July 26, 1927. 1,637,056

A. L. SEGELHORST

SLIP HANDLER

Filed April 7, 1924 2 Sheets-Sheet 1

Fig. 1.

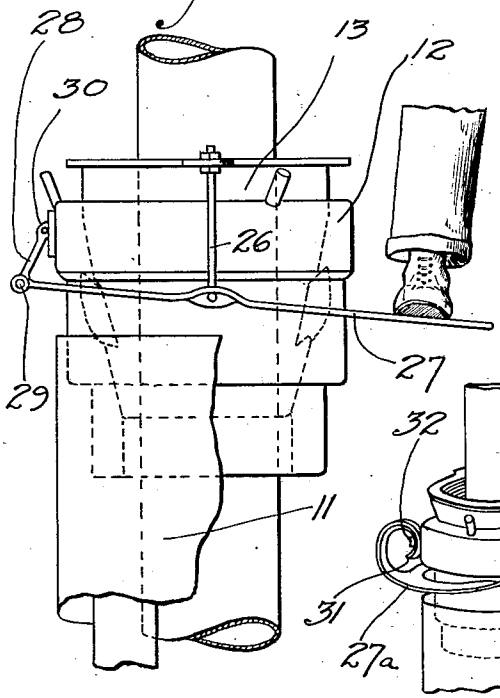


Fig. 2.

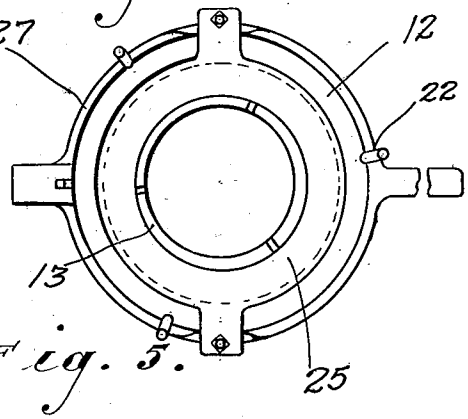


Fig. 5.

Fig. 6.

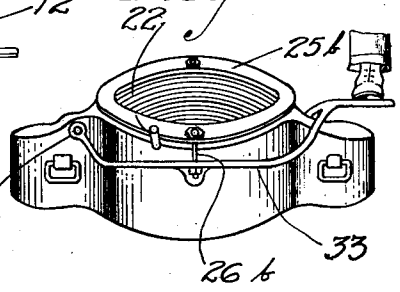


Fig. 4.

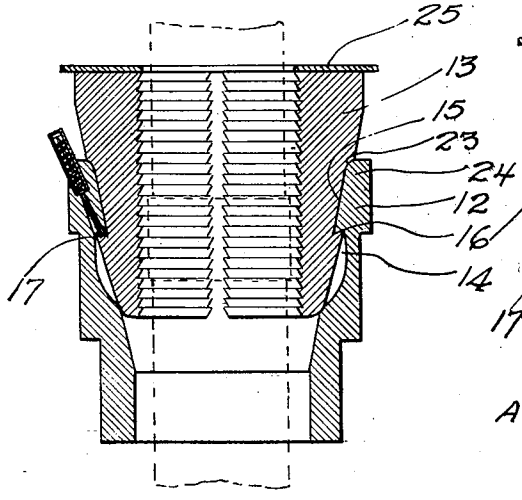
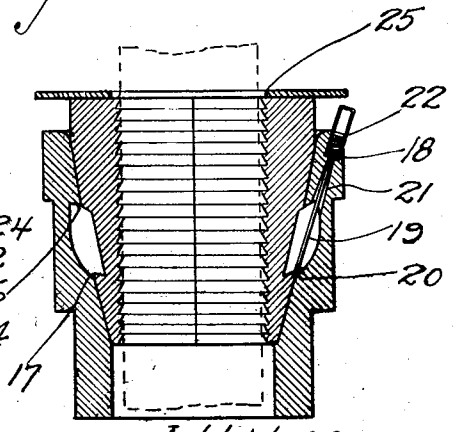


Fig. 3.



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Fig. 7.

