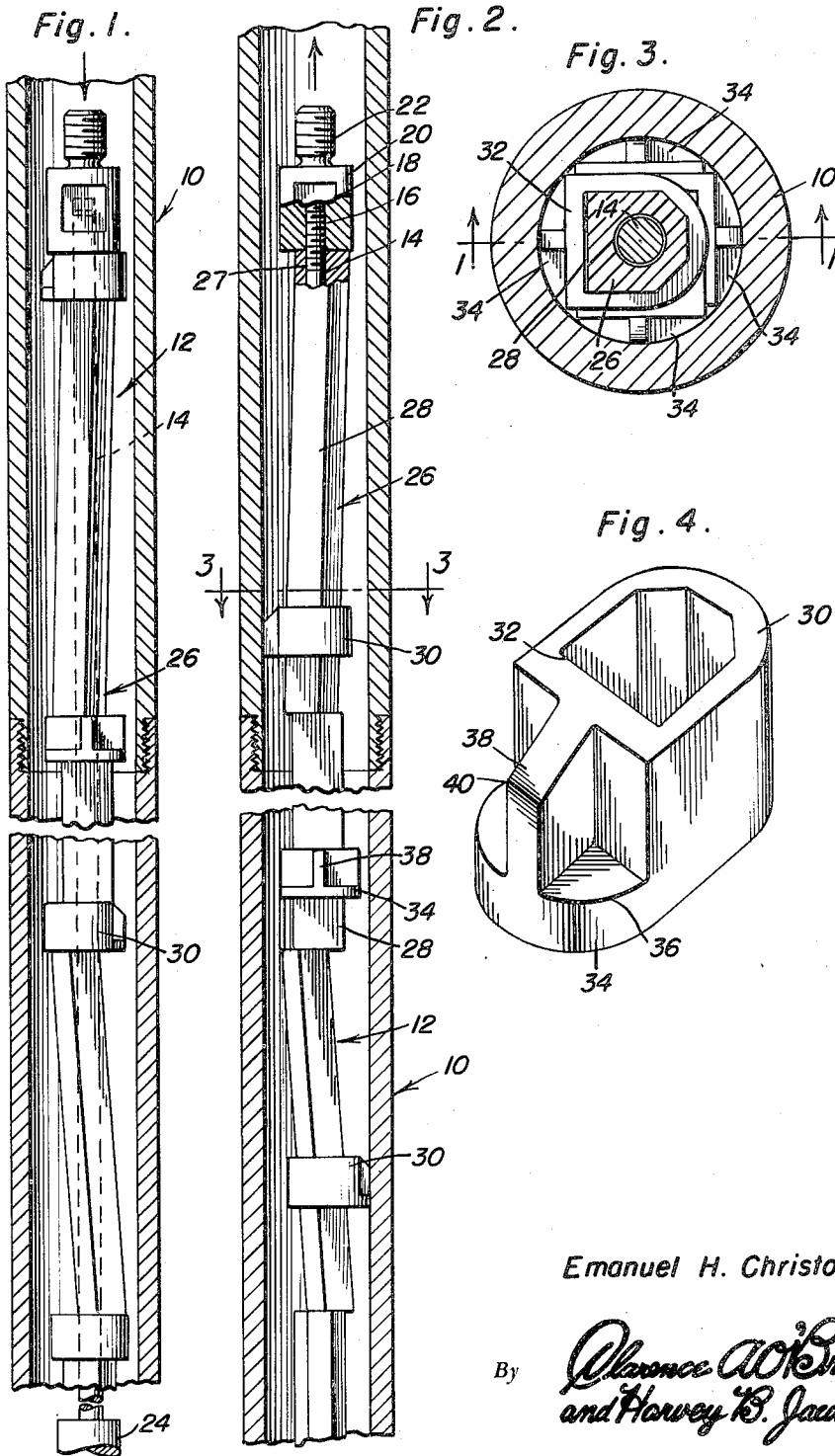


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E. H. CHRISTOPHER  
PARAFFIN SCRAPING DEVICE

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## UNITED STATES PATENT OFFICE

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## PARAFFIN SCRAPING DEVICE

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4 Claims. (Cl. 166—18)

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This invention relates to a well scraping device and is particularly designed for use in removing paraffin and other substances from the wall of the bore in well tubing.

A principal object of this invention is to remove the paraffin from the well tubing only on the upstroke, so that the paraffin is prevented from falling down into the well.

Another important object of this invention is to enable a plurality of vertically spaced scrapers to be lowered into a well tubing without contacting the side walls thereof and to automatically bring the scrapers into engagement of the side walls on the upstroke, so that the cutters or scrapers define a circular cutting knife, whereby the entire inner surface of the tubing is scraped.

Another important object of this invention is to provide an elongated supporting rod on which are disposed a plurality of slide members disposed in end-to-end relationship out of longitudinal alignment, each of the slide members being formed with an inwardly and upwardly inclined side wall, with respect to the longitudinal axis of the supporting rod, and to provide a plurality of scrapers which are slidably disposed on the slide members and which are formed with a side wall complementary to the inclined side wall of the slide members. Thus, when the supporting rod is lowered into the well tubing, the scrapers are frictionally held at the upper end of the slide members and the cutting portions of the scrapers which project laterally from the portion of the scraper complementary to the inclined side walls of the slide members are retained out of engagement with the side walls of the well tubing. However, upon the upstroke of the supporting rod, the cutting surfaces of the scrapers are brought into engagement of the well tubing. The side walls of the slide members which are inclined with respect to the longitudinal axis of the supporting rod are arranged at right angles to each other so that the scrapers supported on the slide members have their cutting surfaces fanned out at right angles to each other to define a circular cutting knife.

