

May 20, 1924.

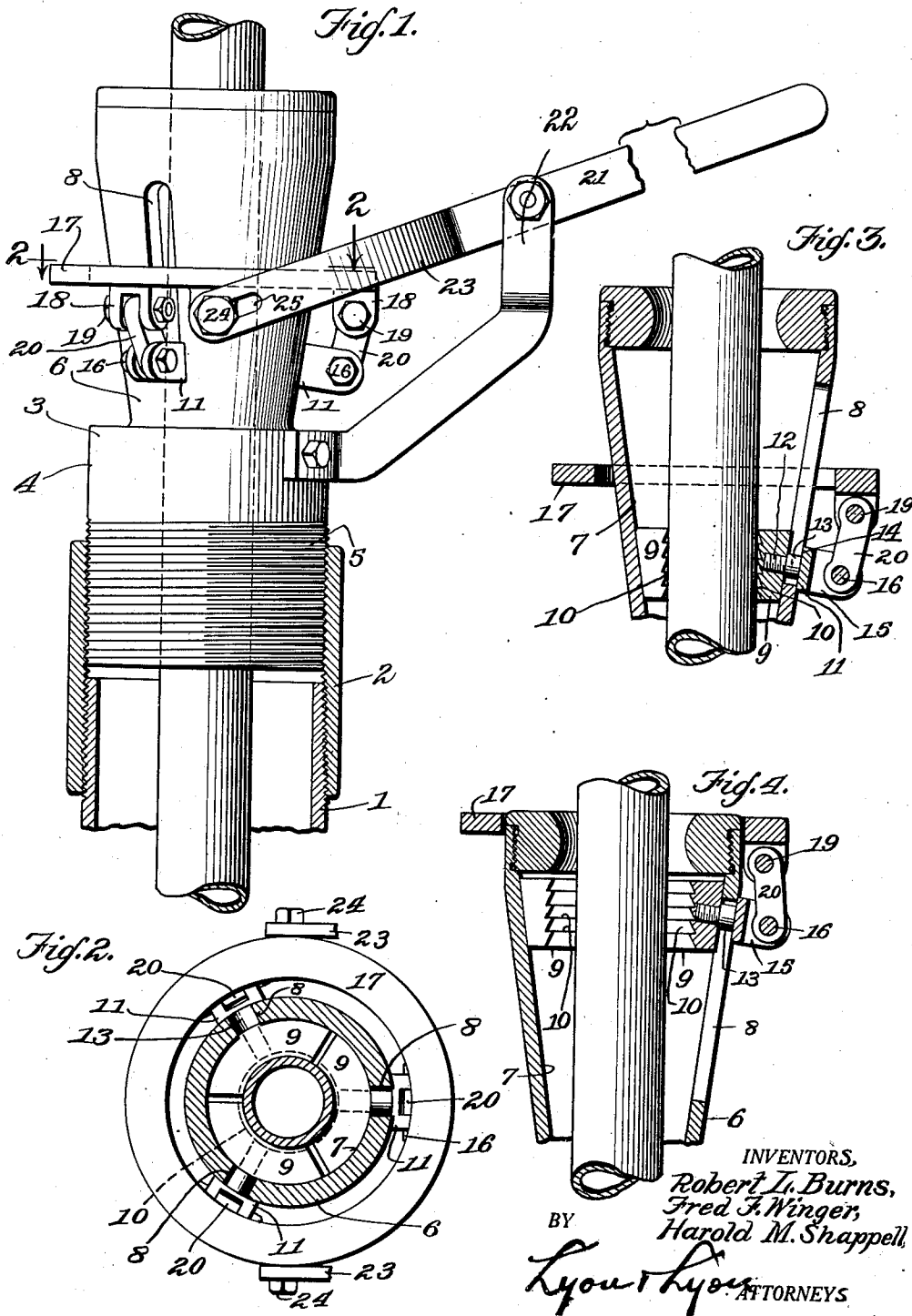
R. L. BURNS ET AL

1,494,585

SAFETY PIPE HOLDER

Filed May 31, 1923

2 Sheets-Sheet 1



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