F. J. ROGERS.

WELL CLEANING DEVICE.

APPLICATION FILED MAY 24, 1920.

1,423,625.

Patented July 25, 1922.

2 SHEETS—SHEET 1.

Fig. I.

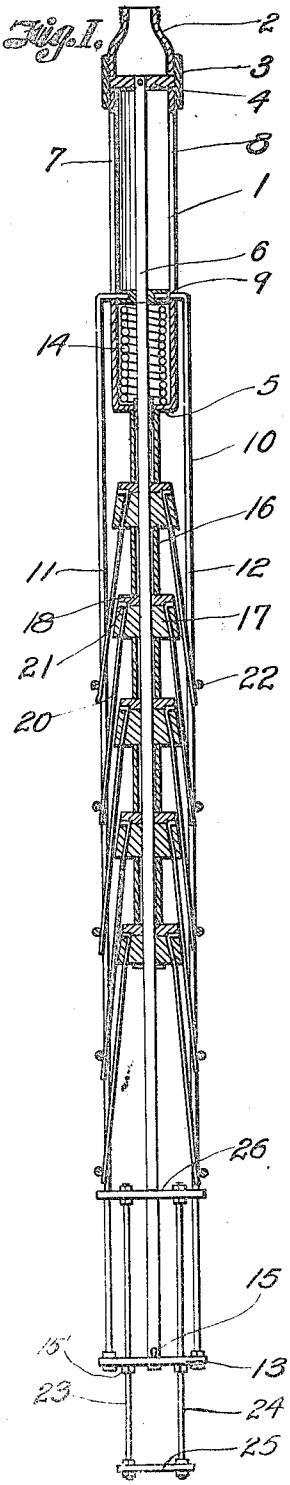


Fig. II.

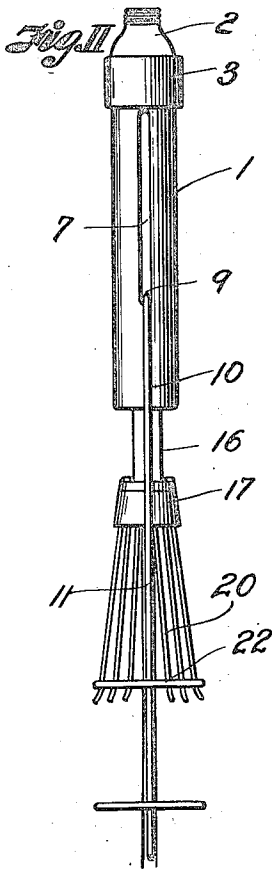


Fig. III.

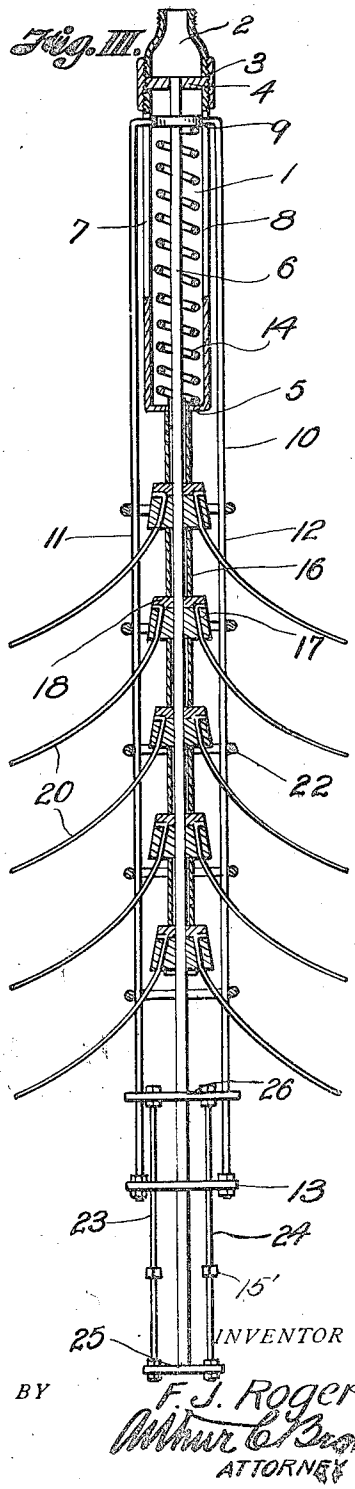
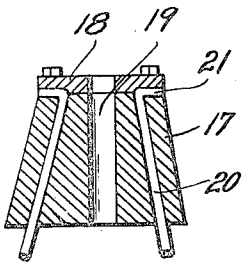


Fig. IV.