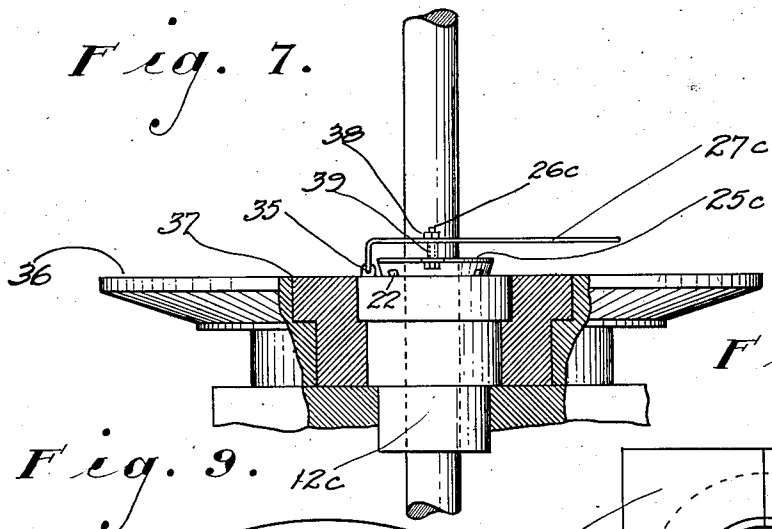


Fig. 8.

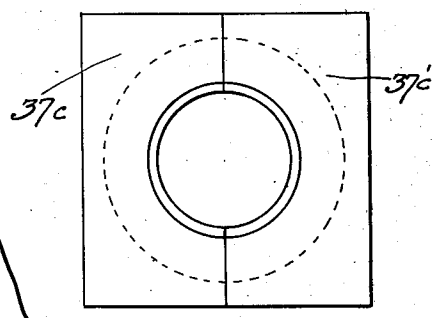
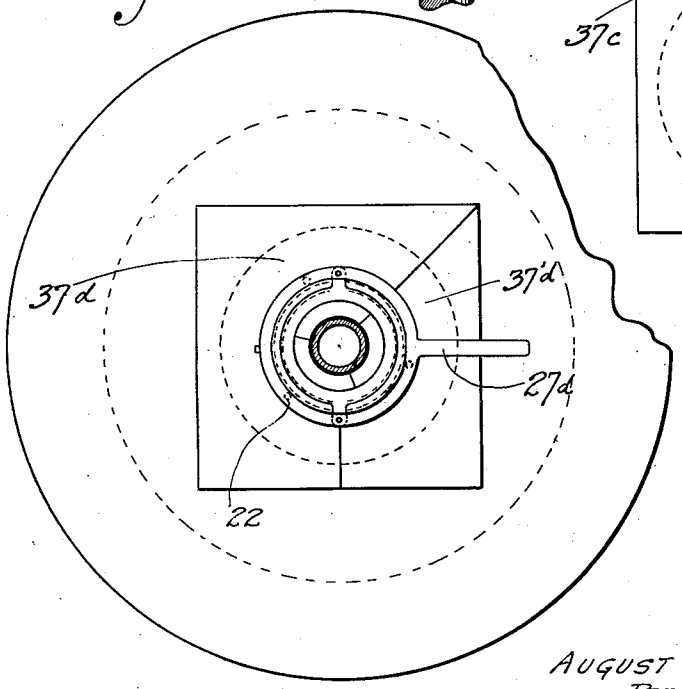


Fig. 9.



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Patented July 26, 1927. 1,637,056

UNITED STATES PATENT OFFICE.

AUGUST L. SEGELHORST, OF WHITTIER, CALIFORNIA.

SLIP HANDLER.

Application filed April 7, 1924. Serial No. 704,748.

My present invention being referred to as a slip-handler, it may be understood to be an object of this invention to provide means whereby slips, such as are commonly employed in the supporting of a string of pipe, may be easily and reliably moved into or out of an engaging position, without necessitating a separate or manual manipulation thereof.

It is an object of this invention to provide means whereby a set of slips may be simultaneously and harmoniously moved to or from an engaging position by simple mechanism, which may include a depressing ring and a lever, under the control of a single operative.

It is an object of this invention to provide means for moving a set of slips at will in either of two opposite directions; and a preferred embodiment of my invention may comprise resilient means tending to elevate or hold slips constituting a set in an upper or disengaging position, and a lever connected or integral with a depressing ring and pivoted to a supporting body, for forcing said slips at will into an engaging position.

