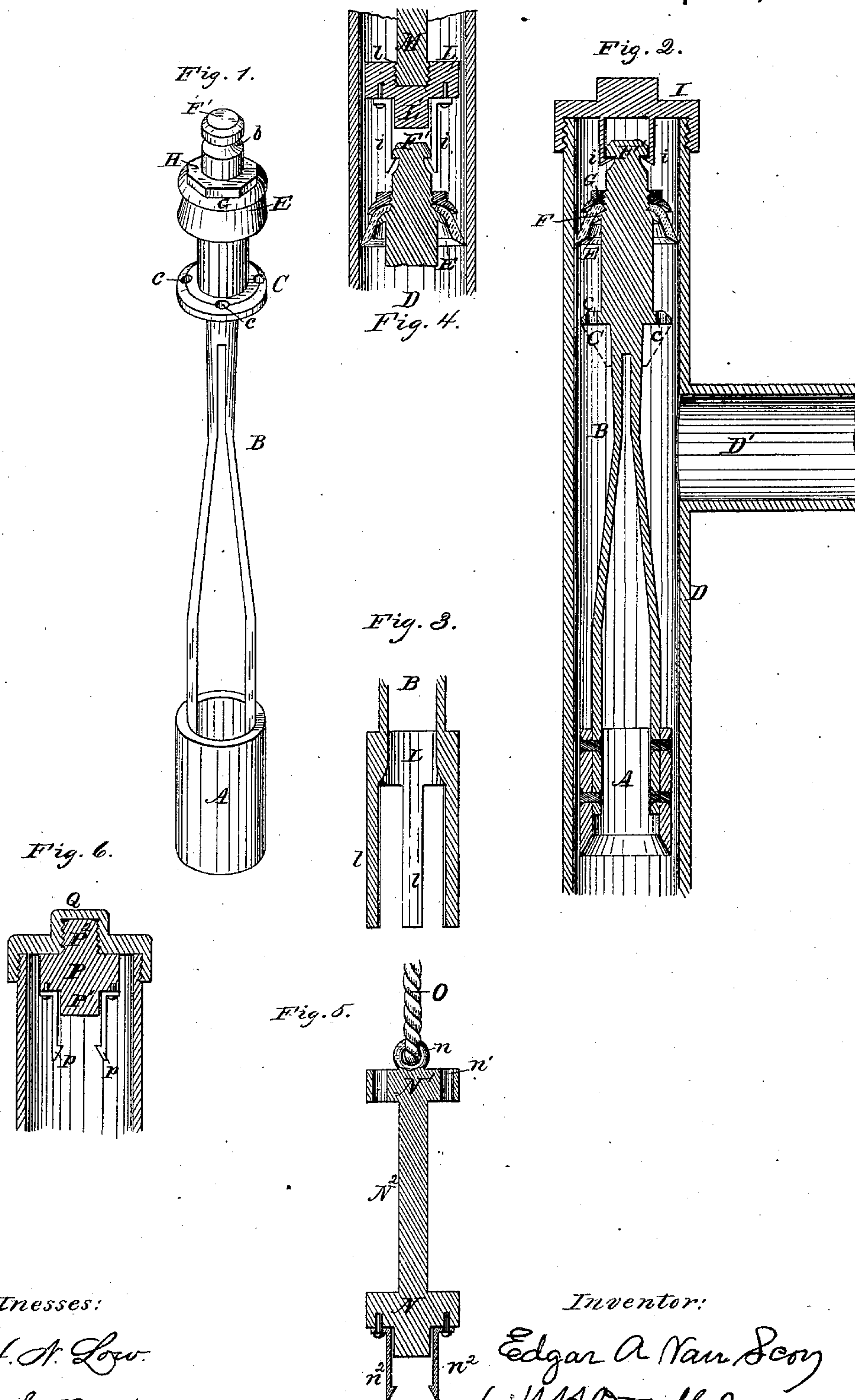


E. A. VAN SCOY.  
 Device for Removing Paraffine from Oil Well Tubing.  
 No. 232,091.      Patented Sept. 7, 1880.



Witnesses:

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# UNITED STATES PATENT OFFICE.

EDGAR A. VAN SCOY, OF BRADFORD, PENNSYLVANIA.

