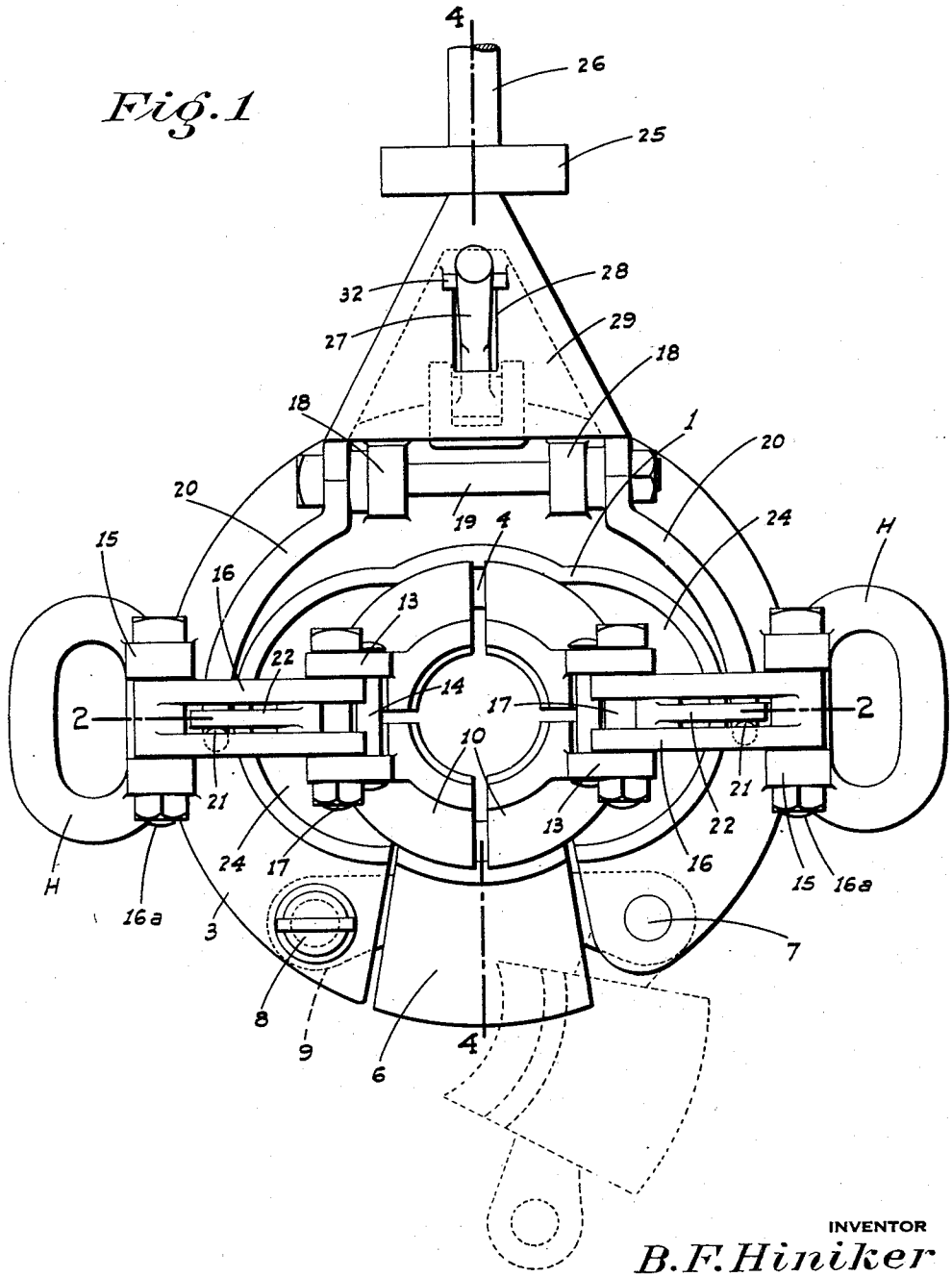
Dec. 8, 1936. B. F. HINIKER 2,063,378

OIL WELL SPIDER

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Fig. 1