INVENTOR

BY F. J. Rogers

Arthur C. Brown

ATTORNEY

F. J. ROGERS.

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2 SHEETS—SHEET 2.

Fig. V.

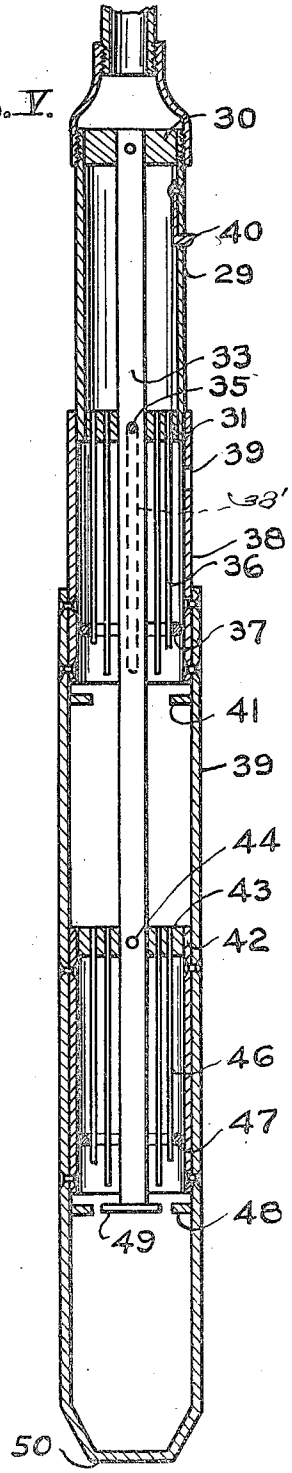
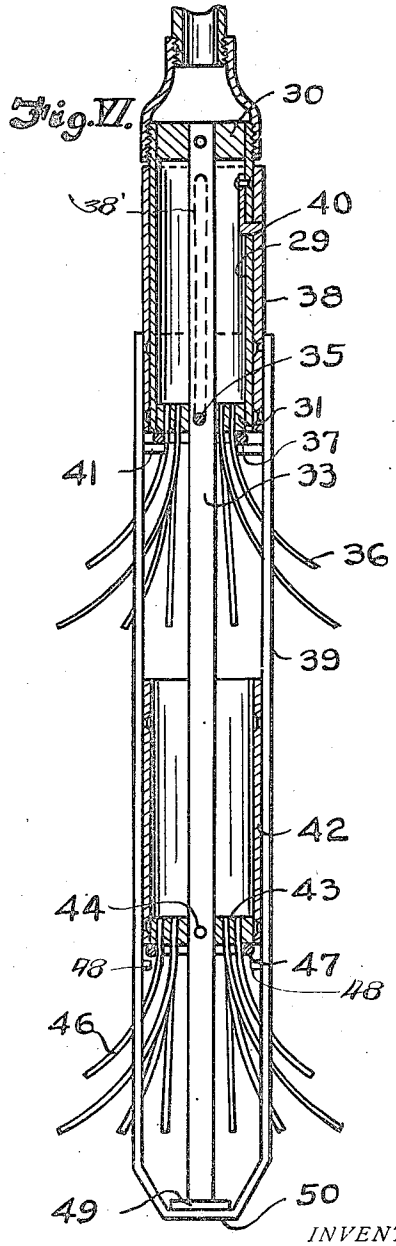


Fig. VI.



INVENTOR

F. J. Rogers.

BY Arthur C. Brooms

ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK JASPER ROGERS, OF INDEPENDENCE, KANSAS.

WELL-CLEANING DEVICE.

1,423,625. Specification of Letters Patent. Patented July 25, 1922.

Application filed May 24, 1920. Serial No. 383,619.

To all whom it may concern:

Be it known that I, FRANK JASPER ROGERS, a citizen of the United States, residing at Independence, in the county of Montgomery and State of Kansas, have invented certain new and useful Improvements in Well-Cleaning Devices; and I do 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 the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to oil well cleaners and reamers, and one of the objects thereof is to provide a device which may operate on the principle of a rotary brush so as to remove objectionable matter from the sides of the oil well as well as to cut away the sand to make a basin for the oil.

Another object of the invention is to provide a device which may be readily lowered into the well, after which certain brushing elements may be released to extend outwardly about the axis of the device so that when the device is rotated, a brushing effect may take place.

