Oct. 18, 1938. W. D. HARVEY ET AL. 2,133,893

ROD LINE PICK-UP TOOL

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Fig. 1

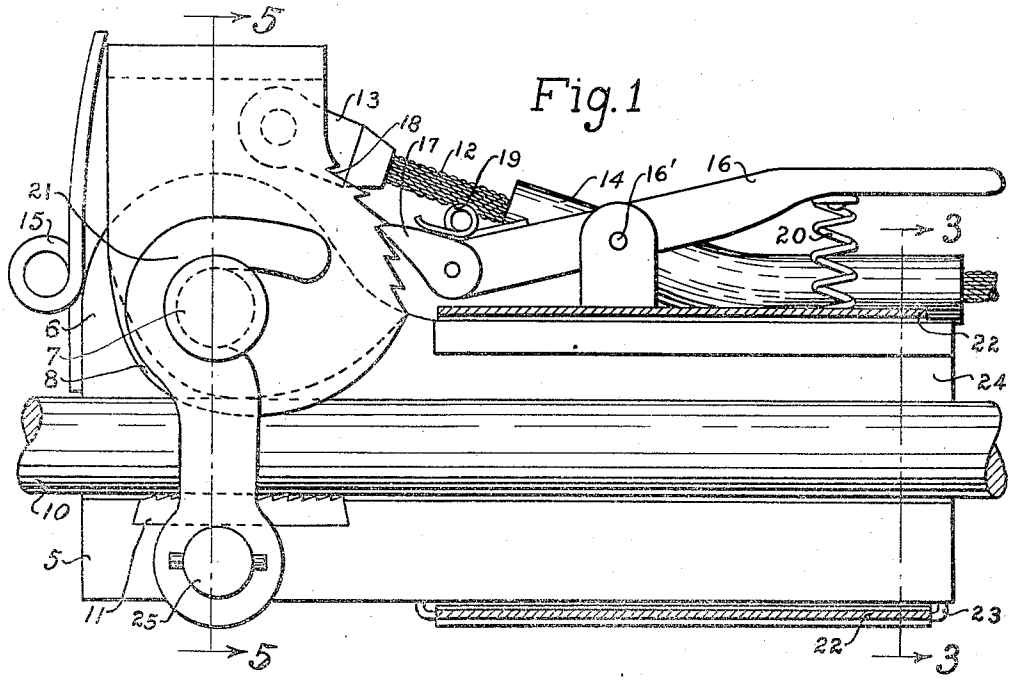


Fig. 2

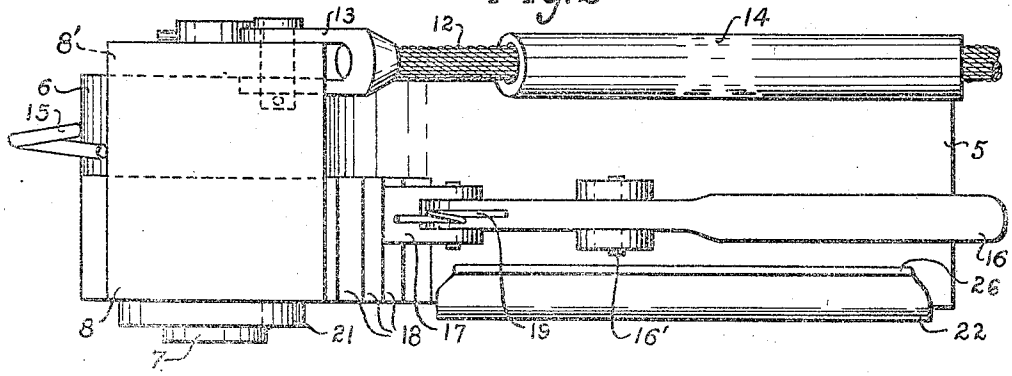
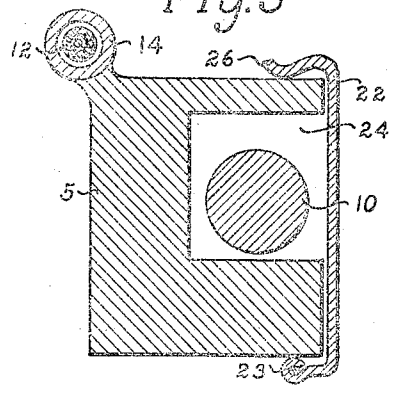


Fig. 3



William D. Harvey
Leonard C. Marshall
INVENTORS.