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Fig. 2

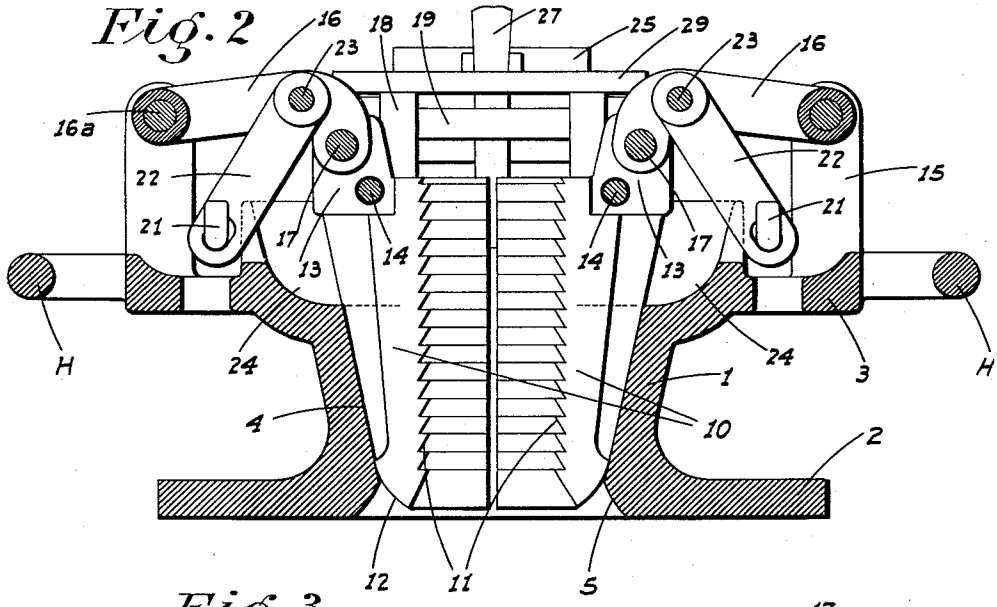
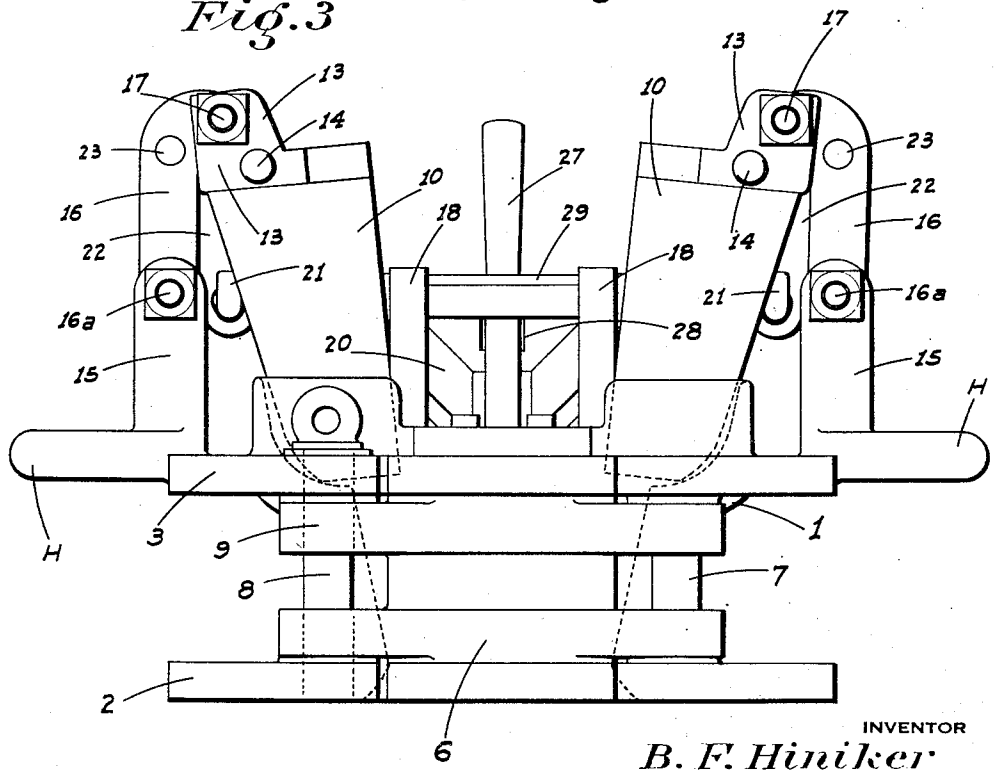


