

S. BULLUM.
COMBINATION SLIP SOCKET.
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1,365,086.

Patented Jan. 11, 1921.

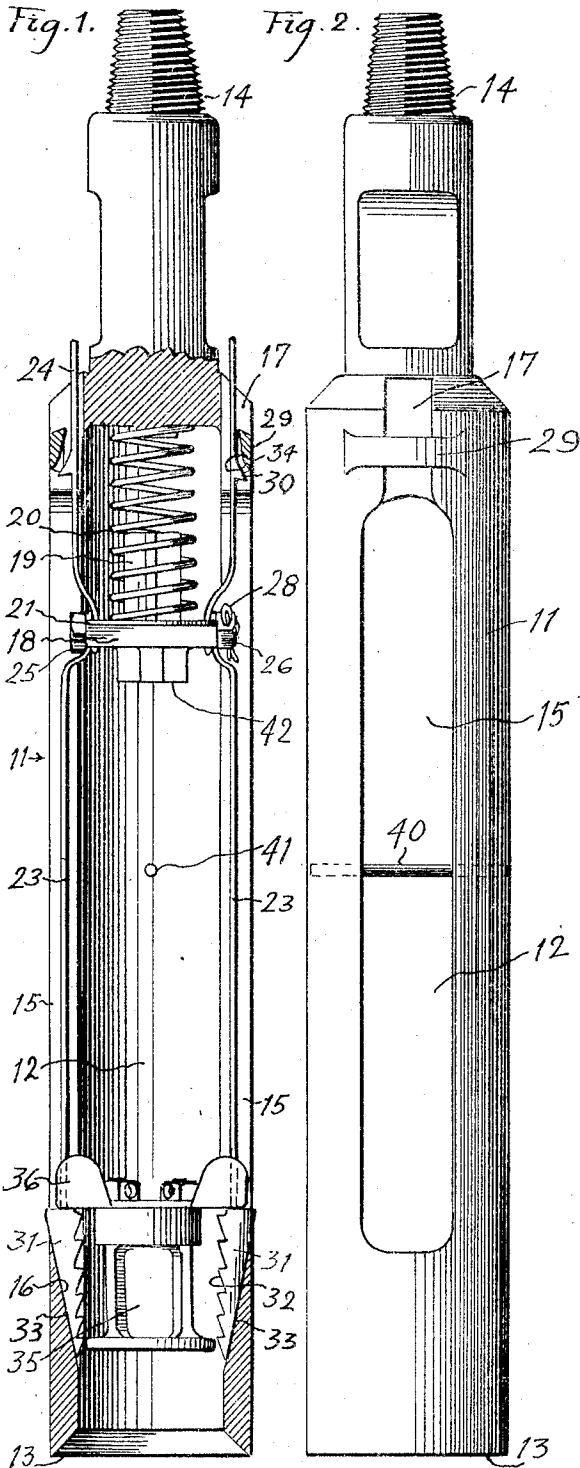
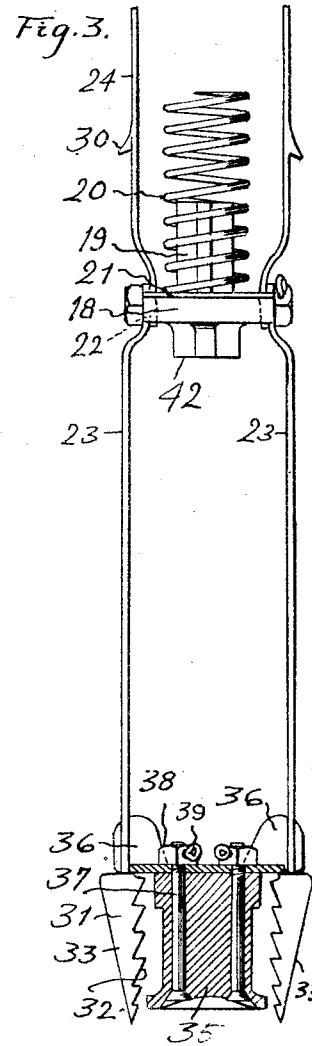
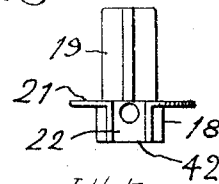


Fig. 4.



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UNITED STATES PATENT OFFICE.

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COMBINATION SLIP-SOCKET.

1,365,086.

Specification of Letters Patent.

Patented Jan. 11, 1921.

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To all whom it may concern:

Be it known that I, STEVE BULLUM, a citizen of the United States, residing in the city and county of Los Angeles and State of California, have invented a new and useful Combination Slip-Socket, of which the following is a specification.

