

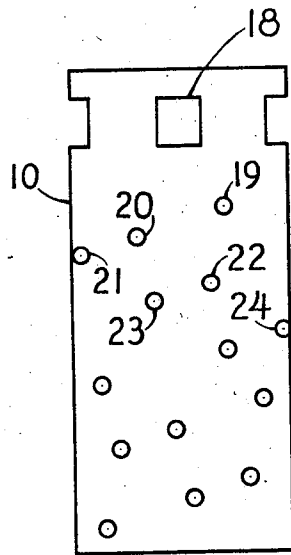
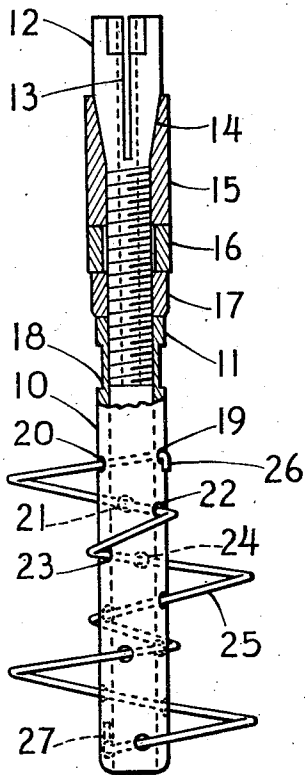
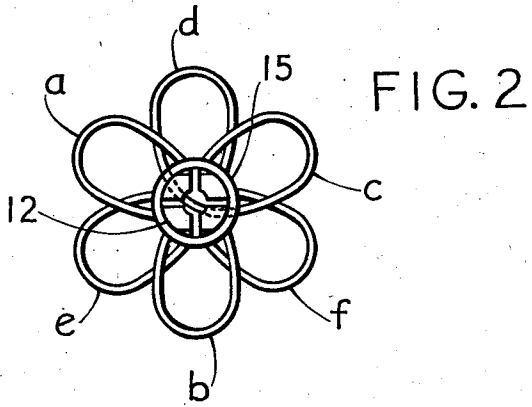
Jan. 6, 1948.

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2,433,955

PARAFFIN SCRAPER

Filed Nov. 13, 1944



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UNITED STATES PATENT OFFICE

2,433,955

PARAFFIN SCRAPER

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Application November 13, 1944; Serial No. 563,276

5 Claims. (Cl. 166-18)

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This invention relates to a scraper which is adapted to be traversed throughout a well tubing to remove paraffin, asphalt or other accumulations, and is particularly directed to a device which may be secured at any point along the length of a wire line and is additionally provided with outwardly extending loops formed from a continuous length of wire.

Heretofore, scrapers and others types of cleaners which are adapted to be run through a well tubing to remove deposits have been provided with radially extending wires and the like, the ends of which are adapted to scrape or cut the deposit so that it may be removed from the tubing by flushing with oil or other liquid. The manufacture of these devices entailed the fabrication of a great number of small wire elements and numerous fastening devices by which they were secured to the body of the unit so as to extend radially or tangentially outwardly therefrom.

This invention comprehends broadly the provision of an elongated body which may be solid or hollow and which is provided with a plurality of substantially transverse apertures desirably spaced throughout its length and also arranged circumferentially to receive a continuous length of wire which is threaded sequentially through the several apertures to form loops which are substantially transverse with respect to the body of the device and extend radially outwardly to remove the paraffin or other accumulation within the bore of the well tubing. Desirably, but not necessarily, the body is provided with a collet or other clamping means adapted to engage a wire line at any point along its length and to be released therefrom to move the scraper body to a new location or to detach it entirely. This is found to be particularly desirable where a wire line already is utilized for controlling various equipment in the well tubing, for example injection valves and the like, in which case the scraper may be placed at different locations to clean limited lengths of the tubing at the same time that the wire line is reciprocated to actuate the flow control or other device.

It is an object of this invention to provide a paraffin scraper or the like which utilizes a single continuous length of wire threaded sequentially through transverse apertures in the body to form loops which extend outwardly through the desired distance toward the inner wall of the tubing to be cleaned.

Another object is to provide a paraffin scraper which is particularly adapted to be placed at any desired point along a wire line, and, if its scraping

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action is not needed, the single continuous wire which forms the scraping means may be removed, leaving only the relatively small diameter body in place on the wire line.

Another object is to provide a paraffin scraper or the like in which the single wire which forms the cleaning or scraping means may readily be renewed without removing the body of the device from the wire line on which it may be mounted.