In the drawings,

Fig. I is a vertical, longitudinal, sectional view of an oil well cleaner constructed in accordance with my invention and ready for insertion into the well.

Fig. II is a fragmentary, elevational view of the device at right angles to Fig. I.

Fig. III is a vertical, longitudinal, sectional view of the device ready for use.

Fig. IV is a sectional view through one of the heads.

Fig. V is a vertical, sectional view through a modified form of the invention, the brush elements being retracted, and

Fig. VI is a similar view showing the brush elements extended but the brush releasing members collapsed the yoke being shown in section.

Referring now to the drawings by numerals of reference:

1 designates a barrel or casing provided with an attaching neck 2, by means of which a pipe or other suitable device may be attached to lower the cleaner into the well. The neck is fastened to the barrel by a collar 3. The barrel or casing 1 is provided at the upper end with an abutment 4 and at its lower end with a similar abutment 5, there being a longitudinally extending rod or bar 6 passing through the abutment 5 and into the abutment 4, as shown in Figs. I and III.

The barrel or casing 1 is provided with oppositely disposed slits 7 and 8, through which projects the upper portion 9 of a yoke 10. The yoke is shown as consisting of an elongated loop having the end member 9, side bars 11 and 12 and a lower cross bar 13. The end members 9 and 13 of the yoke are slidably mounted upon the elongated rod or bar 6 and interposed between the end member 9 and the abutment 5 is a coil spring 14, the expansive force of which is sufficient to impart a longitudinal movement to the yoke 10 so that the end member 9 will be guided in the slots 7 and 8. The yoke is held in its retracted position, however, with the spring 14 under compression, as shown in Fig. I, through the medium of a transversely extending wooden pin 15, which projects through the rod or bar 6 near its lower end and against which abuts the bar 13 so as to oppose a longitudinal movement of the yoke in an upward direction. Therefore, the spring 14 can only expand when the pin 15 ceases to oppose an upward movement of the bar 13. The means for accomplishing this will be described hereinafter.

Alternating with sleeves 16 on the rod or bar 6 and beneath the barrel or casing 1 are heads, consisting of blocks 17 provided with clamping plates 18, the longitudinal openings 19 being for the reception of the rod 6. The heads carry flexible arms preferably of spring metal having a normal tendency to swing outward and these arms are designated by the reference numeral 20. The ends of the arms are bent at substantially right angles to the body portion thereof, as shown at 21, so that they can be clamped to the heads by means of the plates 18. The spring arms 20, however, are normally retracted against moving outward through the medium of rings 22, in spaced relation on the yoke 10. The rings are so disposed that when the parts are in the position shown in Fig. I they will slide over the spring arms 20 to hold them in their retracted positions, as shown in Fig. I, but when the yoke-shaped member 20 moves longitudinally of the rod or bar 6, the rings are moved toward the heads 17 or out of embracing contact with the arms so that the arms may swing into

position, as shown in Fig. III. As heretofore explained, however, there can be no longitudinal movement of the yoke 10 to release the arms unless the pin 15 is sheared so as to allow the bar 13 to move longitudinally on the rod or bar 6. In order to insure the proper shearing of the pin 15 at the proper time, I have provided a frame for the plate 13 comprising the side bars 23 and 24, which pass through the bar 13 and carry at their respective ends the cross bars 25 and 26. The bar 26 is slidable upon the shaft or bar 6 and through it project the side bars 11 and 12.

When the parts are assembled as shown in Fig. I and the device is lowered into the well, the brushes or arms will remain in their retracted position until the cleaner strikes the bottom of the well; that is, until the bar 25 comes in contact with the bottom of the well thereby the weight of the yoke 10 and the pipe to which it is connected will cause the frame, consisting of the side bars 23 and 24 and the bars 25 and 26, to telescope with respect to the yoke 10 until stops 15′ on the side bars 23 and 24 engage the bar 13, whereupon movement of the yoke 10 will cease but movement of the bar 6 may continue to shear the pin 15. Then the spring 14 may expand, forcing the yoke 10 upwardly and longitudinally of the rod or bar 6. As the yoke completes its longitudinal movement, the rings 22 will be moved away from contact with the spring arms 20, allowing them to expand, as shown in Fig. III, whereupon the device will be ready for use.