This invention relates to apparatus for the removal of lost tools from oil and gas wells, and particularly to apparatus adapted to automatically grip any size of shank or stem upon engagement with the same; the invention being designed as an improvement on the device shown and described in Letters Patent of the United States, No. 1,244,289, granted to me on the 23rd day of October, 1917.

This invention consists in providing a tool or device of the character described, having gripping jaws adapted to be forced downward and inward to grip a tool shank, and jaw releasing means operated by contact with the lost tool.

Another object of the invention is to provide gripping jaws, operating means for them, and releasing means for them, of such a character that the same may be inserted and applied to any ordinary form of socket, without material alteration of the same.

Upon the annexed drawings, Figure 1 is a vertical sectional view of a socket embodying the principles of my invention. Fig. 2 is a side elevation of the socket. Fig. 3 is a side elevation of the gripping elements removed from the socket. Fig. 4 is a detail view of the head block.

Referring to the drawings, the body of the tool is in the form of a hollow cylinder having the casing 11 and the bore 12 extending upwardly from the lower extremity 13, and having the usual threaded extremity 14 at the top. The body 11 is provided with oppositely arranged and elongated slots 15, formed with inwardly and downwardly extending inclined faces 16 at the lower end of the slots, and terminating at the top, in the grooves 17. Within the casing is mounted the sliding head-block 18, which is provided with a shank 19 to retain the spring 20 in a central position relative to the head-block, and is provided with a table 21, having grooves 22, disposed on opposite sides, in which are mounted the spring members 23 and 24. Members 23 and 24 are secured by a bolt 25 having a

securing nut 26 adapted to receive a cotter-pin 28, the hooks 23 and 24 extending upwardly in grooves 17, and projecting therefrom for manual release of hooks 30 from retaining members 29, which is an improvement on the device set forth in my prior patent. The arrangement further prevents displacement of the grips. The shank 19, when the socket is forcibly jarred downward, prevents injury to spring 20; this shank not being shown in my prior patent. With this construction it is not necessary to jar the socket with as much force to release the grips, as with the prior device. The nut 26, as may be seen, is placed relatively inward to protect the same from injury. The slots are bridged across the grooves 17, with dove-tail members 29, serving as catches for the hooks 30, on members 24. The spring members 23 are provided at their extremities with gripping jaws 31, adapted to engage with the shank of a "lost tool." The gripping jaws are provided with the oppositely disposed gripping faces 32, and with the oppositely disposed inclined faces 33, adapted to engage with the inclined cam faces 16. The dove-tail members 29 are provided with inner inclined faces 34, serving to guide the members 24 within the space between the members 29 and the bottom of the grooves.

The grooved sliding block 35 allows circulation of water upward to prevent accumulation of grit within the socket, and serves as a locking member for the gripping jaws 31, the sliding block being provided with oppositely disposed guides 36, adapted to slide in the slots 15; the members 23 being adapted to slide between the guides 36. The guides are detachable from the sliding block, being secured by bolts 37, provided with nuts 38, which are retained by the cotter-pins 39.

The operation of the device is as follows: The gripping jaws are forced upward by means wielded by the hand, thereby compressing the spring 20 until the head-block 18 reaches a sufficient elevation for the insertion of a detent pin 40 in the apertures 41. The rod 40 ordinarily limits the downward movement of the head-block 18, and, when the head-block is in the retracted position, the sliding-block drops by its own weight, into engagement with the gripping jaws 31, thereby serving to retain them at their maximum separation as determined

by the bore of the socket. Upon lowering the device with the jaws thus elevated, into a well, the shank of the lost tool will be guided into the bore, thereby engaging with the sliding-block 35 and raising the same. 5 whereupon the gripping jaws 31, fixed to spring members 23, are forced inward into engagement with the shank of the lost tool; the gripping jaws being further urged inward by the pressure of spring 20, and the co-acting inclined faces 16. The lost tool, after being gripped by the jaws, may be released.

A most important feature of this invention is the fact that after grappling any lost tools and finding that the same cannot be pulled or jarred loose and removed from the well, the hold of the socket with the lost tool may be readily broken. This is done by jarring down upon the socket whereupon the shank of the lost tool will tend to drive the sliding-block 35 upward, which will initially break the detent pin 40, and subsequently strike the depending shank 42, of the head-block, moving the same upwardly until the hooks 30 engage with the members 29. The head-block, being thus retained in its uppermost position, will retain the gripping jaws above and in disengaged position with the inclined cam faces 16, allowing the gripping jaws to spring outward and disengage the lost tool. The detent pin 40 is only destroyed in releasing a caught tool, and ordinarily, if the lost tool 35 be raised, the pin is first removed and the socket then forced upon the tool to raise the head-block to its uppermost position.

