Oct. 27, 1942. C. LOWERY 2,300,370

SUCKER ROD ELEVATOR

Filed July 9, 1941 2 Sheets-Sheet 1

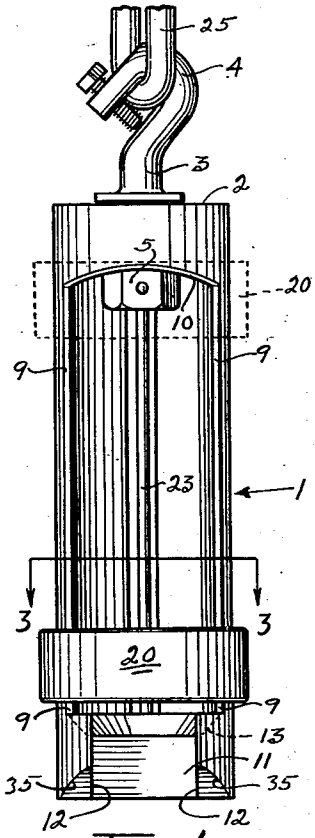


Fig. 1

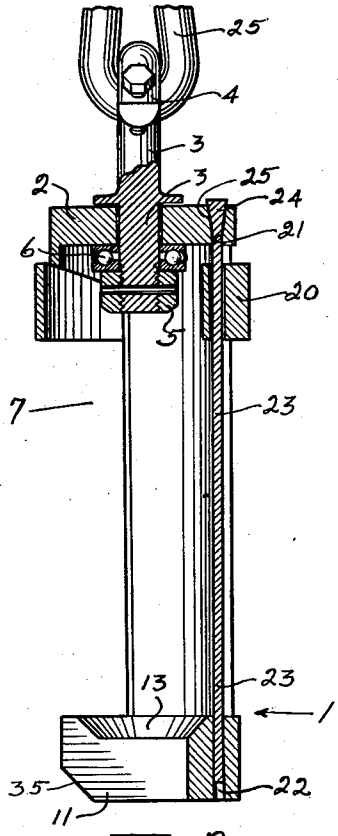


Fig. 2

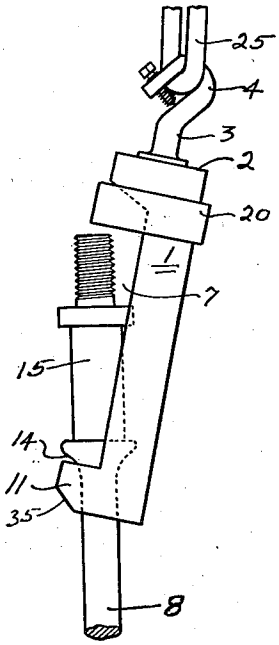


Fig. 4

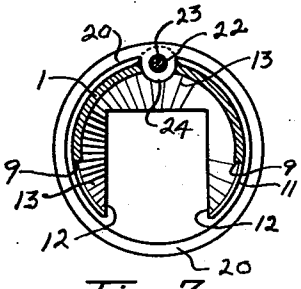


Fig. 3

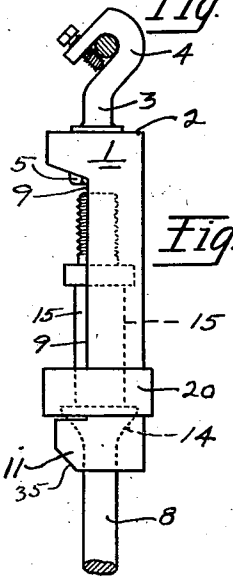


Fig. 5

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SUCKER ROD ELEVATOR

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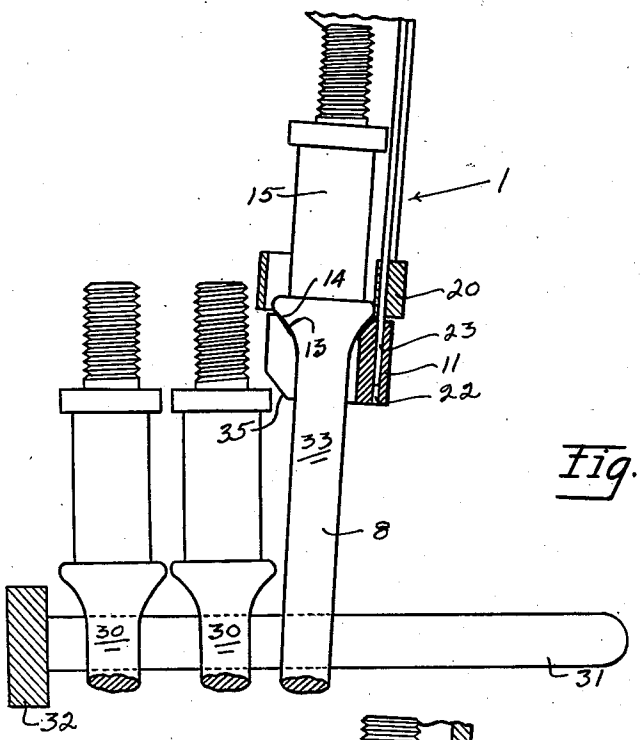


Fig. 6

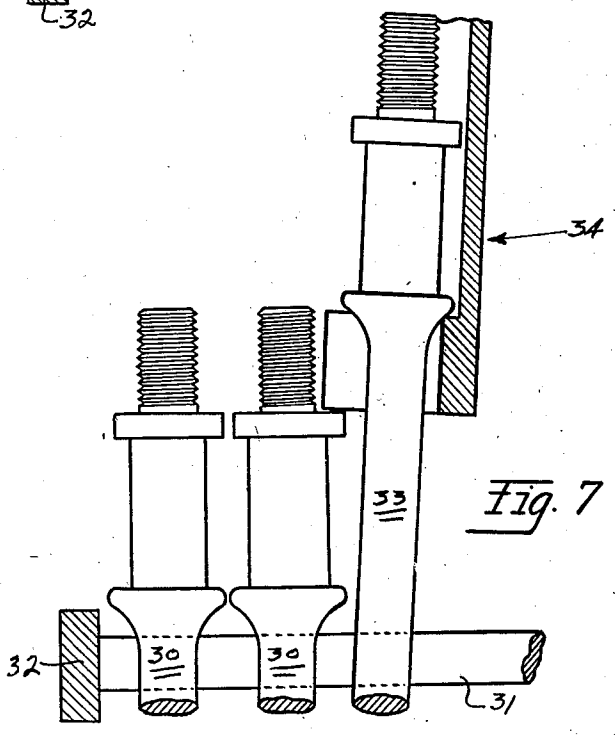


Fig. 7

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SUCKER ROD ELEVATOR

Charley Lowery, Oklahoma City, Okla.

Application July 9, 1941, Serial No. 401,613

10 Claims. (Cl. 294—91)

The invention relates to mechanism for handling oil well sucker rods, and more particularly to mechanism commonly known in the art as a "transfer elevator."

Usual oil well pump rods, or "sucker rods" as they are commonly called in the field, are provided at the ends of each section with an enlargement which makes possible the provision of either an externally threaded "pin" or an internally threaded "box." In either event, the adjacent ends of the enlargements of each rod section terminate in an exterior conically tapered portion, and this conical portion is commonly used as a means beneath which to engage the section with an elevator for raising and lowering the rod section, or otherwise handling the section in the well and derrick.

The present invention consists of a tool adapted to be suspended by a traveling cable, and to be engaged beneath the above described conical shoulder of a sucker rod section for handling the same in a well derrick.

One object of the invention is the provision of a sucker rod elevator which includes a safety mechanism positively preventing the sucker rod from being inadvertently released or dropped while engaged in the elevator.