## DEVICE FOR REMOVING PARAFFINE FROM OIL-WELL TUBING.

SPECIFICATION forming part of Letters Patent No. 232,091, dated September 7, 1880.

Application filed January 13, 1880.

*To all whom it may concern:*

Be it known that I, EDGAR A. VAN SCOY, of Bradford, in the county of McKean and State of Pennsylvania, have invented certain new and useful Improvements in Devices for Removing Paraffine from Oil-Well Tubing; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 is a perspective view of my improved scraper detached from the tubing. Fig. 2 is a vertical section of the same applied within the tubing of an oil-well. Fig. 3 is a vertical section of a modified form of the lower end of the scraper, and Fig. 4 is a vertical section of a movable clamp or grab adapted to remove the scraper from the tubing. Fig. 5 shows a modification of Fig. 4, and Fig. 6 shows a modification of cap and clamp at the upper end of the tubing seen in Fig. 2.

In the drawings, A is a tubular scraper, provided at the lower end with a cutting-edge, adapted to remove the paraffine from the inside of the tubing, and of such size as to fit closely the inside thereof.

B is a bifurcated standard or shank rising from the tubular part A, and by preference cast in one piece therewith. This shank is expanded at C into a disk something less in diameter than the tubular scraper A, and provided with a series of holes, *c*, to permit a free passage of the oil and gas. When preferred, the lower side of the disk may be made flaring or funnel-shaped, as indicated by dotted lines, Fig. 2, and either provided with holes corresponding with the openings *c*, or its edge may be notched or corrugated. The object of the disk is to properly guide the device, especially when passing downward past the lead pipe D, and prevent the inverted cup E from accidentally entering said lead pipe and being suspended thereon. This inverted cup may be made of leather, rubber, or other suitable material, and is secured upon a correspondingly-shaped head, F, by means of a follower or flange, G, and nut H or other equivalent device.

The upper end of the shank, which projects above the nut H, is made arrow-shaped, or is constructed with a groove, *b*, into which the spring-jaws *i i* of a clamp fit, the clamp being attached to the plug or cap I, which closes the upper end of the tubing D, for a purpose which will be soon explained.

The operation of my device is substantially as follows: The device is placed within the tubing, which by preference extends only far enough above the lead pipe D' to permit the disk C to rise above the lead pipe. When there is a free and strong discharge of oil and gas the pressure upon the under side of the cup E will support the device, with the head F' in close contact with the cap or plug I; but whenever the discharge of oil and gas has decreased from any cause before the point at which it will thus support the cleaner, it (said cleaner) will descend, and in its downward passage scrapes from the inside of the tubing such deposits of paraffine as it may come in contact with; but the cleaner will not fall to the bottom of the tubing, because the inverted cup E fits closely, the inside of the said tubing, being soft and flexible, and is not only sustained by contact with the oil, but also confines the gas, which would otherwise escape. This gas is confined until a sufficient head has accumulated, when the well will begin to flow, the effect of which is to drive the cleaner up to the top of the tubing, where it remains until the flow ceases, or, at least, slackens enough to permit the weight of the cleaner to carry it down again. This automatic rising and falling effectually prevents any injurious accumulation of paraffine.

In Fig. 4 the upper end of the shank is formed in the proper shape to receive a screw-threaded shank on the lower end of a sucker-rod, so that if the cleaner should accidentally become stuck in the tubing below the lead pipe it can be drawn out by the use of one or more sucker-rods.

In Fig. 3 the tubular part L is shorter than the corresponding part in the other figures, and is provided with downwardly-projecting legs *l*, (three or more,) which will engage with the sides of the tubing and prevent the tubular parts from entering between the end of the tubing at the couplings or thimbles and sticking fast in the joints.



In Fig. 4 I have shown the elastic jaws or fingers *i i*, adapted to pass below the part *F'*, to support the device when it is desired to remove it from the tubing.

5 Another advantage growing out of the use of a cup, *E*, which fits closely the inside of the tubing, is this: When the well ceases to flow the cleaner follows the oil down and scrapes it (the oil) from the inside of the tubing, thus preventing the deposit of paraffine, which would take place when the air came in contact with such oil as would otherwise adhere to the inside of the tubing. This avoids the necessity of a check-valve in the lead pipe.

