Nov. 26, 1929. E. J. SHAFFER 1,737,029

SUCKER ROD ELEVATOR

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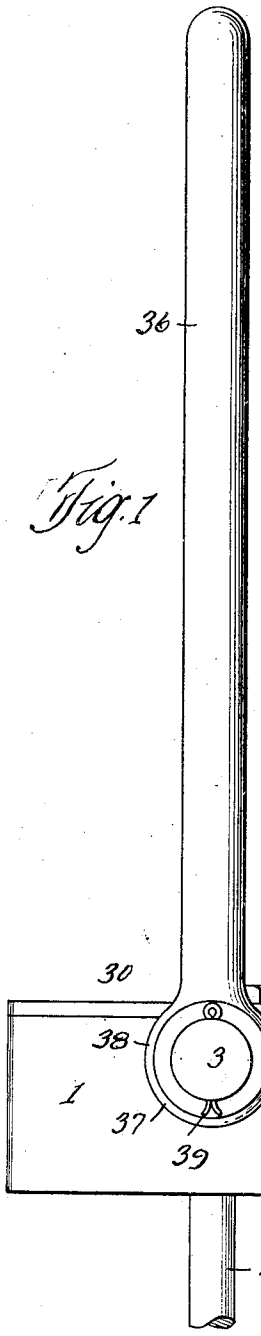