Another object is the arrangement of parts whereby the safety device acts, through gravitation, to normally remain in its protective or latched position.

A further object is the design of a tool of this class which will function properly even though the device becomes coated with paraffin or other viscid material.

Another object is the assembly of moving parts in such manner that they may be easily and quickly removed and replaced when broken or worn.

Yet another object is the provision of a seating surface for the rod section which will automatically center the rod in the tool.

A still further object is the provision of a tool of this class which is so designed that it will not foul with "stands" of sucker rod previously racked vertically in the derrick.

Other objects of the invention are to accomplish; ease of operation; simplicity in design; economical manufacturing expense; and, durability.

In the drawings:

Figure 1 is a front elevational view;

Figure 2 is an elevational sectional view through the device of Figure 1, but showing the safety collar at the upper end of its throw;

Figure 3 is a horizontal sectional view taken substantially along the line 3—3 of Figure 1;

Figure 4 is a side elevational view illustrating the tool being engaged around the upper end of a usual sucker rod section;

Figure 5 is a similar view of the device engaged about the rod section;

Figure 6 is an elevational view of the device as it is used in racking stands of sucker rod sections; and,

Figure 7 is a similar view illustrating a common difficulty encountered in racking pipe when most of the present rod elevators are used.

Like characters of reference designate like parts where they appear in all of the figures.

In the accompanying two-sheet drawings, the reference numeral 1 indicates as a whole a hollow substantially cylindrical body having a closed upper end 2 which is centrally perforated to receive the shank portion 3 of a suitable supporting hook 4. The lower end of the shank 3 is externally threaded to receive a nut 5, and between the nether surface of the body end 2 and the upper surface of the nut 5 there is provided a suitable thrust bearing 6.

One side of the wall of the body 1 is cut away or removed to provide an entry opening 7 for the end portion of a usual sucker rod section 8. The shape of this opening may be best understood by reference to Figure 1 of the drawings wherein it is illustrated as being bounded by parallel vertical side edges 9 and a substantially horizontal top edge 10.

The body 1 is provided at its lower end with a heavy floor 11 having a substantially square notch 12 cut into one side edge. The open part or mouth of the notch 12 coincides with the side opening of the body but the notch is smaller in dimension than body opening 7. The notch 12 is barely wide enough to permit the passage thereinto of the sucker rod section 8. The upper surface of the floor 11 is counter-sunk as shown to provide a conical seat 13 adapted to receive a conically tapered portion or shoulder 14 of a sucker rod head 15 which is integral with the rod section 8. The tapered seat 13 acts to center the rod within the body 1 when the rod is being suspended therein.

As a means for positively maintaining the rod section within the body 1 during handling thereof, and annular sleeve 20 is provided around the body 1 and the sleeve is adapted for vertical sliding movement lonigtudinally of the body. In order to mount the sleeve 20 in operative position, the top 2 and floor 11 are provided with

vertical aligned perforations 21 and 22, as best seen in Figure 2, and the portion of the wall of the body 1 which lies between the perforations 21 and 22 is removed to permit the insertion of a guide pin 23 into the perforations. The pin 23 has a tapered portion 24 adjacent its upper end, and this tapered portion is adapted to be driven into a similarly shaped socket 25 in the top 2 of the body. The pin may be removed by driving it upwardly with a nail or punch. As best illustrated in Figure 3 the sleeve 20 is provided with an inwardly off-set bearing sleeve portion 24 having a bore adapted to surround the pin 23 and closely slide thereon. The inside diameter of the sleeve 20 is sufficiently great to entirely clear the outside surface of the body 1, and consequently ample space is left between the two to accommodate a reasonable amount of accumulated paraffin or other substance on the outside of the body, without preventing free vertical movement of the sleeve 20.

In engaging the body 1 with the sucker rod head, the sleeve 20 is first manually raised to the upper end of body, as illustrated in Figure 4. After the floor or bottom 11 has been hooked beneath the conical shoulder 14 of the rod head 15, the sleeve is released and falls to the position shown in Figures 1 and 5 where it prevents removal of the rod until again manually raised. When the body 1 is raised in a usual manner by movement of a cable 25 connected in the hook 4, the tapered seat 13 acts to center the rod in the body.

