April 9, 1940. R. K. HERTEL 2,196,460

SAFETY HOOK

Filed April 13, 1936

Fig. 3

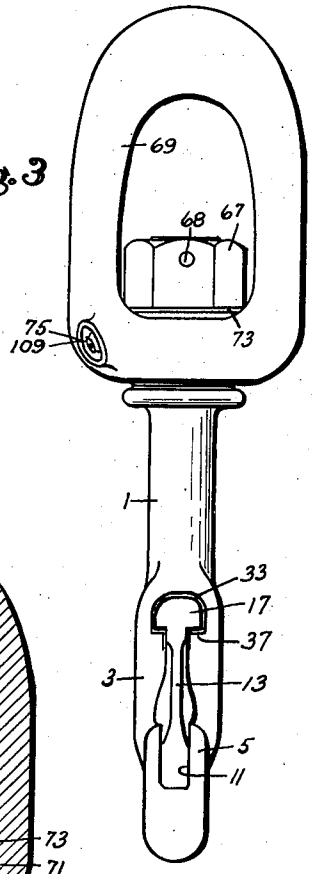


Fig. 1

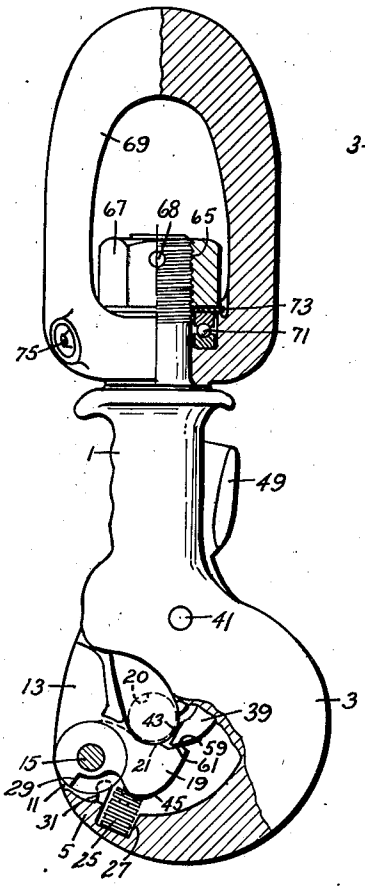
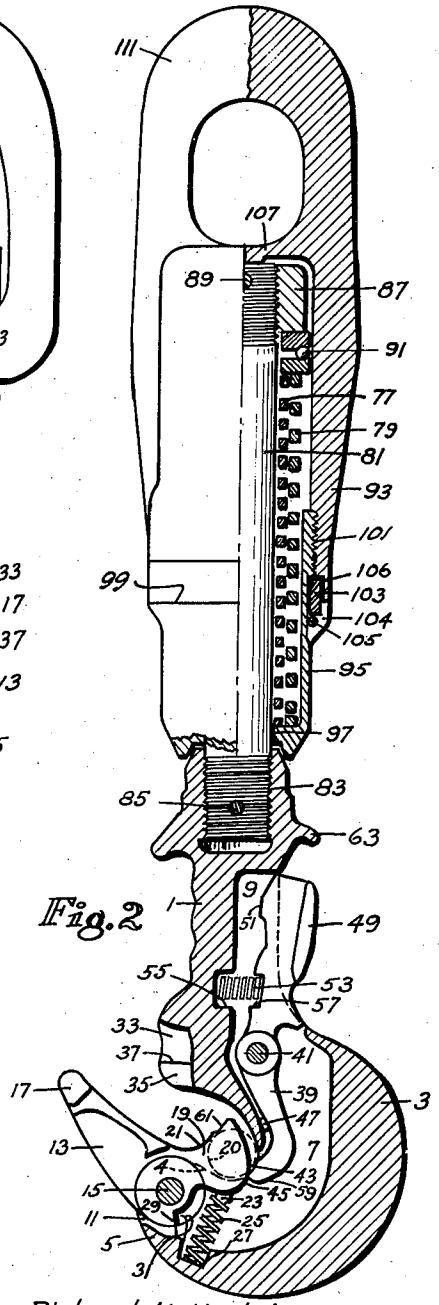


Fig. 2



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SAFETY HOOK

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Application April 13, 1936, Serial No. 74,109

5 Claims. (Cl. 294—82)

This invention relates to safety hooks such as are used for handling oil well rods or tubing. More particularly the invention relates to improvements in that type of rod hook shown in Reissue Patent No. 16,613, issued May 3, 1927, to Joseph F. Moody and Virgil L. Du Bois.

It is an object of the present invention to provide an improved safety latch for hooks of the Moody and Du Bois type.