Fig. 1

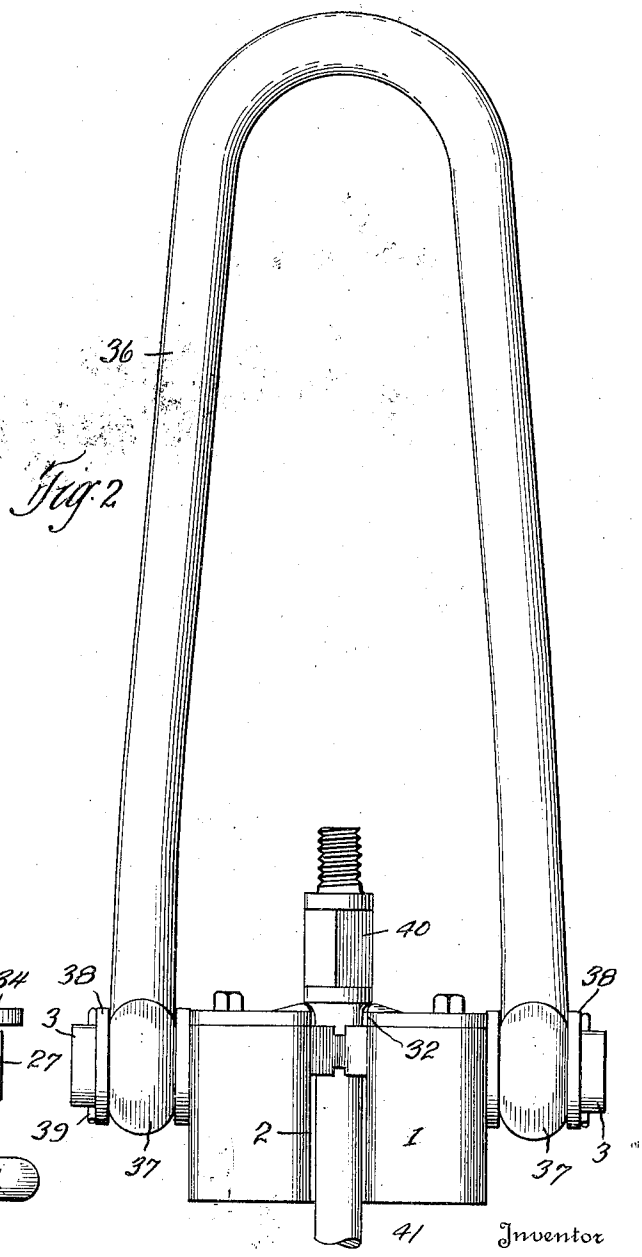

Fig. 2

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SUCKER ROD ELEVATOR

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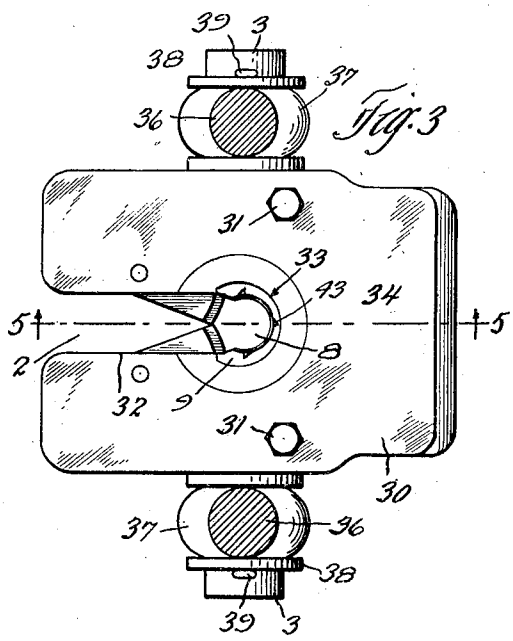

Fig. 3

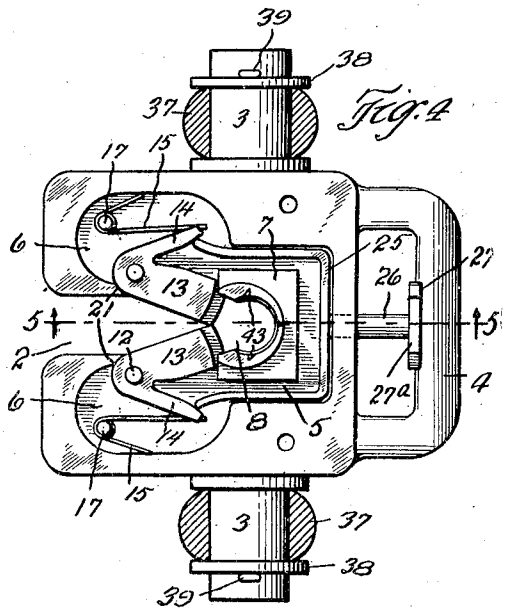

Fig. 4

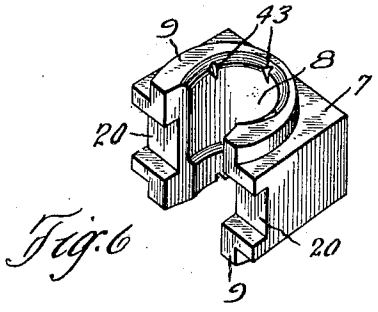

Fig. 6

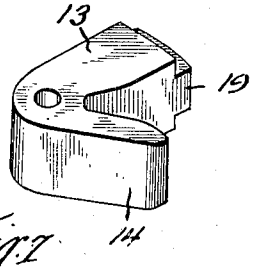

Fig. 7

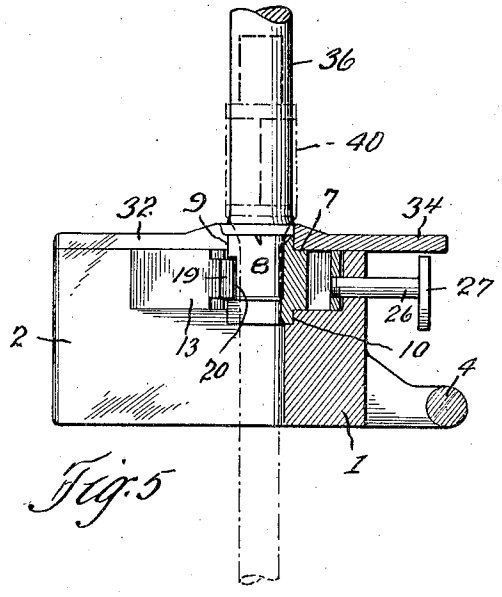

Fig. 5

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UNITED STATES PATENT OFFICE

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SUCKER-ROD ELEVATOR

Application filed January 14, 1927. Serial No. 161,221.

This invention relates to improvements in sucker rod elevators that are used with hoisting lines for withdrawing sucker rods from, and lowering them into, deep wells, such as oil wells.

The general objects of the invention are the production of a sucker rod elevator that is strong and durable; that is simple of construction; that is particularly convenient of use; that is so balanced as to automatically assume and maintain a proper position for application to a sucker rod; that is equipped with means for releasing the elevator from a rod, which means may be readily manipulated by the operator while grasping the handle of the elevator for the purpose of withdrawing it from a rod; that incorporates a shield for protecting the operator's hand while applying the elevator to or withdrawing it from a rod; that involves means for holding a rod against turning while screwing or unscrewing another rod onto or from the held rod, thus obviating the need of a wrench for such purpose; and that incorporates a reversible rod-holding die having rod-engaging portions at its opposite ends that are of different sizes whereby the elevator is adapted for use with sucker rods of different diameters.