Fig. 3



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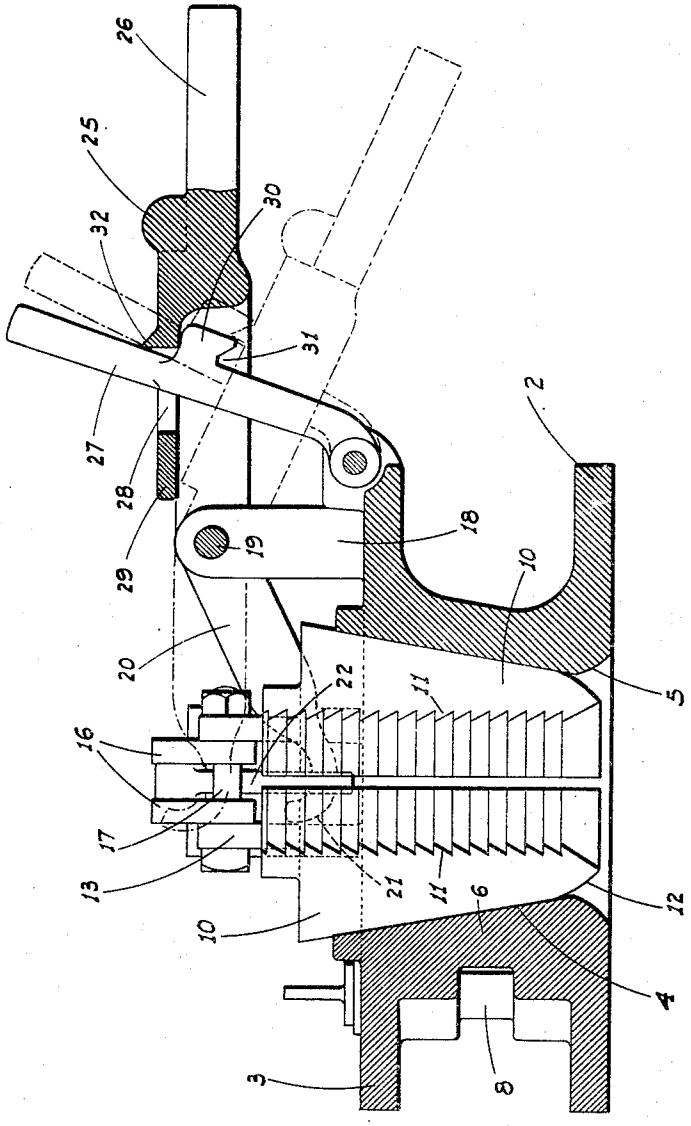


Fig. 4

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OIL WELL SPIDER

Benjamin Franklin Hiniker, Taft, Calif.

Application March 23, 1935, Serial No. 12,645

5 Claims. (Cl. 24—263)

This invention relates to pipe and rod spiders such as are used in connection with well drilling operations, and particularly represents improvements over the structure shown in my Patent No. 1,566,006 as well as other preceding patents.

The principal object of my present invention is to provide a device of this character having an improved simplified and more compact mechanism for raising and lowering the slips and which may be operated from adjacent the spider or from a point horizontally remote from the same, as operating conditions sometimes require.

Another object is to provide a simple form of holding catch to both prevent lowering of the slips when they have been raised and spread and also undesired raising of the slips when they have been lowered to their operating position.

A further object is to provide a slip structure arranged in the form of four substantially 90° segments; the adjacent segments being flexibly connected as a pair for raising and lowering as a unit, without interfering with limited independent movement of each slip as is necessary to insure best engagement of the slip with the pipe or rod.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a top plan view of my improved spider showing the slips lowered.

Figure 2 is a sectional elevation on the line 2—2 of Figure 1.