BY J. Preston Swecker
their ATTORNEY.

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Fig.4

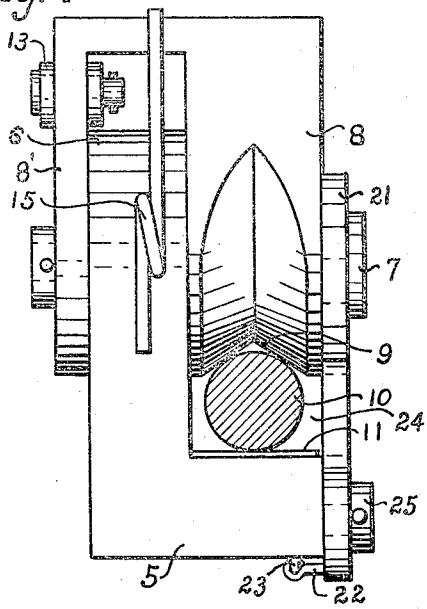


Fig.5

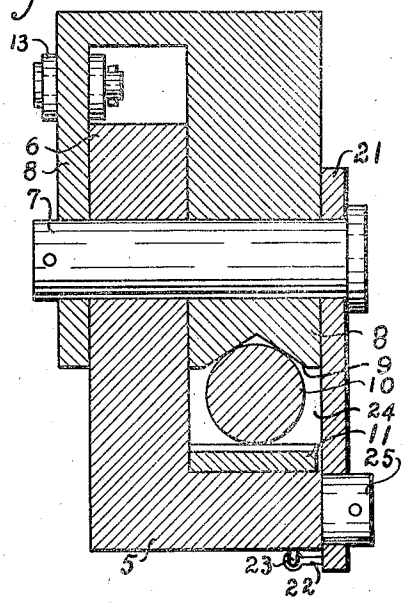
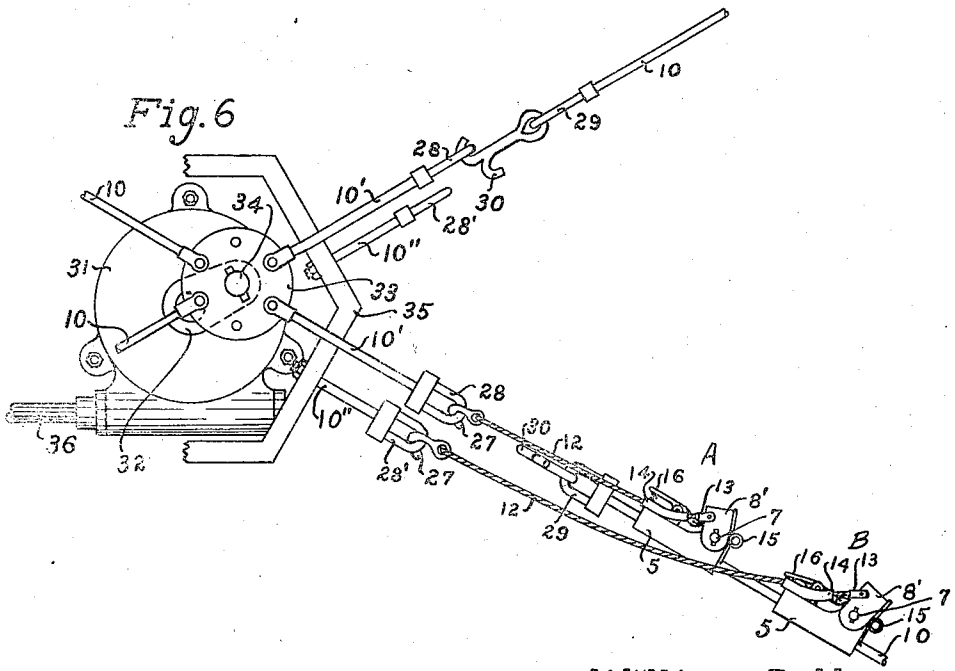


Fig.6



William D. Harvey
Leonard C. Marshall
INVENTORS.