Another object is to provide a latch actuating lever which can not become entangled in the hand of an operator if the hook should fail to swivel properly.

Another object is to provide a locking arm which not only prevents a bail from jumping out of the hook, but also serves to carry a part of the load, thereby greatly strengthening the hook.

Another object is to provide a safety hook which will open automatically when the latch is released and will be closed and locked automatically when a bail is inserted into the hook socket.

Another object is to provide an improved housing construction for a spring swivel hook.

Other objects and advantages will be seen from the folding description and drawing.

Figure 1 is a vertical elevation, partly in cross section, of one form of my invention showing the hook in the closed position.

Figure 2 is a vertical elevation partly in cross section of a hook similar to that shown in Figture 1, but provided with a spring for supporting the load resiliently. The hook is shown in the open position.

Figure 3 is a front elevation of the hook shown in Figure 1.

Like numerals indicate like parts in the various figures.

The hook comprises a hook-shaped member having a shank portion 1, a body portion 3 and a bill portion 5, forming a bail-receiving socket 4. The body 3 is provided with a channel portion 7 extending longitudinally through the body 3, terminating at its upper end in a recess 9 in the back of the shank 1, and terminating at its lower end in a slot 11 in the end of bill 5. A locking arm 13 is pivoted intermediate its ends in the slot 11 as indicated at 15. The outer end of locking arm 13 is provided with lateral lugs forming a T shaped head 17. The inner end of locking arm 13 comprises a tail portion 19 adapted to be engaged by a bail indicated in dotted lines at 20 to move the locking arm to the closed position when a load is imposed thereon. To insure that the locking arm will be fully closed even though the bail 20 does not seat squarely on the tail 19, said tail is provided with a raised portion 21 which extends slightly above the top surface of the bill 5 (see Fig. 1). The lower side of tail 19 is provided with a downwardly extending lug 23 adapted to engage a coil compression spring 25 housed in a recess 27 formed in the lower portion of the bill 5. The spring 25 normally urges the locking arm 13 to the open position shown in Fig. 2. A stop 29 on the locking arm 13 engages a shoulder 31 in bill 5 to limit the opening movement of the locking arm.

The hook member 3 is provided on its front face with an inwardly extending pocket 33 directly above the pivot pin 15. A vertical slot 35 extends downwardly from pocket 33 through the body 3 and is adapted to receive the shank of the locking arm 13. The lower wall 37 of the pocket 33 provides a shoulder against which the lower faces of the T head 17 will bear if the load on the hook becomes large enough.

A latch lever 39 is positioned within the channel 7 and is pivoted intermediate its ends to the body 3 as shown at 41. The lower end of the latch lever 39 is provided with a cam face 43 adapted to engage a curved cam face 45 on the tail 19 when the locking arm 13 is in the open position (Fig. 2). The latch lever 39 is provided near its lower end with a stop 47 adapted to engage the forward wall of the channel 7 to limit the outward movement of the latch face 43 to a position flush with the inner face of the bill 5. The upper end of the latch lever 39 is provided with a hand grip 49 which extends outwardly through the recess 9. Inward movement of the head 49 is limited by a stop 51 which engages the wall of the shank 1. A coil compression spring 53 is housed in a pair of pockets 55 and 57 formed in the shank and lever, respectively, and is adapted to normally urge the latch lever to the locked position. The lower end of the latch lever 39 is provided with a downwardly facing cam surface 59 adapted to coact with an upwardly facing cam surface 61 on tail 19, so positioned with respect to the pivot pin 41 that the pressure of the tail 19 in an opening direction tends to hold the lever 39 more tightly in the closed position.

To release the locking arm 13 the lever head 49 is pushed toward the shank 1 thus releasing the tail 19 from the latch lever 39, whereupon the spring 25 moves the locking arm 13 to the open position shown in Fig. 2.

Because hooks for use on oil wells are subject to severe shocks which tend to open the latching means prematurely, and because such shocks are most often in a vertical direction, I position the two springs 25 and 53 with their axes at substantially a right angle to each other, with one spring in approximately a horizontal position. Since both of these springs tend to hold the locking arm in the latched position (when closed) a blow or jar in either the vertical or horizontal plane (which might tend to compress

one of the springs) will not tend to compress the other spring. Inasmuch as the spring 53 is the one which is principally relied upon to keep the latch locked, I prefer to place this spring in the horizontal position.

The upper portion of the shank 1 is provided with a circumferential rib 63 which serves as a guard to protect the latch head 49 and the hand of the operator.

