

Jan. 4, 1927.

1,613,066

R. J. TURNER

SWAB

Filed Nov. 9, 1925

Fig. 1.

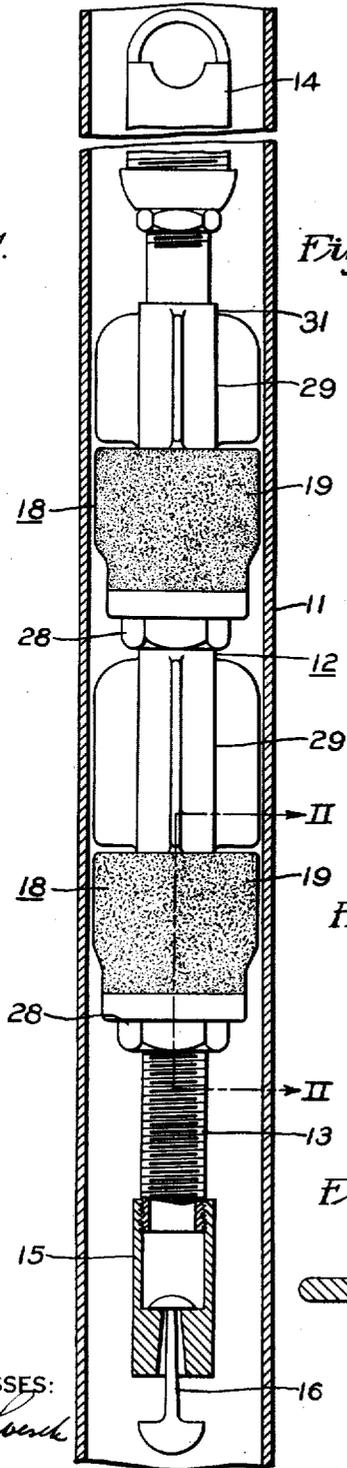


Fig. 2.

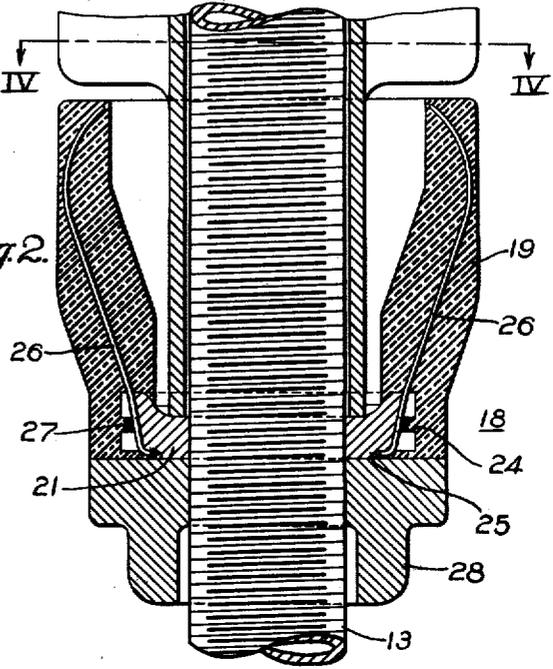


Fig. 3.

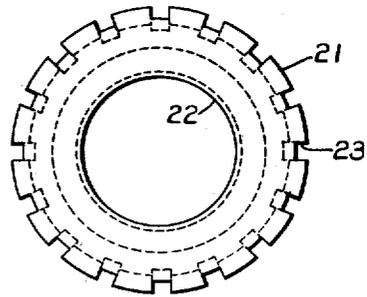
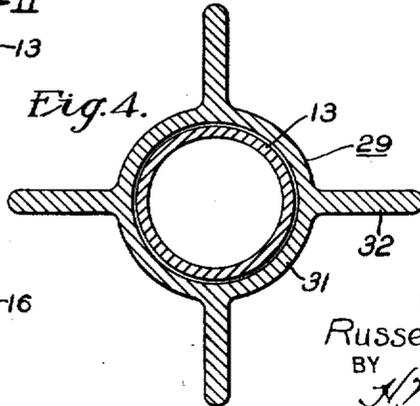


Fig. 4.



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RUSSELL J. TURNER, OF BUTLER, PENNSYLVANIA, ASSIGNOR TO GUIBERSON CORPORATION, OF DALLAS, TEXAS, A CORPORATION OF DELAWARE.

SWAB.

Application filed November 9, 1925. Serial No. 67,747.

My invention relates to accessory devices for oil well operation and particularly to swabs.

One object of my invention is to provide a relatively simple, inexpensive, and highly efficient swab for use in oil wells, that shall embody a minimum number of parts.