BY

ATTORNEY.

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ROD LINE PICK-UP TOOL

William D. Harvey and Leonard C. Marshall, Nocona, Tex.; said Marshall assignor to Jesse D. Woods, Nocona, Tex.

Application August 13, 1937, Serial No. 159,012

13 Claims. (Cl. 294—104)

This invention relates to an improvement in rod line pick-up tools for use in reconnecting or drawing together reciprocating rod lines that have become disconnected or broken.

The object of the invention is to provide for gripping a section of rod, as the tool is moved in one direction and then the tool is released and moved out on the rod and then regripped for another inward stroke, so that the sections are drawn together step-by-step by the successive reciprocations of the rod line drive.

This object is accomplished by the provision of a tool having a clutch engagement with a rod section that is automatically engaged when the section is moved in one direction to grip the same and may be released for movement in the opposite direction, thus advancing the section with respect to said tool each stroke of the rod line.

A preferred embodiment of this invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a side elevation of the tool in place on the rod line, with the guard shield partly broken away and in section;

Fig. 2 is a top plan view of the tool;

Fig. 3 is a transverse sectional view on the line 3—3 of Fig. 1;

Fig. 4 is an end elevation thereof showing the rod line in section;

Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 1; and

Fig. 6 is a top plan view of portions of rod lines and an operator, showing the invention in use.

The tool comprising this invention has an elongated body portion 5 provided with an upstanding lug 6, at one end thereof. The lug 6 has a transverse opening therethrough in which is mounted a pin 7, one end of which journals a cam 8, disposed beside the lug 6. The cam 8 has a concave or grooved undersurface 9, which forms a clutch surface or face for a rod line 10, a section of which is adapted to extend lengthwise of the body portion 5 between the clutching surface 9, and a toothed die 11 secured upon the body portion 5. The body portion 5 has a longitudinal recess 24 in a side thereof within which the rod line section extends and is adapted to be reciprocated, the die 11 being removably mounted in the body portion at the under face of said recess opposite the clutching surface of the cam 8 to insure a positive grip when the cam is engaged.

The cam has a lateral bifurcation 8, which straddles the lug 6, with the pin 7 extending through said bifurcation 8', as well as through the lug and cam. A cable 12 is attached to the bifurcation 8' of the cam 8 by means of a clevis 13 pivoted thereto. The cable 12 extends through a guide 14, the lower portion of which is attached to the upper side of the body portion 5, as shown in Fig. 4, by means of welding, soldering, or other type of fastening, so that the cable 12 is directed in parallel relation to the rod line 10. As a further means of engaging the cam 8 with the rod line 10, a coiled spring 15 has one end permanently attached to the upstanding lug 6, while the other bears against the upper end of the cam tending to move the same into engagement with the rod line on inward movement of the tool relative thereto.

In order to positively release the cam 8 from the rod line manually, a lever 16 is pivotally supported at 16' to the body portion 5 and carries a pawl 17 at its free end in position to engage ratchet teeth 18 formed on the forward edge of the cam 8. Several ratchet teeth are preferably provided to give the fullest adjustment for rod lines of various sizes. A spring 19 has one end fixed to the lever 16, while the opposite end bears upon the pawl 17 to hold the said pawl in engagement with the selected ratchet tooth. This lever 16 should be moved into engagement with the desired ratchet tooth before the cam 8 engages the rod line. A spring 20 bears upwardly on the inner end of the lever 16 normally tending to hold the lever in its set position, but upon depressing the inner end of the lever 16 against the tension of the spring 20, the cam 8 will be turned in a counterclockwise direction in Fig. 1 to release the rod line therefrom.