It is common practice in oil well operation to "rack" sucker rod "stands" of two or more sections each upright in the well derrick side by side as they are withdrawn from the well and are disconnected from the sucker rod string. For this purpose, spaced parallel fingers are rigidly positioned horizontally in the upper portion of the derrick, and these fingers each act simultaneously as a leaning support for the upper ends of several of the rod string "stands."

In Figure 7 is illustrated the upper ends of two sucker rod "stands" 30 which are shown positioned side by side and leaning against a usual horizontal finger 31 rigidly carried by a horizontal member 32 connected to the derrick. Figure 7 further illustrates a third "stand" 33 being supported by a usual rod elevator 34. The "stand" 33 has been swung over against the adjacent "stand" 30 and is being set down as close as possible to the "stand" 30. It will be noted that the lower end of the elevator 34 has fouled with the head of the adjacent "stand" 30, and in the position illustrated, the "stand" 33 cannot be further lowered to a position level with those "stands" which have been previously racked.

The above described "fouling" of the elevator 34 with the adjacent "stand" of racked sucker rod, is the "rule" rather than the "exception" when most of the present rod elevators are in use, and when such an occasion occurs, it becomes necessary to again raise the "stand" 33, swing the elevator clear of the adjacent "stand" 30, lower the elevator until the lower end of the "stand" 33 rests upon the derrick floor, and finally swing the elevator and "stand" over against the adjacent "stand" 30. This operation may at first hand sound simple and unimportant, but when it is considered that the operation requires unnecessary time of the man who is operating the hoisting mechanism, the man on the floor who is guiding the lower end of the "stand," and the man in the top of the derrick who is handling the upper end of the "stand," it becomes apparent that the operation is quite an expense, when extended over a long period of time and is multiplied by thousands of pumping wells. The hoisting mechanism must be started up each time merely for the purpose of raising the "stand" an inch or only a fraction thereof.

In order to eliminate this fouling of the bottom of the elevator with a pre-racked "stand" of sucker rod, I have bevelled the front edge of the floor 11 of my body 1 at each side of the notch 12. These bevelled portions are indicated by reference numerals 35. When my elevator is being used to rack rod "stands," the "stand" 33 is first swung over against the adjacent racked "stand" 30, and the elevator is lowered. When the bevelled portions 35 contact the head of the "stand" 30, the elevator is automatically thrust slightly outward by the bevels. The lowering movement is therefore not stopped until the "stand" 33 rests upon the derrick floor, after which the upper end of the "stand" 33 is merely pushed, by the derrick man over against the "stand" 30. No time is lost, and there can be no damage to the pre-racked rod "stands." Figure 6 illustrates the function of the bevelled portions 35 of the elevator.

It is thought that the operation of the present device is apparent from the foregoing description without further explanation.

I claim:

1. A sucker rod elevator comprising: an elongated hollow body having one open side for receiving the enlarged end of a usual sucker rod; a closure for the bottom end of said body having a side notch adapted to receive the portion of said rod which lies beneath said enlargement; a conical countersunk seat on the upper surface of said closure adjacent the notch for engaging beneath said enlargement and for centering the same in the body when the rod is supported thereby; an annular sleeve surrounding the body and logitudinally slidable thereon for retaining the sucker rod in the body when at the lower end of its throw; and a guide for the sleeve removably carried by the body.

2. A sucker rod elevator comprising: an elongated hollow body having one open side for receiving the enlarged end of a usual sucker rod; means for suspending said body by a line; a closure for the bottom end of said body having a side notch adapted to receive the portion of said rod which lies beneath said enlargement; a conical countersunk seat on the upper surface of said closure adjacent the notch for engaging beneath said enlargement and for centering the same in the body when the rod is supported thereby; an annular sleeve surrounding the body and longitudinally slidable thereon for retaining the sucker rod in the body when at the lower end of its throw; and a guide for the sleeve removably carried by the body.

