Nov. 15, 1938. W. C. TROUT 2,136,480

SAFETY COUPLER CONNECTION FOR OIL WELL PUMPING POWERS

Original Filed May 26, 1935 2 Sheets-Sheet 1

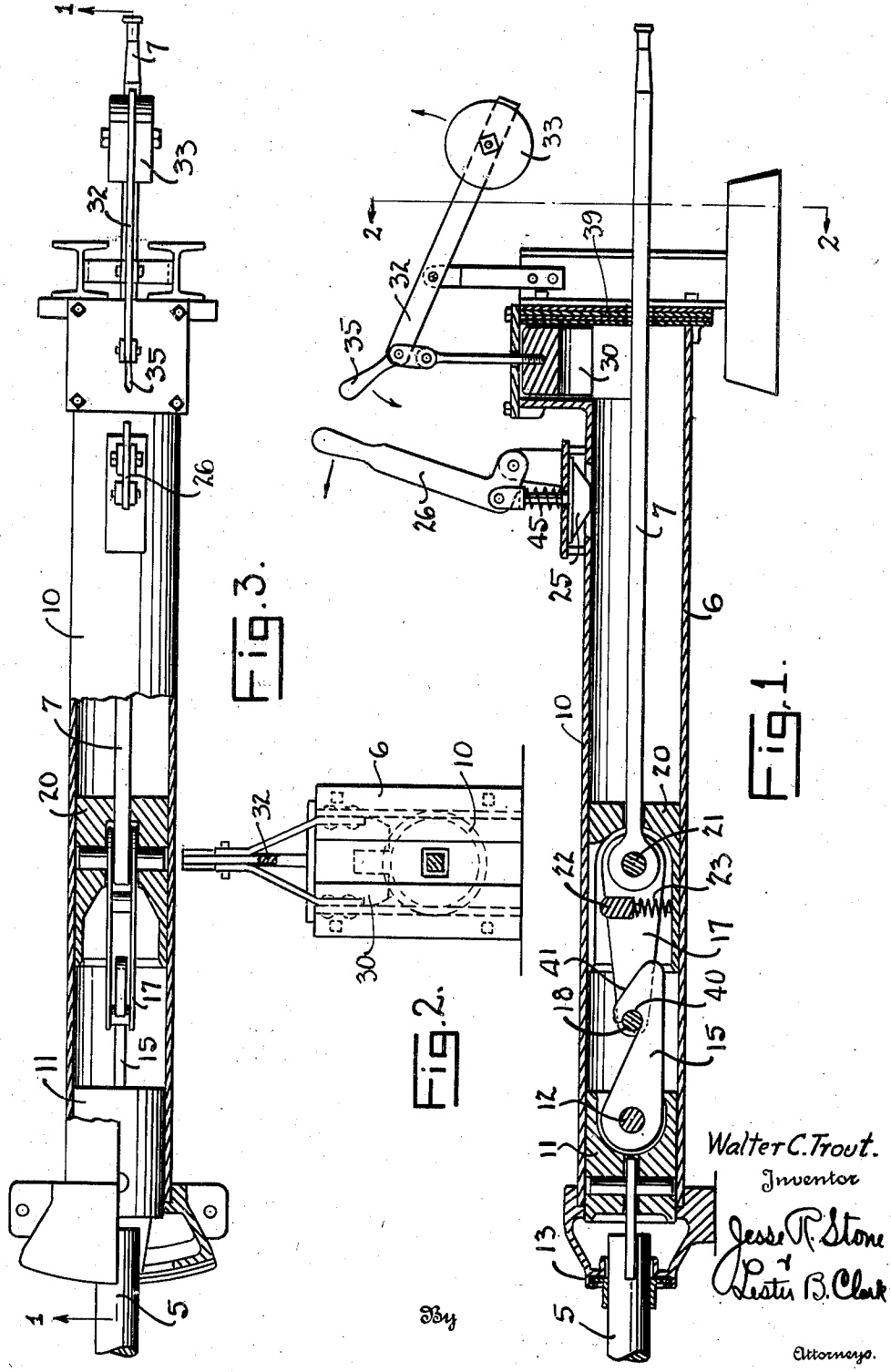


Fig. 3.