The outer end of the pin 7 laterally of the cam 8, is engaged by a hook 21 pivoted at 25 to strengthen said pin and hold the same in place while at the same time being capable of swinging back for lateral removal of the tool from the rod line. The recess 24 is normally closed by a guard shield 22, hinged to the bottom of the body portion 5 at 23, so that it may be swung down to permit such lateral removal of the tool from the rod line. The upper edge of the guard shield 22 is formed with a spring catch 26 to engage the upper surface of the body portion and normally tend to hold said guard shield in place.

When it is desired to pick up or reconnect a rod line with the tool, the hook 21 and the guard shield 22 are swung to open positions for relative lateral insertion of the tool on the rod line, disposing the rod line in the recess 24 and between the clutching surface 9 of the cam 8 and the die 11. Thereafter the hook 21 is swung into engagement with the pin 7 and the guard shield 22 is closed

over the recess 24, properly disposing the tool on the rod line.

Fig. 6 shows a portion of a central power device with a series of radiating rod lines extending therefrom to the respective wells for operation of the respective pumps therein. The power unit is designated 31 in Fig. 6, and is provided with a crank 32 receiving a connecting disc 33 on a crank pin 34; the respective rod lines are connected with the disc 33 for reciprocation thereby in the usual method of operating a series of well pumps from a single source of power. The power unit 31 may be driven by the usual drive shaft 36.

When a rod line breaks, it must be repaired or replaced while it is not under strain by the string of well tools or pump elements attached thereto, and the repair must be made without stopping the source of power which is driving the other rod lines for the other wells. To permit of this, each rod line 10 has a section 10' connected with the disc 33 and the rod line sections 10' and 10 having eyes 28 and 29, attached thereto respectively, and hook 30 being carried by the latter to engage the eye 28 for full connection between the sections of the rod line.

After the repair has been made in the broken rod line, the end of the rod line 10 is usually some distance from where it engages the power connection 28 at the source of power. The rod line 10 and the weight of the rods in the well make up a substantial load which has made it very difficult heretofore for an operator to recouple the rod line with the source of power. This invention enables this to be accomplished very simply and easily by one man through the use of a pair of these pick-up tools, according to this invention, in the arrangement shown in Fig. 6. Each tool is applied to the section 10 of the rod line in the manner described above, the tools being designated A and B in Fig. 6, and are shown as having different lengths of cables 12, the cable of the tool A having its hook 27 engaging the eye 28 of the rod line section 10', while the hook of the cable of the tool B engages a similar eye 28' of a fixed rod 10'' attached to a permanent support 35. When these parts are coupled, as shown at the lower right side of Fig. 6, the rotation of the crank 32 will reciprocate the rod section 10' the distance of the length of throw of the crank.

Upon inward movement of the section 10' to the left in Fig. 6, the cable 12 of the tool A will be tightened causing the cam 8 thereof to engage and grip the rod 10 to draw the line inward, the length of stroke or throw of the crank 32 being the length of movement to the left of the rod section 10'. The tool B is held by the operator and permits sliding movement of the rod line 10 therethrough. At the end of the inward stroke of the section 10', the cam 8 of the tool B will engage the rod line 10, as soon as it starts to return due to the slackening of the pull at 10' and the weight of the rod line and pump tools, so that the section 10 is held against such outward movement. The tool A is then moved manually outward along the rod line 10, as the rod section 10' moves outward until the end of the out stroke is reached when the beginning of the inward stroke of the section 10' will cause the tool A to reengage the rod 10 and draw it inward as described above, repeating the cycle for each stroke of the power device until the hook 30 is drawn inward sufficiently to engage the eye 28, at which time the hook 27 may be disengaged and replaced by the hook 30 on the next stroke; after engagement of the rod line 10 with the section 10', the tool B may be removed also. Thus the tool A draws the end of the rod line 10 toward the power section 10' on the inward stroke, while the tool B holds the rod line 10 against outward movement on the outward stroke, these tools acting alternately and being moved manually with respect to the rod line 10 until the sections are brought together and reconnected.

