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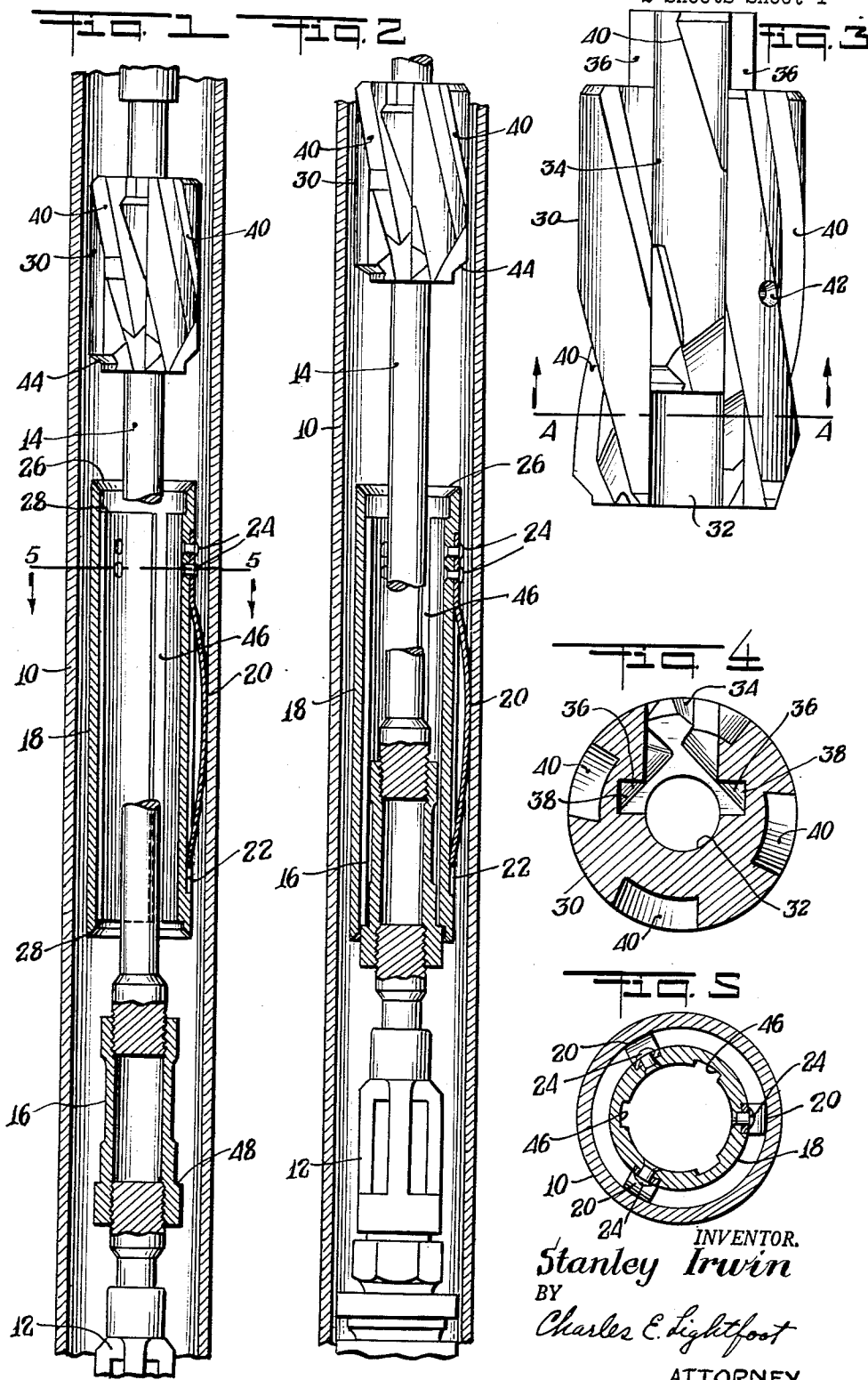
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2,712,853