It is a further object of my invention to provide slip-handling means whose principles of construction and operation shall be such as to permit of their embodiment in or application to a wide variety of pipe-handling devices, such as packing spiders, drawing spiders, and rotary tables or table bushings; and preferred embodiments of my invention are such as to permit of a ready substitution of my slip-handling device for devices or parts of less efficiency that are in current use.

Other objects of my invention will appear from the following description of alternative embodiments thereof, taken in connection with appended claims and accompanying drawings, in which

Fig. 1 is an elevational view, with parts broken away, showing an embodiment of my invention suitable for use in a packing spider.

Fig. 2 is a plan view of the same.

Fig. 3 is a vertical section corresponding to Fig. 1, and showing the slips in depressed engaging position, but with the depressing means not shown.

Fig. 4 is a view similar to Fig. 3 but showing the slips in an elevated position.

Fig. 5 is a perspective view of a similar embodiment of my invention hereinafter referred to.

Fig. 6 is a perspective view of an embodiment of my invention as same may be applied to a two-lug drawing spider.

Fig. 7 is an elevational view, with parts broken away, showing an adaptation of my invention to use in connection with table bushing mounted in a rotary drilling table.

Fig. 8 is a separate view of a split table bushing suitable for optional use in such an organization as is shown in Fig. 7.

Fig. 9 is a top plan view of an alternative adaptation of my invention to use in connection with a rotary table, a split table bushing being in this case identical or integral with the supporting body of my slip-handler.

Referring to the details of that specific embodiment of my invention shown in Figs. 1 to 4 inclusive, 11 may be a packing spider body, of a usual construction constituting no part of my present invention; and 12 may be a spider suitable for use in connection therewith and modified, as hereinafter described, to resiliently support a set of slips 13 of somewhat special design.

Normally to hold the slips 13 when the weight of a pipe string is withdrawn therefrom in an elevated or withdrawn position relatively to the spider or supporting body 12, undercutting at 14 the interior surface of the spider 12, I may provide the respective slips with corresponding transverse channels 15 in such manner as to provide co-operating shoulders 16 and 17 respectively upon the spider 12 and the slips 13. The members referred to being oppositely cut away to permit interfitting, and consequent rapid retraction the contacting of these shoulders is adapted to limit the upward or withdrawal movement of said slips; and this upward or withdrawal movement may be effected by resilient means such as the compression springs 18, through which extend rods 19, shown as pivoted or otherwise secured at 20 to the respective slips as by pins shown as extending through the shoulders 17 thereon. Tapered or ample channels 21 may be provided to permit a free movement of the rods or links 19, and housings 22, shown as threaded into the spider or supporting body 12, may be provided to protect the springs 18 from liability to accidental damage. As will be appreciated from an inspection of Figs. 3 and 4,

the springs 18, or their equivalent, may be effective normally to hold the slips 13 in an elevated position, in which position the shoulders 23, upwardly terminating the transverse channels 15, may overlie and rest upon corresponding shoulders or the top surface 24 of the spider or supporting body 12; and in order harmoniously and simultaneously to depress at will a set of slips supported in the manner described, or in any equivalent manner, I may employ means such as a depressing ring 25, this ring being shown as immediately contacting with the upper surfaces of a set of slips and as connected by links or rods 26 with a lever 27, intended to be arranged conveniently for depression by merely stepping thereon, one end of this lever being shown as secured relatively to the spider 12, a link 28 being optionally interposed and pivoted at its respective ends, by means of pins 29 and 30, to the lever 27 and the spider 12.

In the alternative form shown in Fig. 5, no part corresponding to the link 28 being employed, a lever 27^a is shown as formed from a single piece of heavy sheet metal rebent at 31 and slotted to permit of its pivoting upon a lag bolt 32 threaded into the body 12.

In the alternative form shown in Fig. 6, a forked lever 33 is shown as pivoted at 34 to the body of a two-lug drawing spider, and as connected by links or rods 26^b with a depressing ring 25^b, the remaining parts being substantially as indicated in the preceding figures.