We claim:

1. A rod line pick-up tool comprising a body portion adapted to receive a rod line, a cam pivotally mounted on the body portion in position to engage the rod line to connect the same therewith in clutching engagement, flexible means connected with the cam and extending approximately lengthwise of the rod line for actuating said cam, and means for releasing the cam from the rod line.

2. A rod line tool comprising a body portion adapted to receive a rod line, clutching means for engaging the rod line with the body portion, flexible means for actuating said clutching means and extending lengthwise of the rod line, and manual means other than said flexible means for releasing the clutching means upon relative movement of the rod line and tool in one direction.

3. A rod line tool comprising a body portion having an upstanding lug at a side thereof, a cam pivotally mounted on said lug, means in opposed relation to the cam and cooperating therewith to hold a rod line to the tool, said tool having the space between said means and the cam open laterally in the opposite direction from the lug for relative lateral removal and attachment of the tool and rod line, and means on the opposite side of the cam from the lug for closing the laterally open space to hold the rod line in place.

4. A rod line tool comprising a body portion having an upstanding lug at one side thereof, a pin extending laterally of said lug, a cam pivoted on said pin, means in opposed relation to the cam for carrying a rod line therebetween, and a hook pivoted to the body portion in position for swinging movement into engagement with the outer end portion of the pin to hold the same in place while permitting lateral separation of the rod line and tool.

5. A rod line tool comprising a body portion having a longitudinal recess in a side thereof adapted to receive a rod line lengthwise through said recess, opposed means at opposite sides of the recess for clamping a rod line thereto, another side of said recess being permanently closed, and means at the opposite side of the recess from said permanently closed side for removably closing the same.

6. A rod line tool comprising a body portion adapted to receive a rod line, a cam-like member pivotally mounted on the body portion for clutching engagement with the rod line, means for operating the cam-like member in one direction, and a lever pivoted to the body portion in position to actuate the cam-like member in the opposite direction.

7. A rod line tool comprising a body portion adapted to receive a rod line, a cam-like member pivotally mounted on the body portion in position to engage the rod line in clutching engagement, said cam-like member having ratchet teeth on one side thereof, a lever pivoted to the body portion and carrying a pawl in position to engage

the teeth to move the cam-like member in one direction, and flexible means connected with the cam-like member for moving the same in the opposite direction.

8. A rod line tool comprising a body portion adapted to receive a rod line, a cam-like member pivotally mounted on the body portion in position to engage the rod line in clutching engagement, said cam-like member having ratchet teeth on one side thereof, a lever pivoted to the body portion and carrying a pawl in position to engage the teeth to move the cam-like member in one direction, flexible means connected with the cam-like member for moving the same in the opposite direction, means carried by the body portion for directing said flexible means in a direction lengthwise of the rod line, and resilient means acting on the cam-like member to move the same in the direction of said flexible means.

9. A rod line pick-up tool comprising an elongated body having a rod-receiving throat, a movable element mounted upon said body in position for engagement with a rod in the throat, flexible means connected with said movable element for causing engagement with said rod upon moving of said flexible element, and means for guiding said flexible means lengthwise along said body.

10. A rod line tool comprising an elongated body portion having a longitudinal recess in a side thereof adapted to receive a rod line, means for removably closing the open side of said recess to confine the rod line therein, and means for clamping said rod line to the tool.

11. A rod line tool comprising an elongated body portion having a longitudinal recess in a side thereof adapted to receive a rod line, means for removably closing the open side of said recess to confine the rod line therein, and a cam at one end of said recess operating in a plane extending lengthwise thereof for clamping said rod line to the tool.

12. A rod line tool comprising a body portion having an upstanding lug thereon, a cam having an arm embracing said lug, a pivot pin extending through the cam, arm and lug and pivotally connecting the cam with the lug, and means connected with said arm for actuating the cam.

13. A rod line tool comprising a body portion, a cam pivotally mounted on the body portion, resilient means between the body portion and cam and acting to move the cam in one direction, and actuating means for said cam.

WILLIAM D. HARVEY.
LEONARD C. MARSHALL.