the bevels 1^b and held in such position. If the block 7 is made more than twice as thick as shown in Fig. 3 of the drawings, the jaws will be further brought closer together. If, on the other hand the block 7 is made thinner than it is shown in Fig. 3, the jaws will be separated to a greater distance.

In practice the tongs 2 are set in the desired positions by the clip 6 and spacing member 7 to hold the serrated faces of the jaws 2^y a distance apart slightly greater than the diameter of the tool T to be recovered, after which the socket 1 is let down into the well so that the tool T may project up into the same. The clips 6 and spacing member 7 prevent the tongs rising up. As soon as the serrated faces 2^z have engaged the tool T, as shown in Fig. 3, the socket 1 is drawn upwardly, thus causing the serrated faces of the jaws 2^y of the tongs to bite into the tool T without being forced to do so by the beveled portions 1^b of the socket 1, and tightly grip the

tool T. If the tool will come away it can then be raised out of the well. However, should it be found that the tool is wedged too tightly to come away the grab will be released from the tool by simply forcing the socket 1 downwardly until the tool T engages the cross member formed by the bolt and nut devices 2^d, spring 2^e and sleeve 2^f and forces the tongs 2 upwardly a distance sufficient to cause the bridge portion 2^b to pass the pawls 4—4 after which the grab may be withdrawn and the tongs 2 will be prevented from engaging the tool by being held up by the pawls 4—4 coming into contact with the underside of the member 2^b, it being understood that when the tongs 2 are forced upwardly to cause the bridge 2^b to pass the pawls 4—4, the clip 6 will be spread to receive the end of the tongs, as shown in Fig. 4 of the drawings. A cross pin or rivet B is provided to limit the up and down movement of the tongs, as when the member 2^b rests on the member B the tongs 2 cannot be further lowered and when the member 2^f engages the member B the tongs 2 cannot be further raised.

From the foregoing description taken in connection with the accompanying drawings, it is thought the complete construction, operation and advantages of my invention will be readily understood by those skilled in the art to which the invention appertains.

What I claim is:

1. A drill rod grab comprising a socket, a pair of tongs longitudinally movable in the socket, means causing said tongs to grip a lost tool, means for locking said tongs in a non-gripping position at times, said last named means comprising gravity actuated pivoted pawls carried within the socket, said tongs having a bridge portion, and means for engaging the lost tool as the socket is forced thereover to raise the bridge portions of the tongs over the pawls.

2. A device of the character stated comprising a tubular socket open at its lower end and having longitudinal slots terminating in beveled portions at their lower ends, tongs mounted in said socket and having resilient portions to project into said slots and cooperate with the beveled portions thereof, said tongs having tool gripping portions, said socket having a closed end, means interposed between said tongs and said closed end for adjusting the tool gripping faces of said tongs a predetermined distance apart.

3. A device of the character stated comprising a tubular socket open at its lower end and having longitudinal slots terminating in beveled portions at their lower ends, tongs mounted in said socket and having resilient portions to project into said slots and cooperate with the beveled portions thereof, said tongs having tool gripping portions,

said socket having a closed end, means interposed between said tongs and said closed end for adjusting the tool gripping faces of said tongs a predetermined distance apart, and pawl devices for engaging said tongs at times to hold them out of engagement with the tool.

4. A device of the character stated comprising a tubular socket open at its lower end and having longitudinal slots terminating in beveled portions at their lower ends, tongs mounted in said socket and having resilient portions to project into said slots and cooperate with the beveled portions thereof, said tongs having tool gripping portions, said socket having a closed end, means interposed between said tongs and said closed end for adjusting the tool gripping faces of said tongs a predetermined distance apart, said means comprising a clip engaging said tongs and a spacing member interposed between said clip and the closed end of said clip.

5. A device of the character stated, comprising a tubular socket open at its lower end and having longitudinal slots terminating in beveled portions at their lower ends, tongs mounted in said socket and having portions projected into said slots and cooperating with said beveled portions thereof, said tongs having tool gripping portions, said tongs comprising a pair of longitudinally disposed arms, a connecting bridge piece near one end and an intermediate connecting member between the ends of said tongs, means cooperatively engaging said tongs for sustaining said tongs in an adjusted position.

6. A device of the character stated, comprising a tubular socket open at its lower end and having longitudinal slots terminating in beveled portions at their lower ends, tongs mounted in said socket and having portions projected into said slots and cooperating with said beveled portions thereof, said tongs having tool gripping portions, said tongs comprising a pair of longitudinally disposed arms, a connecting bridge piece near one end and an intermediate connecting member between the ends of said

tongs, means cooperatively engaging said tongs for sustaining said tongs in an adjusted position, and means limiting the downward movement of said tongs.

7. A device of the character stated, comprising a tubular socket open at its lower end and having longitudinal slots terminating in beveled portions at their lower ends, tongs mounted in said socket and having portions projected into said slots and cooperating with said beveled portions thereof, said tongs having tool gripping portions, said tongs comprising a pair of longitudinally disposed arms, a connecting bridge piece near one end, and an intermediate connecting member between the ends of said tongs, means cooperatively engaging said tongs for sustaining said tongs in an adjusted position, means limiting the downward movement of said tongs, and means for locking said tongs in an inoperative position at times.

8. A device of the character stated, comprising a tubular socket open at its lower end and having longitudinal slots terminating in beveled portions at their lower ends, tongs mounted in said socket and having portions projected into said slots and cooperating with said beveled portions thereof, said tongs having tool gripping portions, said tongs comprising a pair of longitudinally disposed arms, a connecting bridge piece near one end, an intermediate connecting member between the ends of said tongs, means cooperatively engaging said tongs for sustaining said tongs in an adjusted position, means limiting the downward movement of said tongs, means for locking said tongs in an inoperative position at times, said locking means comprising pawl devices carried by the casing and permitting passage of a part of said tongs in one direction and preventing passage of said tong part when moved in an opposite direction.

JAMES FRANCES BURNES.

Witnesses:

HOMER R. BLAIR,
JAMES DENMIRE.