Figure 3 is a front view of the spider showing the slips raised.

Figure 4 is a transverse section of the device on the line 4—4 of Figure 1.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes the body of the spider, preferably a circular member, provided with a relatively large base flange 2 which may be circular as shown or rectangular for engagement with a rotary table if desired. The body also has an outwardly projecting relatively wide top flange 3, from the opposite sides of which rigid handles H project outwardly.

Formed in the body is the slip engaging bore 4, which tapers down to adjacent the bottom of the body where it is formed with a relatively sharp outward flare as at 5. The front of the body, including the top and bottom flanges, is cut away to the bore to form a vertical pipe passage, which passage is normally closed by a gate 6. This gate is substantially of segmental form and is hinged on the body on one side by a vertical pin 7 and on the other side is releasably engaged by a vertical latch pin 8, projecting through the body flanges and through lugs 9 on the door. The inner face of the door follows the curvature and slope of the bore 4 so as to complete the same in continuous circular form when the door is closed.

The pipe or rod engaging slips are in the form of substantially 90° segments 10, having vertically spaced gripping teeth 11 as usual about their bore. The outer surface of the slips follows the taper of the bore 4 except adjacent the bottom, where the slip taper has a somewhat abrupt inward flare, as shown at 12.

Vertical and parallel ears 13 project upwardly from the slips on the opposite sides of the body, each adjacent pair of ears being loosely connected near the bottom by a cross pin 14, so that while said slips cannot be actually separated they may have a certain amount of play relative to each other. Upstanding from the upper body flange outwardly of and symmetrically arranged relative to the ears 13 are posts 15, between which the adjacent ends of arms 16 project and to which they are pivoted by cross pins 16a. These arms are in pairs integrally connected at their post end and extend from between the posts to terminations between the ears 13 above the pins 14, being pivotally connected to the ears by cross pins 17.

Upstanding from the flange 3 behind the slips and symmetrically disposed relative to the transverse axis of the body are other posts 18. These serve as the supports for the intermediate pivot bolt 19 of a substantially horizontal Y-shaped actuating lever 20. The separated ends of this lever curve outwardly from the posts 18 in convex relation to each other and extend to terminations under the arms 16 just inwardly of the posts 15. At such terminations the lever ends are formed with upwardly facing hook elements 21 which freely and swivelly engage links 22 at their lower end. These links extend upwardly from the hooks and project between the corresponding pairs of arms 16 to which they are pivoted by cross pins 23, disposed between the pins 16a and 17. Said pins 23 are relatively close to the pins

17 so that when the slips are lowered the opposed links have an upward slant toward each other.

It will therefore be seen that when the outer end of the lever is depressed from the position occupied when the slips are lowered, the links 22 will be pushed up, and arms 16 swinging upwardly and outwardly about the pins 16a as an axis. This causes the opposed pairs of slips to be raised and at the same time to be separated as they move up the taper of the bore 4. After a certain amount of upward movement of the slips has taken place the lower ends of the opposed pairs of slips clear the bore 4 and enter pockets or cups 24 formed in opposed relation in the body on opposite sides of said bore. This construction causes a rapid separating movement of the slips to take place with but little vertical movement of the same; the arms 16 then reaching their limit of upward movement. The opposed pairs of slips are then separated at their adjacent edges a distance approximately equal to the width of the gate, so that no interference of any kind with the entrance of a pipe into or out of the slips through the gate opening is had.

The outer portion of the lever 20, beyond the pivot bolt 19, is provided with a cross bar 25 on top for engagement with the foot, and outwardly of said bar the lever is formed as a circular centrally disposed extension 26 adapted to fit in the end of a length of pipe or the like. This enables the lever to be operated from a distance as when the spider and parts in the vicinity are being sprayed with oil as sometimes occurs.