Fig. 2.

Fig. 1.

Walter C. Trout.
Inventor

By Jesse R. Stone
Lester B. Clark
Attorneys.

Nov. 15, 1938. W. C. TROUT 2,136,480

SAFETY COUPLER CONNECTION FOR OIL WELL PUMPING POWERS

Original Filed May 26, 1933 2 Sheets-Sheet 2

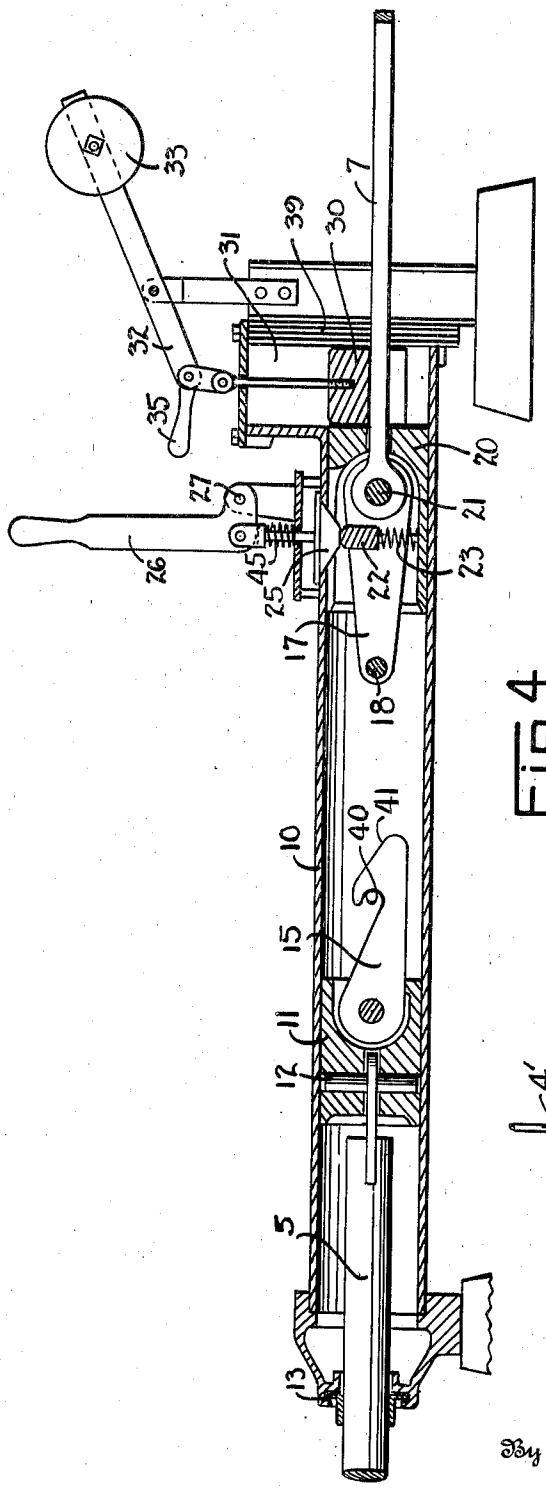


Fig. 4.