In Figs. V and VI I have shown a slightly modified form of device in which a barrel 29 is provided with an upper head 30 and a lower head 31, the latter being provided with an opening through which projects a rod or bar 33 fixed to the head 30, the projecting portion of the rod 33 being provided with a pin 35 on head 31. The head 31 is also provided with outwardly projecting spring arms 36, normally confined by the ring 37 in sleeve 38, which is provided with an opening 39′ to engage a latch 40 on barrel 29. The lower end of the sleeve 38 is fastened to a yoke 39 having inwardly projecting lugs 41 adapted to lie in the path of the ring 37 and said yoke carries a tubular member 42 having a head 43 with a pin 44. The head 43 also carries outwardly projecting arms 46 and these arms are provided with a confining ring 47 adapted to contact with lugs 48 on yoke 39.

When the parts are properly assembled and introduced into the well, the continued downward pressure on the barrel 29 will cause barrel 29 and sleeve 38 to telescope until the opening 39′ is engaged by the latch 40. This will cause the ring 37 to be slid upon the arms 36, as shown in Fig. VI and permit the arms to expand outwardly as shown. At the same time, the ring 47 contacting with pins 48 as the head 43 slides within the member 42, will permit the arms 46 to expand outwardly, the longitudinal movement of the several elements being limited by the foot 49 contacting with the end of the stirrup 50. The device may be operated substantially similarly to that in the form shown in Figs. I to IV, both inclusive. The pin 35 may extend through at each side of the head 31 and engage in slots 38′ in the sleeve 38 to slidably key the sleeve 38 to the barrel 29 to retain the sleeve in operative position.

From the foregoing it will be seen that I have provided a well cleaning device which is simple in construction, which may be readily assembled, and which may be conveniently operated to perform the service intended.

Having thus described my invention what I claim as new therein, and desire to secure by Letters-Patent is:

1. A well cleaning device comprising a tubular member, a rod connected to the tubular member, a plurality of flexible arms connected to said rod, the free ends of which have a tendency to expand outwardly, a yoke slidable with respect to the tubular member, and means carried by the yoke for engaging the free ends of the flexible arms when the yoke is at the limit of one movement with respect to said tubular member and for releasing the free ends of said arms to permit them to expand when the yoke is at the limit of its movement in an opposite direction.

2. A well cleaning device comprising a plurality of flexible arms mounted about a common center, an encircling means for normally holding the free ends of said flexible arms in retracted position, and means for imparting movement to the encircling means to free the ends of said arms to permit them to swing outward.

3. A well cleaning device comprising a tubular member, a yoke slidably connected to said tubular member, a rod extending from the tubular member within the yoke, a group of flexible arms, each rigidly connected to the rod and each arm having a free end adapted to spring outwardly, means connected to the yoke for encircling the free ends of said arms, and means for imparting a sliding movement of the yoke with respect to the tubular member to cause the encircling means to release said arms.

4. A well cleaning device comprising a tubular member, a yoke having slotted engagement therewith, a spring between the yoke and the tubular member having a normal tendency to impart relative sliding movement between the yoke and the tubular member, means for normally holding the

spring in retracted position, a rod carried by the tubular member and between the sides of the yoke, heads carried by the rod, flexible arms carried by the heads and having free ends adapted to swing outwardly, and retracting means carried by the yoke and normally holding the free ends of said arms in retracted position.

5. A well cleaning device comprising two members, one of which has movement with respect to the other, means for exerting movement of one of the members with respect to the other in one direction, means for normally opposing such movement, outwardly swinging arms normally retracted but releasable upon movement of one of the movable members with respect to the other to swing outwardly.

6. A well cleaning device comprising a rod, flexible arms mounted about the rod, a yoke having means for normally holding the arms in retracted position, and means for imparting movement to said yoke to release said arms.

7. A well cleaning device comprising a rod, spring arms carried by said rod, a yoke-shaped member slidable on said rod and having means for engagement with the spring arms, means for normally urging the yoke-shaped member longitudinally of the rod to effect releasing of the arms, means for normally holding the yoke-shaped member against such longitudinal movement, and ground-engaging means for releasing the last named means.

8. In a well cleaning device, a cylinder or casing, a rod co-axial with and rigid with respect to said casing, a yoke slidable on said rod, a spring normally urging said yoke in one direction, spring arms carried by the rod, means on the yoke for normally retracting the arms about the axis of the rod, a pin carried by the rod for holding the yoke in position to compress the spring to prevent moving of the yoke in one direction, and a ground-engaging pin-shearing device carried by the yoke.

In testimony whereof I affix my signature.

FRANK JASPER ROGERS.