Pivoted on the body 1 behind and at the base of the posts 18 is a catch arm 27 which projects upwardly with a backward slope through a slot 28 in a cross plate 29 forming a part of the adjacent portion of the lever 20 in front of the cross bar 25. Intermediate its ends this catch arm is formed with a rearwardly projecting lug 30 having a downwardly facing notch 31 in its under side. This notch when the lever is almost fully depressed and when the slips are in the pockets 24 is adapted to automatically engage a transverse upstanding rib 32 formed on the plate 29 across the rear face of the slot. The catch can then only be released by further depressing the lever sufficient for the rib to clear the notch, and drawing the catch arm forwardly. The lever is then released, whereupon the slips drop readily into position in the body bore of themselves and due to their weight. The chamfer or flare 12 on the bottom of the slips aids this movement and prevents them from possibly hanging up in the cups. When the slips are fully lowered the lug 30 on the catch arm drops under the plate 29 at the rear end of the slot, preventing the upward movement of the slips.

The bottom flare 5 of the bore 4 prevents any collar on the string of pipe or rod from possibly catching on the body as the string is being pulled. The use of the particular form of gate as described and shown assures a proper and even pressure against the slips throughout their area. The gate also strengthens the body, preventing possible fracture of the same across the back, without having to use an excessive amount of metal in this zone.

The cooperating taper of the bore and slips is designed so as to permit of easy release of the slips; while the abrupt taper at the bottom causes the pipe to center itself.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A pipe holding spider comprising a body having a vertical bore, separate pipe engaging slip units slidably engaging the bore, posts upstanding from the body outwardly of the slip units, arm extending between and pivotally connected to the posts and units, said arms being substantially horizontal when the slips are lowered, links pivoted on the arms intermediate their ends and depending therefrom, and a rearwardly projecting lever pivoted intermediate its ends on the body rearwardly of the slip units and having horizontally spaced branches connected to the links at their lower end.

2. A pipe holding spider comprising a body having a vertical bore, pipe engaging slips slidably engaging the bore, means to raise and lower the slips including a lever pivoted intermediate its ends on and projecting from one side of the body, and releasable catch means between the body and lever and automatically engaging the lever when depressed to hold the same against retractive movement, and also automatically engaging said lever when retracted to hold the same against depressing movement.

3. A pipe holding spider comprising a body having a vertical bore, pipe engaging slips slidably engaging the bore, means to raise and lower the slips including a lever pivoted intermediate its ends on and projecting from one side of the body, said lever having a substantially horizontal position which includes a plate slotted lengthwise of the lever, a catch arm pivoted on the body below said plate and projecting upwardly through the slot with a rearward slant whereby it will rest of its own weight against one end of the slot, a lug on the arm projecting under the plate beyond the slot when the outer portion of the lever is raised whereby the top of the lug then forms a stop preventing depression of the lever, the bottom of the lug having a notch, and an element upstanding from the plate at said end of the slot to enter the notch when the catch arm has been released from the first named holding position and the lever is depressed a predetermined amount.

4. A pipe holding spider comprising a body having a vertical bore, separate pipe engaging slip units slidably engaging the bore, posts upstanding from the body outwardly of the slip units, arm units pivoted on the posts and extending toward the slip units, said arm units being substantially horizontal when the slips are lowered and terminating in down turned portions overhanging the slips, ears projecting upwardly from the slips on which the lower ends of said downturned portions are pivoted, links pivoted on the arm units adjacent said down turned portions and depending therefrom between the slips and posts, and a rearwardly projecting lever pivoted intermediate its ends on the body rearwardly of the slip units and having horizontally spaced elements swivelly connected to the links at their lower end.

5. A pipe holding spider comprising a body having a vertical bore, separate pipe engaging slip

units slidably engaging the bore, posts upstanding from the body outwardly of the slip units, arm units pivoted on the posts and extending toward the slip units, said arm units being substantially horizontal when the slips are lowered and terminating in down turned portions overhanging the slips, ears projecting upwardly from the slips on which the lower ends of said down turned portions are pivoted, each arm unit comprising a pair of spaced arms, links extending between and pivoted on the arms adjacent said down turned portions and depending therefrom between the slips and posts, and a rearwardly projecting lever having horizontally spaced elements swivelly connected to the links at their lower end; the opposed exterior surfaces of the slips being vertically slotted to accommodate the adjacent portions of the links when the arm units are raised to a substantially vertical position.

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