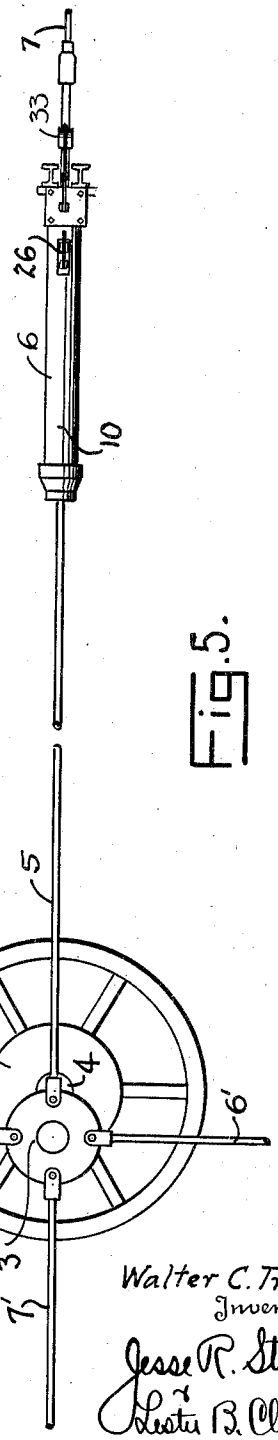


Fig. 5.

Walter C. Trout.
Inventor

By Jesse R. Stone
Lester B. Clark

Attorneys.

Patented Nov. 15, 1938 2,136,480

UNITED STATES PATENT OFFICE

2,136,480

SAFETY COUPLER CONNECTION FOR OIL WELL PUMPING POWERS

Walter C. Trout, Lufkin, Tex., assignor to Lufkin Foundry & Machine Company, Lufkin, Tex., a corporation

Application May 26, 1933, Serial No. 672,985
Renewed February 1, 1937

13 Claims. (Cl. 74—593)

The invention relates to a safety coupler shock absorbing device, particularly adapted for use in connecting the pull rods to oil well pumping powers.

It will be understood that in the pumping of oil from wells it is not uncommon to use a single power unit to accomplish the pumping operation upon a plurality of wells by connecting the pull rods of all of the wells to a rotating unit known as a pumping power. During the pumping operation it is, of course, necessary to connect and disconnect these pull rods to the pumping power. Often but one well of the several connected to the pumping power requires attention of some sort, and it is desirable to disconnect this pull rod from the pumping power without interrupting the operation of the pumping power or the other wells connected thereto. Heretofore it has been the practice to use what is known as a knock-out post, or an uncoupler, which is used with a C-link. The practice of coupling and uncoupling these C-links, however, is very dangerous because the entire weight of the pumped liquid in the well is being carried by the pull rod, or pull line, and when it is coupled, or uncoupled, with respect to the pumping power care must be had or the operator will be injured. With a view of improving the construction and providing an absolutely safe construction which will be enclosed and readily workable, the present invention has been designed.

It is one of the objects of the invention to enclose the coupling connection for pumping power pull rods.

It is another object of the invention to provide an automatic coupler and shock absorber for pull line connections.

Other and further objects of the invention will be readily apparent when the following description is considered in connection with the accompanying drawings wherein:

Fig. 1 is a central, vertical, sectional view, taken on the line 1—1 of Fig. 3, and shows a safety coupler with the parts coupled together in normal operation.

Fig. 2 is a section taken on the line 2—2 of Fig. 1, and looking in the direction of the arrow.

Fig. 3 is a top plan view with certain parts broken away and shown in section to illustrate the arrangement of these parts.

Fig. 4 is a section similar to Fig. 1, but showing the parts in uncoupled position.

Fig. 5 is a diagrammatic view showing the general position of the invention with respect to the pumping power.

By having reference to Fig. 5, the pumping power is indicated generally at 2, and embodies a ring 3 which is eccentrically mounted upon the shaft 4 so that upon rotation there will be a pull exerted upon the pull lines 4', 5, 6' and 7'. It seems obvious that the pull on the line 5 tends to balance the pull on the line 7', so that a minimum of power is required to pump a plurality of wells by this arrangement.

The pull line 5 extends through the safety coupler which is indicated generally at 6, and is connected to the rod or cable 7 extending over to the well being pumped. It will be understood that the weight of the column of liquid in the well is exerted on the line 7 and this line must be coupled to the pull line 5 of the pumping power.