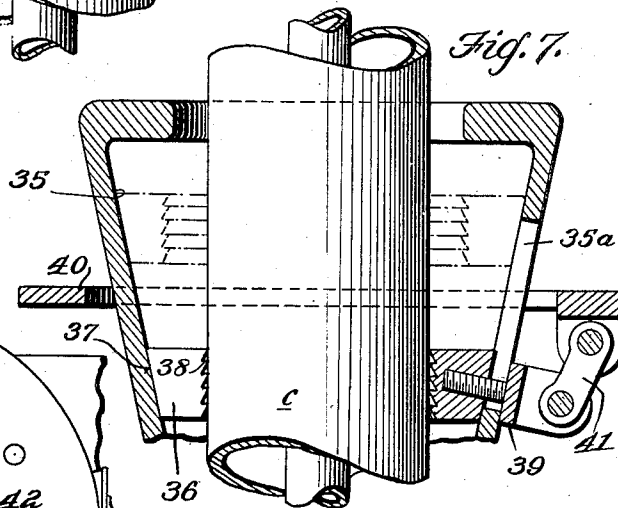
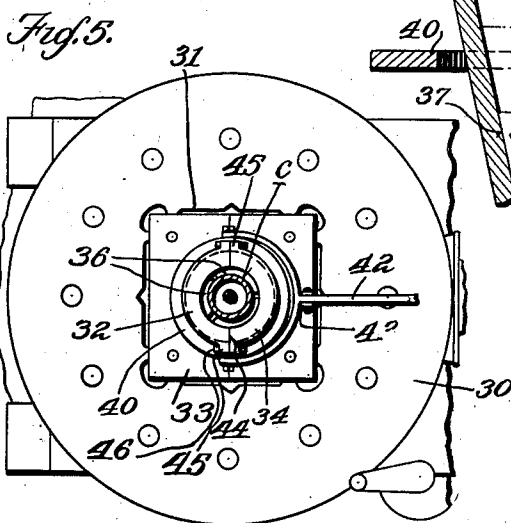
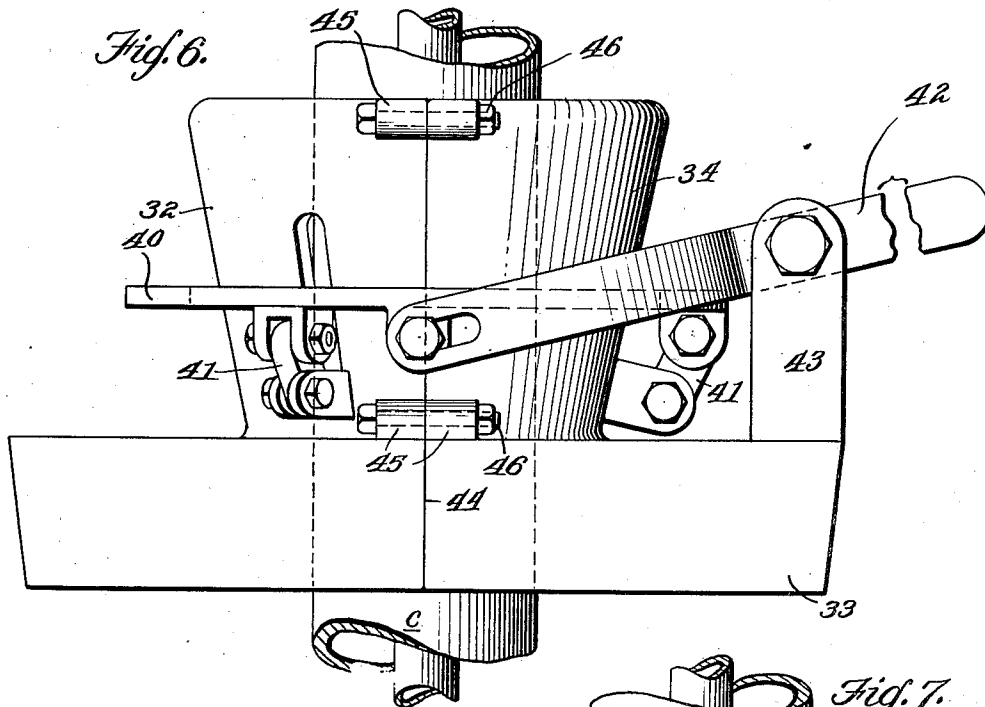
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SAFETY PIPE HOLDER