PARAFFIN REMOVER

Filed Aug. 14, 1950

2 Sheets-Sheet 1



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Fig. 6

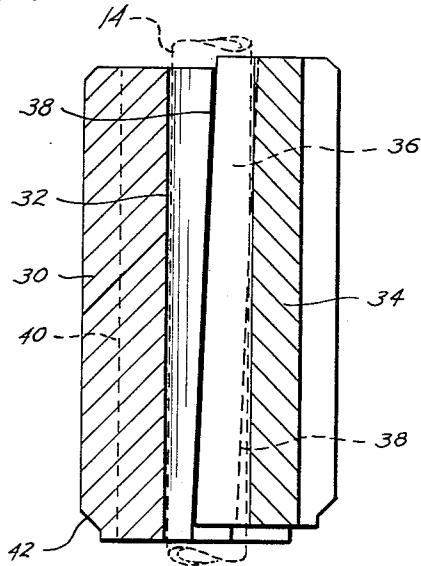
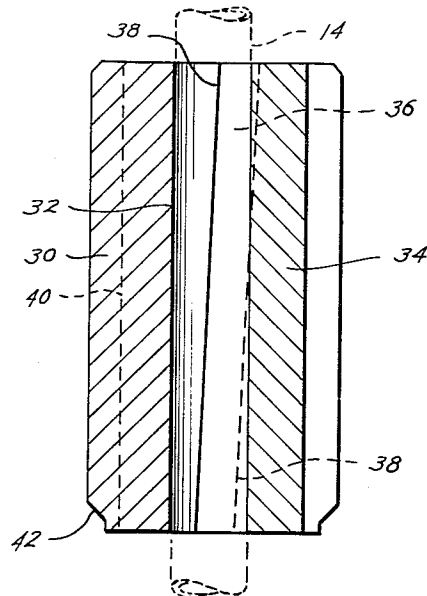


Fig. 7



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1 Claim. (Cl. 166—175)

This invention relates to a paraffin removing device for oil wells and the like.

The invention has for an important object the provision of a paraffin remover, or scraper, adapted for the removal of paraffin, or other deposits, from the inside of well pump tubing upon withdrawal of the pump sucker rod from the well.

In well pumping operations, and especially in the pumping of oil wells, thick deposits of paraffin or other materials of similar character often collect on the inside of the pump tubing to an extent which interferes with the operation of the pump and the flow of fluid. Such deposits must be removed from time to time to maintain the efficiency of production from the well, and it is the chief object of the present invention to provide means for the removal of the deposits when the pump sucker rod is withdrawn from the well for purposes of maintenance and repair.

Another object of the invention is the provision of a paraffin removing device, which is self-adjusting in the well casing during the pumping operation, so that excessive wear on the parts is effectively eliminated, and which device also includes means capable of use as a jar to overcome sticking of the cutter when the same is being used in removing heavy deposits or material of particularly hard character.

A further object of the invention is to provide a paraffin removing device of simple design and rugged construction which is easily applied to the sucker rod and which is capable of withstanding the severe conditions of use to which such devices are subjected in operation.

The invention will best be understood from the following detailed description constituting a specification of the same when taken in conjunction with the annexed drawings, wherein—

Figure 1 is a side elevational view, partly in cross-section, showing the invention applied to a pump rod in condition for operation;

Figure 2 is a side elevational view, partly in cross-section, showing the invention applied to the pump rod as the same is being removed from the well;

Figure 3 is a side elevational view on a somewhat enlarged scale of the spirally grooved retainer member of the invention;

Figure 4 is a cross-sectional view taken along the line 4—4 of Figure 3;

Figure 5 is a cross-sectional view taken along the line 5—5 of Figure 1, looking in the direction indicated by the arrows.

Figure 6 is a vertical, central, cross-sectional view, on an enlarged scale, of the retainer member of the invention, showing the details of construction of the same, and the manner in which the retainer is assembled; and

Figure 7 is a view similar to that of Figure 6, showing the retainer with the parts thereof in a different position.

Referring now to the drawings in greater detail, wherein like reference numerals indicate the same parts

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throughout the several views, the numeral 10 designates a pump tubing within which a travelling valve mechanism 12 of a pump of conventional design is located.

A pump rod or sucker rod 14 is connected to the travelling valve 12 and this sucker rod may be composed of a number of sections of any convenient length connected by suitable couplings, such as that indicated at 16.

The paraffin scraper, or remover, is in the form of a tubular cutter body 18, having a diameter adapting it to fit snugly within the pump tubing 10. For the sake of distinctness the body 18 has been shown in the drawings as being spaced somewhat from the wall of the pump tubing, but in actual practice this body may fit the pump tubing closely enough to assure the removal of the deposit therefrom by scraping of the body as the same moves longitudinally of the tubing.

Resilient means such as the flat bowed springs 20 may be secured at one end by rivets 24 or other suitable fastening means to the outside of the body 18, these members fitting into recesses 22 in the body, and being bowed outwardly to engage the pump tubing to resist movement of the body in the tubing.

At its ends the body is formed with beveled cutting edges 26, and within the ends there are provided internal shoulders 28 for a purpose later to be made apparent.

Above the body 18 a retainer member 30 is secured on the pump rod. This retainer member has a central longitudinal bore 32 through which the rod passes, and is formed with a moveable portion 34 slidable in the retainer member. The moveable portion is preferably formed with laterally extending ribs 36 which are received in longitudinal slots 38 in the retainer member, and these slots may be arranged at a slight angle to the axis of the bore 32, so that the part 34 has a wedging action on the sucker rod 14 when the retainer member is positioned thereon and the part 34 is inserted in the member, in the manner illustrated in Figure 3.