For purposes of illustration, it may be assumed that the parts are uncoupled and are in the position shown in Fig. 4. The rod or line 5 is shown as extending into the safety housing 10 and has attached thereto a piston or carriage 11 which is connected to the rod 5 by means of the wrist pin 12. This carriage 11 is arranged for reciprocation in the coupler housing 10 and a suitable stuffing box 13 may be provided on the end of the housing. As seen the housing 10 is in horizontal position and arranged in alignment with the rods 5 and 7. The carriage 11 has pivoted therein the coupler hook 15 which extends into the housing 10 beyond the carriage 11.

As the pumping power 2 is in operation the carriage 11 will be caused to reciprocate back and forth in the housing 10, a distance equal to the stroke of the pumping power.

When it is desired to connect the well to be pumped to the reciprocating hook 15 it is accomplished by engaging the link 17 with the hook 15. The link 17 is shown in plan view in Fig. 3 and comprises two side pieces joined by a suitable cross-bar 18, so that the side pieces will straddle the hook 15.

The link 17 is pivoted in a carrier 20 by the cross-shaft 21 which also has connected thereto the pull line 7. The carrier 20 is arranged for reciprocation in the housing 10, the same as the carriage 11. Due to the weight on the pull line 7, the carrier 20 will normally be moved to the right as viewed in Fig. 4. The cross-bar 22 is provided between the side pieces of the link 17 and a spring 23 normally tends to raise the cross-bar and the link 17 from the position shown in Fig. 4. A plunger 25, however, may be moved to the position shown in Fig. 4 and cause depression of the cross-bar 22 and the link 17. The plunger is operated by a suitable handle 26 which is piv-

oted at 27 to the frame work supporting the housing 10. The plunger 25 works through an opening in the housing 10.

The carrier 20 is prevented from moving to its extreme position to the right as viewed in Fig. 4 by the stop-block 30. This block is normally suspended in the chamber 31 by means of the pivoted lever 32 and the weight 33, and in raised position, so that when the device is in operation the carrier 20 may reciprocate beyond the position shown in Fig. 4. When, however, the device is to be uncoupled, the stop-block 30 is lowered by depressing either the handle 35 or raising the weight 33 at such a period in the stroke that the carrier 20 is not raised. Of course, as the carrier 20 returns to the end of its stroke it will engage against the stop-block 30 which will absorb the load or the column of liquid to the well. Suitable pumps or buffet plates 39 are provided to absorb this shock. When the carrier 20 is stopped by the block 30, of course the carriage 11 will continue its stroke to such an extent that the cross-rod 18 will move out of the notch 40 in the hook and the spring 23 will instantly throw the link upwardly so that when the hook 15 reverses its movement and starts back to the left, as viewed in Fig. 4, it will not reengage the cross-bar 18. Thusly the link 17 is disconnected from the hook 15. It is understood that normally the handle 26 is in the position shown in Fig. 1 and the lever 32 is also in the position shown in Fig. 1.

After suitable repairs or servicing of the well has been accomplished, and it is desired to couple the well to the pumping power, it is only necessary for the operator to move the handle 26 from the position of Fig. 1 to the position of Fig. 4. In this manner the plunger 25 depresses the cross-bar 22 and moves the link 17 into the path of the reciprocating hook 15. The plunger 25 is spring pressed to normally hold it inoperative except when pressure is applied thereto. The forward end of the hook 15 is beveled as at 41 so that when the link is depressed by the plunger 25, the cross-bar 18 will engage this bevel 41 and ride over the head of the hook and be engaged in the recess 40. As the hook returns to the left, as viewed in Fig. 4, it will pull the link 17 with it, and the handle 26 may then be released so that the spring 45 will raise it to the position of Fig. 1. Of course, as soon as the pressure is released from the stop-block 30 the weight 33 will cause the lever and stop-block to move to inoperative position shown in Fig. 1.

The present invention is of particular advantage because the operator need only actuate the levers 32 and 26 to perform the coupling or uncoupling operation. The dangerous portions of the device, namely the hook 15 and link 17, are entirely enclosed in the housing 10 and no injury can occur to the operator. The stop-block 30 is also enclosed in the chamber 31 so that the device is clearly a safety coupler for the pull rod connection. The coupler is shown only on the line 5 but all the lines will be so equipped.