In the hook shown in Fig. 1 the upper end of the shank 1 is threaded as indicated at 65 to receive a nut 67. A bail 69 and ball bearing 71 surround the shank and are secured by the nut 67 which is locked to the shank by means of a cross-pin 68. A washer 73 is interposed between the nut 67 and bearing 71 to serve as a cover plate to keep dirt out of the bearing. A lubricator for the bearing is indicated at 75.

The hook shown in Fig. 2 differs from the hook shown in Fig. 1 in that it is provided with a spring cushioning member. In the construction shown in the drawing two coil compression springs 77 and 79 are shown, arranged concentrically about shank extension 81. The shank portion 1 is counterbored and internally threaded at its upper end as indicated at 83. The shank extension 81 is threaded at both ends and is screwed into the end of shank 1 and locked thereto by some suitable means such as the cross pin 85. The upper end of the shank extension 81 carries a nut 87 which is locked thereto by means of a cross pin 89. A ball bearing 91 is interposed between the nut 87 and the top of the springs 77 and 79.

The springs 77 and 79 are enclosed in and supported by a housing which, in the example shown, comprises an upper cylindrical member 93 and a lower cylindrical member 95. The lower member 95 is provided with an inwardly extending flange 97 upon which the lower ends of springs 77 and 79 are supported. Member 95 is also provided intermediate its ends with an outwardly extending flange 99. That portion of member 95 which is above the flange 99 is threaded externally as indicated at 101, to receive the threaded lower end of the upper cylindrical member 93, the latter member seating upon the flange 99. The members 93 and 95 are locked against relative rotation by means of a key 103 which is secured in place by a cotter pin 105. The key 103 is received in complementary slots 104 and 106 formed in the upper and lower housing members, respectively. The lower slot 104 is open on its downward side. The cotter pin 105 extends across this opening below the key 103 to keep the key from falling out. There is only one slot 104 in the lower housing, but the upper housing is provided with a series of slots 106 arranged around the lower end of the housing.

The upper end of housing member 93 is closed by a wall 107 which serves to keep water and dirt out of the spring housing and bearing. A lubricant fitting 109 is provided in the housing opposite the upper position of the bearing 91. The upper end of the housing member 93 is provided with a bail member 111 integral therewith.

The foregoing description covers a preferred embodiment of my invention, but it is to be understood that the details of construction may be varied within the scope of the appended claims.

I claim:

1. In a hoist line hook a body member forming a hook portion, a shank extending upwardly from said body, an enlarged head on the upper end of said shank, a housing surrounding said shank comprising an upper member and a lower member detachably secured together, a bail integral with and extending upwardly from the top of said upper member, an annular inwardly extending flange at the lower end of said lower housing member, a coil compression spring interposed between said flange and said head and antifriction bearing means interposed between said shank and housing.

2. In a hoist line hook a body member forming a hook portion, a shank extending upwardly from said body, an enlarged head on the upper end of said shank, a housing surrounding said shank comprising an upper member and a lower member detachably secured together, said upper housing member having a wall closing the upper end thereof and integral therewith and a bail integral with and extending upwardly from the top thereof, said lower housing member having at its lower end an annular inwardly extending flange, a coil compression spring interposed between said flange and said head and antifriction bearing means intrposed between said shank and housing.

3. In a hoist line hook a body member forming a hook portion, a shank extending upwardly from said body, an enlarged head on the upper end of said shank, a housing surrounding said shank comprising upper and lower housing members detachably secured together, complementary registering slots in the threaded ends of said housing members, an opening from one of said slots for the insertion of a key, a key inserted in said slots, means for securing said key against accidental removal from said slots, a bail integral with and extending upwardly from the top of said upper housing member, an annular inwardly extending flange on the lower end of said lower housing member, a coil compression spring interposed between said flange and said head and antifriction bearing means interposed between said shank and housing

4. A hoist line hook as defined in claim 3 in which the upper housing member is provided with a plurality of circumferentially disposed slots adapted to selectively register with the slot in said lower housing member.

5. In a hoist line hook, a body member forming a hook portion, a shank extending upwardly from said body, an enlarged head on the upper end of said shank, a coil compression spring surrounding said shank below said head, a housing surrounding said shank and spring and comprising an upper housing section and a lower housing section, said lower housing section having an integral flange extending inwardly from the lower extremity thereof and forming an abutment for the lower end of said spring, said upper housing section having an integral suspension bail extending upwardly from the upper end thereof, said bail forming an eye of a size only substantially sufficient to accommodate suspension means and insufficient to permit the insertion of said spring through the upper end of said upper housing section, and the lower extremity of said upper housing section being readily detachably connected to the upper extremity of said lower housing section, whereby said housing sections may be readily separated to afford access to the interior of said housing.

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