3. A sucker rod elevator comprising; an elongated hollow body having one open side for receiving the enlarged end of a usual sucker rod section; means for suspending said body by a line; a closure for the bottom end of said body having a side notch adapted to receive the portion of said rod which lies beneath said enlargement; the lower surface of the closure being bevelled upwardly and outwardly at each side of the mouth of said notch to prevent the bottom of the closure from fouling with a flat horizontal surface.

4. A sucker rod elevator comprising: an elon-

gated hollow body having one open side for receiving the enlarged end of a usual sucker rod section; means for suspending said body by a line; a closure for the bottom end of said body having a side notch adapted to receive the portion of said rod which lies beneath said enlargement; the lower surface of the closure being bevelled upwardly and outwardly at each side of the mouth of said notch to prevent bottom of the closure from fouling with a flat horizontal surface; and a conical countersunk seat on the upper surface of said closure adjacent the notch for engaging beneath said enlargement and for centering the same in the body when the rod is supported thereby.

5. A sucker rod elevator comprising: an elongated hollow body having one open side for receiving the enlarged end of a usual sucker rod section; a closure for the bottom end of said body having a side notch adapted to receive the portion of said rod which lies beneath said enlargement, the upper surface of said closure being adapted to engage beneath said enlargement to support the rod; an annular collar surrounding and vertically slidable upon the body, said collar when at the lower end of its throw being adapted to confine the enlargement to a position within the body; and a guide for the sleeve removably carried by the body.

6. A sucker rod elevator comprising: an elongated hollow body having one open side for receiving the enlarged end of a usual sucker section; a closure for the bottom end of said body having a side notch adapted to receive the portion of said rod which lies beneath said enlargement, the upper surface of said closure being adapted to engage beneath said enlargement to support the rod; an annular collar surrounding the body; and means for mounting the collar to slide longitudinally on the body, said means restricting the collar against contact with the periphery of the body at more than one radial point at one time.

7. Organization as described in claim 6, in which the means includes: a pin extending longitudinally of the body in the plane of the wall thereof, said pin passing through a bearing sleeve carried by and off-set inwardly from the inner surface of said collar.

8. A sucker rod elevator comprising an elongated hollow body having one open side for receiving the enlarged end of a usual sucker rod section; means for suspending said body by a line; a closure for the bottom end of said body having a side notch adapted to receive the portion of said rod which lies beneath said enlargement; the lower surface of the closure being bevelled upwardly and outwardly at each side of the mouth of said notch to prevent the bottom of the closure from fouling with a flat horizontal surface; a conical countersunk seat on the upper surface of said closure adjacent the notch for centering the same in the body when the rod is supported thereby; an annular collar surrounding and vertically slidable upon the body; and, means for mounting the collar in said sliding relation to said body, said means including a pin extending longitudinally of the body in the plane of the wall thereof, and passing through a bearing sleeve carried by and off-set inwardly from the inner surface of said collar.

9. Organization as described in claim 6, in which the means includes: a pin extending longitudinally of the body in the plane of the wall thereof; a tapered head carried by the upper end of the pin; a similarly shaped socket in the body for receiving the head; and, in which the closure is provided with a through perforation for receiving the lower end of said pin whereby, the pin may be driven upwardly out of said socket.

10. A sucker rod elevator comprising: a hollow body having one open side for receiving the enlarged end of a usual sucker section; a closure for the bottom end of said body having a side notch adapted to receive the portion of said rod which lies beneath said enlargement, the upper surface of said closure being adapted to engage beneath said enlargement to support the rod; and an arcuate member spanning said open side; and removable guide means mounting said member to slide longitudinally along the body, said means being arranged to hold the member spaced from the body along at least one radial point.

CHARLEY LOWERY.