What is claimed is:

1. A safety coupler for pumping power pull lines including a housing, a pull line hook slidably mounted therein, a pull line link slidably mounted in said housing, means to normally hold said link in raised position, and means adapted to enter said housing to depress said link to hook engaging position.

2. A safety coupler for pumping power pull lines including a housing, a pull line hook slidably mounted therein, a pull line link slidably mounted in said housing, means to normally hold said link in raised position, means to depress said link to be engaged by said hook, and additional means to stop said link short of its stroke whereby said first means will raise said link from engagement with said hook.

3. In combination with a pumping power a rod line, a hook off connection for said line, said connection including a hook and a link adapted for connection, means enclosing said hook and said link, means exterior of said first means operable to effect connection of said link with said hook, and a piston carriage in said enclosing means for each said hook and said link.

4. In combination with a pumping power a rod line, a hook off connection for said line, said connection including a hook and a link adapted for connection, means enclosing said hook and said link, and means exterior of said first means operable to stop said link to effect connection of said link with said hook, and additional means within said enclosure to effect release of said link from said hook.

5. In combination with a pumping power a rod line, a safety hook off connection for said line, said connection including an enclosed hook and link, means to connect and disconnect said hook and link including a stop in the longitudinal path of the link to disconnect it from the hook, and means movable into the transverse path of the link to cause it to connect to said hook.

6. A hook off connection for pull lines including a housing, a pair of members slidable therein, a hook on one member, a link on the other member, said link being pivoted to engage and disengage said hook, means to urge the link out of the path of the hook, and means to stop the member carrying the link so that said last means will release it automatically.

7. A hook off connection for pull lines including a housing, a pair of members slidable therein, a hook on one member, a link on the other member, said link being pivoted to engage and disengage said hook, means to urge the link out of the path of the hook, and means to stop the member carrying the link so that said last means will release it automatically, and additional means to depress said link into the path of said hook to reconnect it.

8. In a hook off connection device for pull line, a cylinder to enclose the device so that the connections may be made in safety, hook off connections for the ends of the lines, two carrier members slidably disposed in said cylinder and each carrying one of said connections, and means also carried by said cylinder to effect connection and disconnection.

9. A safety coupler for pumping power pull lines including a housing, a pull line hook slidably mounted therein, a pull line link slidably mounted in said housing, means to normally urge one of said hook-off members into a biased position of disengagement from the other of said members, and means adapted to enter said housing to move the biased member to effect engagement of the hook-off members.

10. A safety coupler for pumping power pull lines including a housing, a pull line hook slidably mounted therein, a pull line link slidably mounted in said housing, means to normally urge one of said hook-off members into a biased position of disengagement from the other of said members, means adapted to enter said housing to move the biased member to effect engagement of

the hook-off members, and means for absorbing the shock incident to stopping of the pull line.

11. In a device of the character described, a driving member connected to a source of power, a driven member comprising a cross head having a rod line connected thereto, a hook-off member pivotally mounted on said cross head and adapted to engage said driving member, means to normally urge said hook-off member from engaging relation with said driving member, and means movable into the path of travel of said cross head to arrest its movement before the end of its stroke whereby said hook-off member is disengaged from said driving member by said means.

12. In a device of the character described, a driving member connected to a source of power, a driven member comprising a cross head having a rod line connected thereto, a hook-off member on said cross head, means to pivot said member so that it is adapted to being forced to engage said driving member, and means for arresting the movement of said cross head before the end of its stroke release said first means to disengage the driving and driven members.

13. A coupler connection for pumping pull lines comprising a power line, a pull line, means to releasably connect said lines, means to arrest said pull line before it reaches the end of a normal stroke so that it may release said connecting means from said power line, and an additional member to be moved into the path of said connecting means to effect reengagement thereof so as to allow automatic removal of said arresting means.

WALTER C. TROUT.