These and ancillary objects and structural features of merit are attained by this invention, a preferred embodiment of which is set forth in the following description, illustrated in the accompanying drawing, wherein:

Figure 1 is a vertical sectional view of a conventional well tubing, illustrating this invention being lowered therein;

Figure 2 is a similar view of the well tubing, depicting this invention in an upwardly moving position;

Figure 3 is a transverse sectional view taken on line 3—3 of Figure 2; and

Figure 4 is a view in perspective of the scraper or cutter instrument.

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Referring now to the drawing, the numeral 10 designates a well tubing or casing of any conventional cross-sectional diameter. This invention, generally designated by the character reference 12, is adapted to be lowered and raised in the bore of the casing or tubing and is adapted to completely remove paraffin or other substances adhering to the inner surface of the casing.

The scraping device, 12, includes an elongated supporting or connecting rod 14, which is formed with an externally threaded upper end 16. The end 16 is inserted in an internally threaded socket 18 formed in a coupling collar 20. The collar 20 is provided at its opposing end with an externally threaded, axially reduced extension 22, the latter being adapted to be secured to conventional sucker rods.

An enlarged end 24 is formed on the lower end of the rod and is adapted to be lowered into the casing. A plurality of blocks or slide members 26 are arranged in end-to-end relationship between the collar 20 and the enlarged end 24. Any number of slide members may be provided and the length or other dimension thereof may be as desired or needed.

The slide members are formed with longitudinally disposed angular bores 27, the slide members being bored off-center with respect to the longitudinal axis thereof. Thus, when the slide members are strung in a series on the supporting rod, each of the slide members is out of longitudinal alignment with the adjacent slide member. The slide members are formed with a non-circular outer surface and each is provided with an upwardly and inwardly inclined side wall 28, the side wall 28 being inclined with respect to the longitudinal axis of the supporting rod 14. Each of the slide members is positioned and locked on the supporting rod, so that the inclined face 28 thereof is disposed at right angles to the inclined side wall or face on adjacent members.

A sleeve 30 is slidably and non-rotatably disposed on the non-circular outer surface of the slide members, the sleeve being formed with a side wall 32, which is complementary to the inclined side wall 28 on each of the slide members. A semi-circular integral cutter 34 projects laterally from the lower edge of the outer surface of the wall 32 of the sleeve and the upper edge 36 thereof is sharpened. A reinforcing, vertically disposed web 38 is disposed integrally between the upper face of the cutter 34 and the outer surface of the wall 32. If desired, the connecting or rigidifying web 38 may have its angular portion 40 sharpened for scraping contact with the inner surface of the casing.

Each of the slide members 26 is provided with a slidably and non-rotatably disposed sleeve 30, from which integrally projects the cutter 34. The slide members 26 are disposed in an end-to-end

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relationship on the connecting or supporting rod 14, so that the inclined side walls 28 thereof are disposed at right angles to each other. Thus, the cutters 34 are carried by the slide members in a manner to define a circular, continuous cutter, as seen in Figure 3.

When the cutting device 12 is lowered in the casing, through sucker rods supporting the connecting or supporting rod 16, the sleeves 30 will be moved upwardly on the slide members and the side walls 32 of the sleeves will be positioned at the upper, innermost portion of the inclined side walls 28. Thus, the cutting edges 36 of the cutters 34 will be held out of contact with the inner surface of the casing.

However, when the device is moved upwardly in the casing, the sleeves will slide downwardly on the slide members and the cutters 34 will be held in frictional engagement on the inner surface of the casing, with the cutting edges 36 thereof in scraping contact with the inner surface of the casing.

It must be appreciated that the upstroke of the device removes the paraffin or similar substance from the inner surface of the casing for the free flow of oil from the well, while the downstroke of the device will not remove any paraffin or similar substance, and thus will avoid scraping the paraffin into the well.

However, since other purposes can be established for the instant scraping device, and since other embodiments may be practiced, limitation is sought only in accordance with the terms of the appended claims.

Having described the invention, what is claimed as new is:

1. A scraping device comprising a supporting rod, a plurality of adjacent slide members disposed on said rod and arranged in end-to-end engagement, each of said slide members being formed with an upwardly and inwardly inclined side wall with respect to the longitudinal axis of the supporting rod, said side wall of each member being arranged at a right angle to the side wall of the adjacent member, and scrapers slidably and non-rotatably disposed on said slide members, each of said scrapers including an internal wall engaging the side wall of each of said slide members.

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2. A well scraping device comprising a supporting rod, a plurality of non-circular slide members disposed on said rod and arranged in end-to-end relationship out of longitudinal alignment, each of said slide members being formed with an inwardly and upwardly inclined side wall with respect to the longitudinal axis of the rod, sleeves slidably and non-rotatably disposed on said slide members and cutting means laterally projecting from the portion of the sleeves disposed on the inclined side walls.

3. A well scraping device comprising a supporting rod, a plurality of non-circular slide members disposed on said rod and arranged in end-to-end relationship out of longitudinal alignment, each of said slide members being formed with an upwardly and inwardly inclined side wall, said side walls being arranged at right angles to each other, sleeves slidably and non-rotatably disposed on said slide members and formed with a side wall complementary to the inclined side walls and laterally projecting cutting means integrally formed on the said side walls of the sleeves.

4. A well scraping device comprising a supporting rod, a plurality of non-circular slide members disposed on said rod and arranged in end-to-end relationship out of longitudinal alignment, each of said slide members being formed with an upwardly and inwardly inclined side wall, said side walls being arranged at right angles to each other, sleeves slidably and non-rotatably disposed on said slide members and formed with a side wall complementary to the inclined side walls and semi-circular reinforced cutters integrally formed on the said side walls of the sleeves and projecting laterally therefrom.

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