15 I have found by experience that when the inverted cup *E* rests upon the column of oil within the tubing during a suspension of the flow the contact of the edges of the cup with the inside of the tubing, and the consequent emptying of the gas within the tubing, produces a pressure of gas upon the top of the column of oil proportioned to the weight of the float.

Were it not for the gas being thus confined by the weight of the float it would pass rapidly from the upper portion of the oil, whereby the specific gravity of crude oil would be materially increased, such increase in density of the oil necessitating a great accumulation of gas-pressure in the well to lift the column of heavy and comparatively solid oil, it being well understood that the rapidity and extent to which gas is liberated from oil depends largely upon the pressure maintained upon said oil.

35 From the above it will be seen by using my device the gas is left within the oil, and in its efforts to escape enlarges the small globules of which the oil is composed, and within which the gas is emptied, and in so doing reduces the specific gravity of the column, thus insuring that the oil shall be discharged with less pressure in the bottom of the well than would be required if my device did not thus fit closely the bore of the tubing.

45 In Fig. 5, *N N'* are disks about two inches in diameter, connected by a shank, *N<sup>2</sup>*, each disk having holes *n'*, (shown only in disk *N'*), to permit the oil to pass freely through the disks.

50 *n* is an eye or loop at the upper end of the device, to receive the end of a cord, *o*.

*n<sup>2</sup> n<sup>2</sup>* are hooks or dogs projecting from the lower disk, to engage with the arrow-head of the scraper.

55 In case the scraper should get stuck in the tubing by a blister or other projection on the inside thereof, it (the scraper) can be removed by either of the devices shown in Figs. 4 or 5.

60 In Fig. 6, *P P' P<sup>2</sup>* is a shank, of which the upper part, *P<sup>2</sup>*, is screw-threaded. The part *P* is in the form of a nut, and part *P'* is square or rectangular in cross-section, and thereby adapted to receive the spring-dogs or hook *p p*, which are secured thereto by riveting or otherwise.

*Q* is a cap having a flange screw-threaded internally to fit the top of the tubing, and pro-

vided with an internal screw-threaded socket to receive the end *P<sup>2</sup>* of the shank.

The shank may be applied to the cap when it is desired to catch and hold the scraper, and the shank may be applied to caps as now constructed by merely boring holes and threading them to receive the shank.

75 By an examination of Fig. 6 it will be readily understood that the screw-threaded end *P<sup>2</sup>* will fit the screw-threaded socket or box in the valve-stem of an ordinary working valve which is used in oil-pumps, and that by thus attaching the clamp shown in this figure to a valve-stem and lowering the contrivance into the tubing by means of a line the scraper can easily be fished out if it should become stuck in said tubing.

85 It will be observed that the effect of the inverted cup *E* in confining the gas within the oil, and thus causing the well to flow, is independent of the operation of the device in scraping paraffine from the inside of the tubing.

90 I do not in this application claim, broadly, a floating scraper arranged to be moved up and down within the tube by the action of the oil for removing paraffine, nor the arrangement of the lead pipe in the described relation to the upper and lower ends of the float; nor do I claim the method of causing an oil-well to flow; nor do I claim anything herein except the inventions explicitly set forth in the claims, preferring to claim all other patentable subject-matter in an earlier application, of which this is a division.

What I claim is—

1. The combination, in an oil-tube scraper, of a hollow cylindrical scraper open at top and bottom, a shank projecting upwardly from the cylinder, and a flexible packing attached to the upper end of said shank and fitting closely the inside of the oil-tube, substantially as set forth.

2. The combination, in an oil-tube scraper, of a hollow cylindrical scraper open at top and bottom, a bifurcated shank projecting upward from the cylinder, a flexible packing attached to the upper end of the shank, and an intermediate guide applied to the shank and adapted to maintain the float in a central position within the tubing, substantially as set forth.

3. In an oil-tube scraper, a shank rising above the scraper-float and having a lateral projection adapted to engage with a supporting-clamp, substantially as set forth.

4. The combination, with an oil-well tubing, of a floating scraper, a stopper which closes the upper end of the tubing, and a clamp attached to the stopper and adapted to support the floating scraper, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

EDGAR A. VAN SCOY.

Witnesses:

THEODORE LADD,  
W. R. HAND.