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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SAFETY PIPE HOLDER.

Application filed May 31, 1923. Serial No. 642,517.

To all whom it may concern:

Be it known that we, ROBERT L. BURNS, FRED F. WINGER, and HAROLD M. SHAPPELL, citizens of the United States, residing at Taft, in the county of Kern and State of California, have invented a new and useful Safety Pipe Holder, of which the following is a specification.

This invention relates to a device or safety holder for catching drill pipe, tubing, etc., during the raising or lowering of the same in a well.

The present customary oilfield practice when inserting or removing drill pipe, casing or tubing from a well is to use either two elevators, or one elevator and a spider and slips. The elevator is attached to the drill pipe, casing or tubing and is employed to raise or lower the same. A second elevator is sometimes used so that while the casing, drill pipe or tubing is held by the first elevator, the second elevator may be engaged with the tubing to raise or lower the same.

In place of two elevators, one elevator is sometimes employed and a spider and slips employed to support the pipe in the well until the traveling elevator may be changed from one position to another on the pipe. Either of these methods require considerable time for operation and frequently result in injuries to the workmen since careful cooperation among the workmen is necessary when manipulating the different elevators, spiders or slips.

An object of this invention is to decrease the amount of time and labor hitherto necessary to raise or lower drill pipe, casing or tubing, and to eliminate most of the hazards and dangers heretofore encountered when raising or lowering the same.

More specifically one of the objects of this invention is to provide a safety holder with slips adapted to engage drill pipe, casing or tubing, which slips are automatically operated and may be held in position to at any time catch and hold the pipe, casing or tubing which is being raised or lowered, as the slips may be readily dropped into position at any time during the lowering process to hold the pipe, casing or tubing, and prevent the string from dropping into the well, and during the process of raising pipe from the well, its action is automatic.

Another object of this invention is to provide a safety holder which may cooperate with the customary rotary table employed in oilwell drilling and replace the customary hand operated slips to facilitate the handling of the drill pipe or well casing and render the handling of such drill pipe or casing more rapid and safe than has heretofore been possible.

Another object of this invention is to provide a safety holder with slidable slips which operate in unison and are supported upon an upwardly and outwardly expanded surface during the extent of their travel so that in any position of the slip members, the same are adequately supported and adapted to withstand a relatively heavy load.

Another object of this invention is to provide a safety holder with a body having an outwardly and upwardly expanding inner surface with vertically extending slots adjacent the surface so that slip members may be slidably mounted on the expanding surface by means of guides connected to the slip members through the slots.

Various other objects and advantages of this invention will be apparent from the description hereinafter contained and will present themselves in the practice of the invention. The accompanying drawings illustrate the preferred form or embodiment of the invention.

In the drawings:

Figure 1 is an elevation of one embodiment of the invention.

Fig. 2 is a section on the line 2-2 of Figure 1 with the lever employed to actuate the slips broken away.

Fig. 3 is a longitudinal fragmentary section of the expanding portion of the body illustrating the slips in the engaging position.

Fig. 4 is a view similar to Figure 3 with the slips in the non-engaging position.

Fig. 5 is a plan view of a modified form of the invention.

Fig. 6 is an elevation of the pipe holding mechanism employed therewith.