The objects above enumerated, with others which will appear as this description proceeds, are attained in the embodiment of the invention illustrated in the accompanying drawings wherein similar reference characters designate corresponding parts throughout the several views.

In the drawings, Fig. 1 is a side elevation and Fig. 2 a front elevation of my improved sucker rod elevator; Fig. 3 is a plan view of the elevator with the bail in section; Fig. 4 is a similar view with the cover removed and the eyes of the bail sectioned on the center lines of the trunnions; Fig. 5 is a central vertical section through the elevator on the lines 5—5 of Figs. 3 and 4; Fig. 6 is a perspective view of the reversible rod-holding die; and Fig. 7 is a similar view of one of the rod-confining dogs.

The body of the elevator is designated 1, and a relatively deep rod receiving slot 2 opens through the front face thereof. Trunnions 3 project from opposite sides of the body, nearer the top than the bottom thereof, and substantially in transverse alignment with the inner end of slot 2, and a handle 4 extends from the rear of the body adjacent its lower end, the same being shown in the form of a bail. The trunnions and handle are preferably formed integral with the body.

A cavity 5 is formed in the top surface of the body, and, on opposite sides of the slot 2, merges into compartments 6.

Occupying the cavity 5 adjacent the inner end of the slot 2 is a reversible rod-holding die 7 that is preferably constructed of steel and case hardened so as to resist the hard wear to which it is subjected in use. The die is formed with a rod receiving notch 8 which registers with the slot 2 of the body 1, and surrounding this notch at top and bottom are U-shaped bosses 9. The bottom wall of the cavity 5 is recessed, as shown at 10 in Fig. 5, to receive one of these bosses thereby to assist in holding the die in place. The main body portion of the die is rectangular and is of a depth substantially equal to that of the cavity 5.

Supported for oscillation upon pivots 12 in the compartments 6 are rod-retaining dogs 13 which have arms 14 that extend well into the compartments where they are engaged by springs 15 shown as formed with eyes that encircle pins 17 which rise from the bottoms of the compartments. These springs 15 tend to swing the dogs outwardly with their free ends in engagement with each other and across the open side of the notch 8 of the rod-holding die 7. To insure the dogs and die against relative displacement tongues 19 which project from the ends of the dogs operate within grooves 20 in the front face of the die. Attention is also called to the fact that the body portions of the dogs 13, adjacent the pivots 12, bear against shoulders 21 of the body 1, thereby to relieve the pivots of any shearing action resulting from the engagement of the dogs by a sucker rod as it tends to withdraw from the die in opposition to the holding effect of the dogs.

A U-shaped actuator 25 is housed within

the cavity 5 and the forward ends of its opposed branches bear against the arms 14 of the dogs 13. A pin 26 is guided within an opening in the rear wall of the cavity 5 and has its inner end secured to the central portion of the actuator 25, while its outer end is provided with a head or button 27.

A cover 30, having substantially the same outline in plan as the body 1, is secured to the top of the body by means of cap screws 31, and it is provided with apertures which receive the upper ends of the pivots 12. Also, the cover has a slot 32 that registers with the slot 2 of the body, and at its inner end is enlarged at 33 to receive one of the bosses 9 of the die 7. An extension 34 of the cover 30 overhangs the rear side of the body 1 and serves as a guard to protect the hand of the operator as it grasps the handle 4. The connection of the previously mentioned pin 26 with the actuator 25 is preferably effected by screwing the pin into a tapped hole in the actuator and to prevent the pin from unscrewing one side of its head is flattened at 27ª for cooperation with the extension 34 of the cover.

The elevator is adapted to be suspended from a hoisting line in accordance with the usual practice through a safety hook or the like (not shown) that is adapted to be engaged with a bail 36, the branches of which terminate in eyes 37 that are journaled upon the trunnions 3. Washers 38 are applied to the trunnions beyond the eyes 37 and are held thereon by suitable means, such as cotter pins 39 that are extended through holes in the trunnions.

The fact that the trunnions 3 are situated above the center of gravity of the body 1 insures the elevator hanging upright in readiness for application to a rod.