In the alternative form shown in Figs. 7 and 8, a supporting body 12^c, which may be similar in form to the packing spider shown in Figs. 1 to 5 inclusive and may be suitable for use as an ordinary spider, is provided on its upper surface with a perforated lug 35, to which is pivoted a lever 27^c, this lever being connected with a depressing ring 25^c by means of rods or links 26^c; and the interior organization of this slip-handler may be substantially such as has been described above. To permit an advantageous seating of this organization in a rotary table 36, I may employ either an integral bushing 37 or a split table bushing comprising sections 37^c and $37^{c'}$, as shown in Fig. 8; or I may optionally employ a split table bushing comprising sections 37^d and $37^{d'}$, which may be regarded as permanently connected or integral with corresponding sections of a supporting body, the foot lever 27^d being substantially identical in structure and relationships with the corresponding lever 27^c, as disclosed in Fig. 7. In the forms of my invention disclosed in Figs. 7, 8 and 9, nuts 38 and sleeves 39 may be employed in connection with the rods or links 26^c; and when the springs by which my slips are normally held in withdrawn position are not housed entirely within a supporting body, the upper ends thereof may be protected by threaded housings whose outer ends may appear substantially as indicated at 22.

Although I have herein described several alternative embodiments of my invention, it will be understood that various features thereof may be independently employed, and also that various additional modifications might be made, by those skilled in the art, without the slightest departure from the spirit and scope of my invention, as the same is indicated above and in the following claims.

I claim as my invention:

1. A device of the character described comprising, a housing, a pair of opposed slips slidable therein, said slips and housing being provided upon their engaging faces with transverse recesses producing interfitting parts whereby the slips are adapted to move outwardly to clear the tubing and its collar or collars when elevated and to be locked within the housing in the elevated position, and elements carried by the slips to raise them.

2. In a well appliance, a set of pipe slips, and a supporting body surrounding said slips, said body being provided with undercut shoulders and each slip being cut away at its rear to permit interfitting and there provided with resilient means for separately withdrawing and retaining the same in an elevated position when a load is taken therefrom.

3. In a well appliance, a set of pipe slips, and a supporting body surrounding said slips, said slips and said body being respectively provided with inclined and undercut shoulders capable of interfitting to permit rapid retraction and to limit the upward movement of said slips.

4. In a well appliance, a set of pipe slips, a supporting body surrounding said slips, and moving means comprising a depressing ring engaging said slips and movable by means of a foot lever pivoted to said body and connected to said depressing ring by links.

5. In a well appliance, a set of pipe slips, means for elevating the same when released, a supporting body surrounding said slips, and means comprising a single lever pivoted to said body and connections from said lever to said slips for simultaneously depressing said slips.

6. In a device of the character described, a housing having an interior inclined engaging face, said housing being provided upon such engaging face with a recess, the bottom wall of the recess being positioned outwardly of the engaging face, and a slip operating within the housing and having a lateral projection, said projection being adapted for over-running slidable engage-

ment with the inclined face for producing a wedging action and also adapted to move off of said engaging face and to enter said recess, when the slip is moved longitudinally in one direction.

7. In a device of the character described, a housing having inclined interior faces provided with recesses producing end portions, slips slidable within the housing and having inclined exterior faces provided with recesses forming end portions, the end portions of the housing being adapted to enter the recesses of the slips and the end portions of the slips to enter the recesses of the housing.

8. A device of the character described, comprising a housing having an inclined wall provided with a recess spaced from its upper end, a slip having a co-acting inclined wall and provided with a recess spaced from the lower end of the slip, said inclined walls being adapted for slidable engagement and the recesses producing interlocking parts which are adapted to enter said recesses.

9. A housing having an inclined wall, a slip within the housing having an inclined wall, said inclined walls being adapted for slidable engagement, said engaging walls embodying spaced engaging elements having recesses between them, said enaging elements being adapted to enter said recesses.

10. In a device of the character described, a housing provided upon its inner side with spaced lateral projections constituting inclined walls, a slip operating within the housing and having spaced lateral projections constituting inclined walls, the projections of the housing and slip being adapted for over riding slidable engagement, and one projection of the housing being adapted to enter the recess between the projections of the slip and one projection of the slip being adapted to enter the recess between the projections of the housing.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 28th day of March, 1924.

AUGUST L. SEGELHORST.