Fig. 7 is a longitudinal section of the expanding portion of the body showing the slips in the engaging position.

Referring first to Figures 1 to 4 of the drawings, the safety holder shown in the

form for handling well casing or tubing which safety holder is intended to be inserted or fitted to the top of a casing previously installed in the well.

5 In the drawing 1 represents a casing installed in a well (not shown) and 2 indicates a collar secured to the upper end of the casing. The safety holder proper comprises a body 3 having a cylindrical base
10 portion 4 which is threaded as indicated at 5 to fit the collar 2 of the well casing 1. Above the base portion 4, the body 3 is contracted as indicated at 6 and expands outwardly and upwardly therefrom. The
15 upper portion of the body is provided with an inner surface 7 expanding outwardly and upwardly corresponding to the outer surface of the body and said upper portion is provided with a number of vertical-
20 ly extending slots 8 which are preferably spaced at equal intervals around the upper portion. In the embodiment shown in Figures 1 to 4 three of said slots are provided.

25 Within the upper portion of the body 3 of the holder are positioned a number of segmental slip members 9, the outer surface of which are tapered to correspond with the surface 7 of the body 3 and the inner surface of each slip member is provided with
30 upwardly directed arcuate teeth 10, the curvature of the teeth preferably being substantially equal to the curvature of the pipe or tubing the safety holder is designed to
35 catch.

Each of said slips is provided with a guide member 11 which may be screwed thereto as indicated at 12. Said members 11 are provided with a section 13 which fits the
40 slots 8 of the body. Said portions 13 are preferably equal in width to the width of the upper expanding portion of the body 3. The guide members 11 are enlarged exterior of the body to define a shoulder 14
45 which engages the outer surface of the body 3 adjacent the slots 8 to hold the slip members 9 against the inner surface 7 of the body so that said slip members may be translated only in the direction parallel to
50 the surface 7 of the body. Said guide members 11 are further provided with outwardly extending ears 15 in which a pin 16 is supported.

17 indicates a control member in form of
55 a ring plate which is provided with downwardly projecting bifurcations 18 adjacent each guide member 11 which bifurcations 18 support a pin 19. Each guide member 11 is supported from the control member
60 17 by means of links 20 which are journaled at their ends to the pins 19 and 16. To operate the control member 17 an operating lever 21 is provided, which lever 21 is pivotally supported intermediate its
ends on an arm 22. Said operating lever

21 is provided with a forked end 23 which fits over the control member 17 and engages studs 24 supported at opposite sides by said control member 17. Said forked arms 23 have longitudinal slideways 25 to permit an
70 arcuate movement of the forked ends 23 to vertically translate the control member 17.

The arm 22 is preferably bolted or otherwise secured to the base 4 of the body 3.

Referring to Figures 5 to 7 inclusive a
75 form of the invention is illustrated which combines with the customary rotary table employed in drilling wells, a safety holder which may replace the customary slips employed therewith. Referring to the draw-
80 ings, 30 generally indicates a rotary table which may be any customary or preferred form, the construction of which tables is well known in the art. Such tables are generally provided with a substantially
85 square opening 31 concentric with the table in which the customary "master" bushing is inserted. The safety holder of this modification comprises a body 32 which is provided with a square base 33 comple-
90 mentary in size to the customary square opening 31 of the rotary table 30, and in use said base 33 is inserted into said opening 31 and supports the pipe holder therein.

The upper portion 34 of the body ex-
95 pands outwardly and upwardly with the inner surface 35 expanding in a manner corresponding to the outer surface of the body. Said portion 34 is provided with upwardly extending slots 35a
100 spaced equidistant around the upper portion, there being three of such slots in the embodiment shown. Segmental slip members 36 are positioned within the portion
105 34 of the body and are provided with outer surfaces 37 tapered corresponding to the inner surface 35 of the body and with their inner surface formed with upwardly directed teeth 38 which are preferably arc-
110 uated to correspond with the pipe or other tubing which is intended to be held by the device. Said slip members 36 are secured to guide members 39 complementary to the members 11 of the previous form which are
115 secured to a controlling member 40 preferably in a similar manner by links 41. A lever 42 is provided to operate the slips. Said lever is preferably pivotally supported on an arm 43 integral with the base portion
120 33 of the body.