External spiralled grooves 40 are formed in the retainer member and its moveable part 34 which provide free passageways for the movement of fluid in the pump tube past the retainer. By so forming the grooves 40 contact between the retainer 30 and the wall of the pump tubing may take place about the entire periphery of the retainer rather than in certain limited areas only as would be the case if the grooves 40 were straight. In this way excessive wear or grooving of the pump tubing on the inside is effectively eliminated, while at the same time making ample provision for the passage of fluid through the tubing.

A small hole 42 may be provided through the retainer, and a series of longitudinally spaced holes, not shown, may be formed in one of the flanges 36 for alignment with the hole 42, whereby a pin may be inserted through the retainer and its moveable part, to prevent loosening of the parts when secured on the sucker rod. The retainer member also has a beveled seat 44 at its lower end which is adapted to seat on the beveled end portion 26 at the top of the cutter body when the retainer engages the body.

Internal longitudinal grooves 46 may be formed in the cutter body 18 to provide additional opening therethrough for the passage of fluid.

The coupling 16 is formed with an external shoulder 48 adapted to seat on the internal shoulder 28 in the lower end of the cutter body 18 when the sucker rod is being removed from the well, in order to carry with it the cutter body, as best seen in Figure 1.

In applying the device to a well, the cutter body 18 is placed on the sucker rod above the coupling 16, and the retainer member 30 is secured on the sucker rod above the cutter body by adjusting the moveable part 34 in the retainer to grip the rod in the bore 32. As

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seen in Figure 6, the moveable part 34 may be inserted in the body of the retainer with the laterally extending rib, 36 slidably disposed in the slots 38, and the moveable part may then move downwardly to a position, such as that shown in Figure 7, to clamp the retainer in adjusted position on the rod 14.

The sucker rod, which may carry the pump at its lower end, is then inserted in the pump tubing 10. The engagement of the resilient members 20 with the inside of the tubing will resist downward movement of the cutter body 18, which causes the rod to move downwardly therein until the retainer 30 is seated on the upper end of the cutter body. Thereafter, downward movement of the sucker rod forces the cutter body downwardly in the tubing.

In oil well operation it is customary to raise the pump somewhat above the bottom of the well, where it is maintained during the pumping of the well. When the pump has reached the bottom of the well, it is moved upwardly, therefore, to clear the bottom, and upon such upward movement, the shoulder 48 of coupling 16 engages internal shoulder 28 of the cutter body to raise the latter with the pump. During operation of the pump the sucker rod moves up and down through the cutter body, but does not move the cutter body with it, since the retainer 30 is spaced sufficiently above the body a greater distance than the length of the pump stroke.

The paraffin removing device is preferably located on the sucker rod at a point just below the level of the liquid in the well, which is usually the location in which the greatest deposit of paraffin or other similar material takes place. In case that the accumulation of paraffin is extensive, as many of the remover devices may be applied to the sucker rod as may be desired, locating the same at suitably spaced intervals thereon.

When it is desired to remove the pump or the sucker rod from the pump tubing, in order to remove the accumulated paraffin or for other purposes, the coupling 16 engages the lower end of the cutter body, as previously explained, and the cutter is withdrawn with the rod. As the cutter moves upwardly it cuts through the deposited material and frees it from the wall of the tubing, and because of the closing of the cutter body by the coupling, the paraffin is forced upwardly in the tubing. Should the deposited material be so great as to cause the cutter to stick and prevent further withdrawal of the sucker rod, the rod may be moved downwardly to engage the retainer 30 with the cutter and jar the same

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downwardly free of the paraffin, after which the cutter may again be moved up with the rod to loosen the deposit. This jarring action may be repeated as often as necessary to secure the removal of the deposited material.

It will thus be seen that the invention as above described provides a paraffin removing device which is efficient in operation, and which may be operated with a minimum of wear and tear on the moving parts, whereby the same is capable of rendering long trouble-free service under all conditions likely to be encountered in its use.

The invention has been disclosed in connection with a particular embodiment of the same, but it will be understood that this is by way of illustration only, and numerous changes may be made in the construction and arrangement of the various parts without departing from the spirit of the invention or the scope of the appended claim.

Having thus clearly described the invention, what is claimed as new and desired to be secured by Letters Patent is:

A device for removing deposits from the inside wall of a well pump tubing, said device comprising a tubular body adapted to be positioned in a well pump tubing surrounding the sucker rod of a well pump and having an inside diameter greater than the diameter of the rod, an annular, upwardly flared cutting edge on the upper end of the body and which fits closely within the tubing, a retainer member adjustably disposed on the rod above the body means carried by the retainer member and movable thereon and wedgingly engageable with the rod to clamp the member on the rod, said retainer member being engageable with the upper end of the body upon downward movement of the rod, said retainer member having external grooves forming passages whose lower ends open within said body when the retainer is in engagement with the body, and means on the rod beneath the body and engageable with the lower end of the body to close the same upon upward movement of the rod.

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