An important feature of this device is that at a comparatively small expense any ordinary socket can be equipped with my improved gripping and releasing means. To do this, all that is necessary is to plane out the slots as a passage-way for the guides 36, plane out the seats for the insertion of the dovetail members 29, and cut the slots or grooves 17 and apertures 41.

This improvement on slip sockets insures the removal of the socket at any time after gripping the lost tool, and without any injury to the socket in breaking the hold.

The gripping jaws are effectively held in their proper position, as they are attached to and controlled by sliding blocks.

While the preferred form of the invention is herein shown and described, it is to be understood that minor changes and modifications may be made therein without departing from the scope of the invention or sacrificing any of its advantages.

60 What is claimed is:

1. A combination slip socket comprising a hollow cylindrical body having oppositely disposed guide grooves and slots, gripping jaws disposed within said body, a sliding 65 head-block disposed within the body, spring

catch-hooks extending from the sliding head-block upward through and beyond said guide-grooves, members connecting the gripping jaws with the sliding head-block, a sliding lower block disposed within said body, guides fixed to the sliding lower block and extending in the guide slots, a spring interposed between the sliding head-block and the upper end of the bore, a detent pin extending transversely in the bore of the socket body and serving to limit the downward movement of the head-block and to restrict the upward movement of the sliding lower block, and retaining means for the catch hooks serving to retain the head-block as it is forced to its uppermost position by the sliding lower block.

2. In a slip socket, the combination with a hollow and cylindrical body having oppositely disposed guide slots and guide grooves at the upper extremity of the slots, of members bridging said guide grooves, gripping jaws disposed within the body, a head-block sliding within the body, spring members connecting the gripping jaws with the sliding head-block, spring catch-hooks extending upward from the head-block and adapted to engage with the bridging members to retain the head-block in its uppermost position and extending through the guide grooves and beyond the socket body, a spring interposed between the head-block and the inner end of the bore of the body, a detent pin extending transversely in the body and serving to limit the downward movement of the head-block, a sliding locking-block disposed within the body and serving to separate the gripping jaws in the uppermost position of the head-block, guides on the locking-block engaging with the guide slots, and inclined cam faces beneath the guide slots and coacting with the spring to force the gripping jaws inwardly when the locking-block is forced upwardly therefrom.

3. A combination slip socket comprising a cylindrical body having a hollow bore and oppositely disposed guide slots and upper and lower guide grooves, said lower grooves having inclined cam faces, upper and lower sliding blocks movable in the hollow bore, spring members depending from the upper sliding block, gripping jaws fixed to the depending spring members, and having inclined faces coacting with the inclined grooves, a spring interposed between the upper end of the bore and the upper sliding block, and cooperating with the inclined cam grooves to force the gripping jaws downwardly and inwardly, a shank extending upwardly from the head-block and limiting the upward movement thereof, a removable detent pin extending transversely in the hollow bore and serving to limit the downward movement of the upper sliding-block and to restrict the upward movement of the lower 130

sliding block, bridging members disposed in the upper grooves, and spring catch hooks extending upwardly from the upper sliding block and engaging with the bridging members in the uppermost position of the upper sliding block.

4. A combination slip socket comprising a cylindrical body having a hollow bore and oppositely disposed guide slots, gripping jaws disposed within the bore, spring means to lower the jaws, a removable detent pin extending transversely in the bore and limiting the downward movement of the gripping jaws, and a sliding and independently movable member disposed beneath the detent pin and traveling in said guide slots for releasing the gripping jaws when in the elevated position, said sliding member having longitudinal grooves serving as ports of communication between the open socket end and the guide slots.

5. A combination slip socket comprising a cylindrical body having a hollow bore and oppositely disposed guide slots, inclined cam grooves below the slots, and guide grooves above the slots, gripping jaws disposed within the bore, a spring tending to force

the jaws downwardly, inclined faces on the gripping jaws co-acting with the inclined cam grooves in the lowermost position of the jaws and serving to force the jaws inwardly, bridging members disposed in the upper grooves, sliding blocks within the bore and moving synchronously with the gripping jaws, spring catch hooks extending upwardly from the sliding upper block and engaging with the bridging members in the uppermost position of the gripping jaws, said spring catch-hooks extending through said guide grooves and beyond the socket body, a locking block in engagement with the guide slots and serving to separate the jaws in their uppermost position, and a detent pin disposed transversely in the bore and serving to limit the downward movement of the gripping jaws, and to restrict the upward movement of the locking-block, said detent pin being broken to permit the locking block to move upward and actuate the sliding upper block to its uppermost position.

In testimony whereof, I hereunto affix my signature, this 3rd day of March, 1920.

STEVE BULLUM.