To facilitate the positioning of the safety holder within the rotary table when a casing (such as c) is extending therethrough, the body 32 of the holder may be vertically split as indicated at 44 in the drawings, in which
125 case the separate portions may be provided with corresponding lugs 45 through which bolts 46 are passed to maintain the split sections together during operation of the device.

The safety holders thus described may be used in various operations. The weight of the control members 17 or 40, slip members 9 or 36 and other parts is sufficient to automatically cause the slip members 9 or 36 to move to the engaging position. When it is desired to move a pipe or tubing through the holder the free end of the operating lever 21 is forced downward which moves the control members 17 or 40 upwardly which in turn causes the slip members 9 or 36 to move upwardly in unison and disengage from the tubing or pipe. Preferably the safety holder is positioned so this operation may be controlled by a foot action. The safety holder is thus in position while the pipe or casing is being lowered or raised therethrough to be instantly engaged with the casing by simply releasing the free end of the lever 21 or 42.

By this invention the employment of manually operated slips and spiders or the employment of two elevators may be eliminated in raising or lowering drill pipe casing or tubing and the casing or tubing more rapidly handled with less hazard than in the customary manner. The slip members being mounted upon upwardly and outwardly expanding surfaces may engage casings of varying sizes or may engage the collars of the casing being lowered or raised therethrough, if preferred.

While the embodiments of the invention herein described are well suited for the purpose of this invention, this invention is not limited to the specific embodiment shown, but the same may be modified in various manners without departing from the spirit of the invention. This invention is of the scope set forth in the accompanying claims.

We claim:

1. A safety holder, comprising a body having an upwardly and outwardly expanding inner surface, slip members slidably mounted on said surface, means for positively holding said slip members engaging said surface throughout their travel, and means for actuating the slips in unison.

2. A safety holder, comprising a body having an upwardly and outwardly expanding surface and vertically extending slots, slip members slidably mounted on said surface, guide members secured to said slips and slidably fitting said slots, said guide members having shoulders engaging the body retaining the slips against the body during their travel, and means cooperat-

ing with the guide members to actuate the slips in unison.

3. A safety holder comprising a body having an upwardly and outwardly expanding surface, said body having vertically extending slots, slip members slidably mounted on said surface, and guide members slidably fitting said slots, a control member for positively holding said slip members engaging said expanding surface, and links connecting said guide members to said control member, and means for vertically translating said control member.

4. In a safety holder, the combination with a body having an outwardly and upwardly tapered surface, of a plurality of slip members slidably mounted thereon, means connecting the slips, means for positively holding the slips against said surface, and means cooperating with said connecting means to translate said slips in a direction following the angle of taper of the said surface.

5. In a safety holder, the combination of a pivotally mounted lever, a control member secured to said lever, a body, slip members mounted to move upwardly and outwardly on said body, means for positively holding the slip members engaging the body, and links connecting said slips to said control member.

6. The combination of a body having an upwardly and outwardly expanding surface, slip members slidably mounted on said surface, means positively retaining said slips against said surface throughout their travel, a control member, links connecting said slips to said control member, and a pivotally mounted lever engaging said control member to actuate said slip members.

7. In a device of the class described, the combination of a rotary table, means supported by said table forming an outwardly and upwardly expanding surface, slip members mounted to slide on said surface, means positively retaining said slip members engaging said surface throughout their travel, means interconnecting said slip members, and means cooperating with said interconnecting means to translate the slips in unison to various positions on said expanding surface.

Signed at Taft, California, this 18th day of May, 1923.

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