These and other objects and advantages will be further apparent from the following description and from the accompanying drawing which forms a part of the specification and illustrates a preferred embodiment of the invention.

Referring to the drawing: Figure 1 is a vertical and part sectional view of a scraper embodying this invention. Figure 2 is a plan view of the device shown in Figure 1. Figure 3 is a diagram of a template illustrating a desirable arrangement of apertures to facilitate threading the continuous wire to form the radial loops which constitute the scraping means.

In the drawing, reference numeral 10 designates generally an elongated body, which may be hollow as shown, or may be solid to impart added weight to the device, particularly where it is to be used at the lower end of a wire line rather than at an intermediate point thereon. The upper end of body 10 of this example is threaded internally as at 11 to receive a similarly threaded lower end of a collet chuck 12, the latter being provided with the customary longitudinal slots 13 and tapered section 14 which is received in a similarly tapered sleeve 15, the latter spaced by ring 16 from the clamping or tightening nut 17. Body 10 is adapted to seat against the lower face of nut 17 by rotating it with means such as a wrench which will engage the opposed flattened portions 18.

Referring now to Figure 3, which illustrates a template showing the developed outer surface of body 10, it will be noted that longitudinally and circumferentially spaced apertures 19 to 23, etc., are provided through the hollow body of this example. To facilitate the threading of the wire 25 successively or sequentially through the apertures 19 to 23, etc., when a hollow body is used, it will be further convenient, when drilling the odd-numbered holes, to incline the axis of the drill in the direction of the next even-numbered hole. When drilling the even numbered holes the drill should be inclined in the direction of the preceding odd-numbered hole.

Wire 25 is desirably made of spring steel, bronze, or similar suitable material, and may be round, flat or any desired cross-sectional config-

uration. Referring to Figure 2, it will be noted that the several loops *a*, *b*, *c*, *d*, *e*, and *f* are so adjusted that they overlap at least in part and extend outwardly substantially transversely at approximately right angles to the longitudinal axis of body 10. The ends 26 and 27 of wire 25 may be bent as shown or otherwise secured to prevent their pulling out of the apertures through which they pass.

In operation, and particularly if the scraper is to be utilized at a point intermediate the length of a wire line, the collet chuck 12 is tightened on the line at the desired point by rotating nut 17 with respect to chuck 12. Body 10 is then rotated on the threaded portion of chuck 12 until it seats securely against nut 17. Wire 25 may then be threaded sequentially through the several apertures 19 to 24, etc., the number of loops being determined by the degree of overlap desired or the amount of deposit to be removed at any one pass of the device. For example, if a very heavy deposit is encountered, only three loops may be desired which would radiate outwardly at 120° intervals around the circumference of the body. If the deposit is softer or more readily removable, six, nine or more loops may be used, with a suitable distribution pattern so that substantially all of the inner circumference of the tubing is covered by one or more loops at each pass.

Although means have been shown for adjusting body 10 at any intermediate point along a length of wire line it is obvious that a single eyelet for the end of the line could be substituted, particularly where the body of the device is made of a solid bar and has sufficient weight to pull itself and its support wire line downwardly through a deposit of paraffin.

Although a single embodiment of this device has been illustrated and described, it is obvious that numerous changes could be made in the arrangement of the continuous wire, the means of support and the like, without departing from the invention, and all such modifications and changes that come within the scope of the appended claims are embraced thereby.

I claim:

1. A scraper adapted to be secured to a wire

line or the like and moved thereby through a well tubing to remove paraffin and similar deposits from said tubing, characterized by an elongated body, a plurality of substantially transverse apertures extending through said body and longitudinally and circumferentially spaced therein, and a continuous length of wire threaded through said apertures to form loops extending outwardly from said body.

2. A scraper according to claim 1, in which said body is hollow to permit the support wire to extend axially therethrough.

3. A scraper according to claim 1, in which said body is hollow to permit the support wire to pass entirely therethrough, and includes a collet at one end for securing said body to said wire.

4. A scraper adapted to be secured to a wire line or the like and moved thereby through a well tubing to remove paraffin and similar deposits from said tubing, comprising a unitary elongated body, means forming longitudinally and circumferentially spaced transverse passages through said body, and a continuous length of flexible wire traversing said passages, those portions of said wire intermediate said passages forming overlapping loops outside of said body.

5. A scraper according to claim 4, in which said body is hollow to permit the support wire to extend axially therethrough and means on said body for selectively gripping said wire.

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