In the use of the elevator, assuming that the same is suspended from a hoisting line, the operator grasps the handle 4 and swings the elevator to one side of the string of sucker rods as the same is raised in a well known manner, and when the string has been lifted so that the box or coupling 40 of a rod 41 is at a proper elevation, the hoisting of the string is stopped and the operator swings the elevator onto the rod, the rod entering the holding die through the slot 2 of the body and the corresponding slot 32 in the cover 30. The dogs 13 swing out of the way in opposition to the springs 15 as the rod passes into the notch 8 of the die 7, and as soon as the rod occupies said notch the dogs are projected by the springs 15 into holding position, as shown in the drawings. As the string is subsequently lowered the enlargement of the rod 41 adjacent the coupling 40 settles within the upper end of the die 7, and in order that the rod may be held against turning so that the rod thereabove may be unscrewed from the held rod, the die is serrated about the upper edge of its notch to provide teeth 43 which bite into the rod and thus restrain it from rotating.

When it is desired to release the elevator from a rod, the operator grasps the handle 4 and with this thumb pushes the head or button 27 of the pin 26 thereby to advance the actuator 25 and, through its cooperation with the arms 14, swing the dogs 13 outwardly so as to open the notch of the die and allow the rods to pass freely through the slots of the body and cover as the elevator is swung rearwardly.

It will be noted especially from Fig. 6 that the notch of the rod-holding die 7 is different in width at its opposite ends and it follows from this that by reversing the die the elevator may be adapted to the handling of rods of different diameters.

Having thus described my invention, what I claim is:—

1. A sucker rod elevator comprising a body having a rod receiving slot, a rod holding die mounted within the body adjacent the inner end of said slot and having a notch that opens into the slot, a dog pivoted to the body forwardly of said die for closing the notch of the die, means tending to move the dog to closing position, and an actuator for moving the dog in opposition to said means, the die and dog having, one a groove, and the other a tongue projecting into said groove.

2. A sucker rod elevator comprising a body having a rod receiving slot, a reversible die mounted within said body adjacent the inner end of said slot and having a notch registering with the slot, said die having seats at its opposite ends that are of different sizes for engagement by the couplings of rods of different diameters, a dog pivoted to the body forwardly of the die for closing the notch thereof, means tending to move the dog to closing position, and an actuator for moving the dog in opposition to said means.

3. A sucker rod elevator comprising a body having a rod receiving slot, a reversible die mounted within said body adjacent the inner end of said slot and having a notch registering with the slot, said die having seats at its opposite ends that are of different sizes for engagement by the couplings of rods of different diameters, and means for retaining a rod within the notch of the die.

4. A sucker rod elevator comprising a body having a rod receiving slot in its front side and a handle on its rear side, the body having a cavity in its top surface surrounding the inner end of the slot, a pair of dogs pivotally supported within said cavity on opposite sides of said slot and forwardly of the inner end thereof for closing the same, said dogs having laterally extending arms, springs housed within the cavity and engaging said arms for swinging the dogs to slot closing position, a U-shaped actuator within the cavity the ends

of the opposed branches of which are in operative relation to said arms whereby when the actuator is moved forwardly it will swing said dogs in opposition to the aforesaid springs, the rear wall of the cavity having an aperture, a member extending from the central portion of the actuator through said aperture and having its rear end disposed adjacent the aforesaid handle, and a cover applied to said body and having a slot registering with the rod receiving slot of the body.

5. A sucker rod elevator comprising a body having a rod receiving slot in its front side and a handle on its rear side, the body having a cavity in its top surface surrounding the inner end of the slot, a pair of dogs pivotally supported within said cavity on opposite sides of said slot for closing the same, said dogs having laterally extending arms, springs housed within the cavity and engaging said arms for swinging the dogs to slot closing position, a U-shaped actuator within the cavity the ends of the opposed branches of which are in operative relation to said arms whereby when the actuator is moved forwardly it will swing said dogs in opposition to the aforesaid springs, the rear wall of the cavity having an aperture, a pin extending through said aperture and threaded into the central portion of the actuator, the outer end of said pin being provided with a head that is disposed adjacent the aforesaid handle, and a cover applied to the body and extending rearwardly over the handle, the head of said pin being flattened on one side for cooperation with the underside of the extended portion of the cover thereby to restrain the pin from turning, the cover having a slot registering with the rod receiving slot of the body.

In testimony whereof, I hereunto affix my signature.

ERNEST J. SHAFFER.