Another object of my invention is to provide a cup assembly for a swab comprising a minimum number of individual members.

In practicing my invention, I provide a central pipe upon which are mounted a plurality of upwardly flaring cups of resilient material molded on a base ring, and within which are embedded a plurality of resilient members. Means are provided on the pipe for spacing a plurality of cup assemblies apart and for guiding the swab in a conduit when in operation.

In the single sheet of drawings,

Figure 1 is a view, partially in side elevation and partially in vertical section, of a device embodying my invention,

Fig. 2 is a partial sectional view thereof, taken on the line II—II of Fig. 1,

Fig. 3 is a top plan view of a base ring comprising a part of the device embodying my invention, and

Fig. 4 is a view in lateral section, taken on the line IV—IV of Fig. 2.

Fig. 1 of the drawing illustrates a part of an outer casing 11, such as is usually employed in oil wells, and having located therein a swab assembly 12. The swab 12 comprises an inner pipe member 13 that has a relatively large portion of its lower part screw-threaded, as shown in Figs. 1 and 2. The pipe member 13 is provided with a top member 14, that has screw-threaded engagement with the upper end of the pipe 13, and constitutes a bail to permit of operating the swab by moving it up and down in the casing 11, in a manner well known in the art. A short length of conduit 15 has screw-threaded engagement with the lower end of the pipe member 13, and is so formed, at its lower portion, as to constitute a seat for a valve member 16.

A cup assembly 18 comprises an upwardly flaring cup member 19, of resilient material and preferably consisting of rubber or of a rubber compound, together with some material to ensure the proper hardness and wearing qualities thereof. A base ring 21 constitutes a part of the cup assembly, and has

screw threads on its inner surface 22 that permit of mounting it on the central pipe member 13. The ring member 21 is provided with a plurality of laterally-extending, relatively narrow grooves 23 that are located in spaced relation around the periphery of the ring member. The grooves 23 are deeper at the lower edge portion of the base ring 21 than at the upper edge of the base ring. The ring member 21 is also provided with a peripherally extending groove 24 intermediate its edges, and is further provided with a lower shoulder portion 25.

A plurality of resilient members 26, that are of substantially the form shown in Fig. 2 of the drawing, have their lower end portions located in the respective grooves 23. A part of the lower end portion of each of the members 26 is bent over at substantially a right angle, as shown more particularly in Fig. 2 of the drawing. In building up the cup assembly the resilient members 26 are temporarily held in place in the grooves 23, until all of the resilient members have been placed in the proper operative positions, after which a plurality of turns of wire 27 are placed in the groove 24 in order to hold the resilient members 26 firmly against the base ring 21. The bent over end portion hereinbefore described effectively prevents any upward movement of the resilient members 26.

After the resilient members have been mounted on the base ring, it is placed in a suitable mold and a quantity of a raw rubber compound is placed in proper operative position in the mold, and is then subjected to the usual curing process. The mold comprises properly formed inner and outer portions, so that the shape of the upwardly flaring cup member 19 will be substantially that shown in Fig. 2 of the drawing, the lower portion thereof being molded around the upper surface of the base ring, and around the outer peripheral surface thereof. The shape of the resilient members 26 is such that the upper portions thereof extend to within a very small distance of the outer peripheral surface of the cup member 19, while the upper ends thereof extend inwardly thereof substantially as shown in Fig. 2 of the drawings.

In order to hold the cup assembly in a predetermined position on the central pipe

member 13, I provide a locking ring 28, whose inner surface is screw-threaded to permit of threading it on the pipe 13, so that its upper surface will engage the lower surface of the base ring 21. The ring 28 will also effectively prevent any downward movement of the resilient members 26, should they become loose on the base ring and tend to move downwardly.

A plurality of guiding and spacing members 29 are provided, and severally comprise an annular portion 31 with a plurality of spaced integral and radially extending portions 32. The general shape of the member 29 is that of a skeleton, when viewed in lateral section. I may locate a spacing and guiding member 29 immediately below the bail 14, and then locate a cup assembly 18 so that the upper shouldered surface of the base ring 21 is in engagement with the lower end portion of the annular part 31 of the spacing member. A second member 29 is located immediately below the lock nut 28 of the upper cup assembly, and a second cup assembly 18 is located therebelow, the entire structure being that shown in Fig. 1 of the drawing. While I have shown two cup assemblies only it is obvious that any desired number of such cup assemblies may be employed one above another, the length of the central pipe member 13 being such as to permit of mounting thereon the desired number of cup assemblies and of spacing and guiding members.

The operation of the device is obvious from the description, when used to clean out a well after the casing has been inserted therein. It is only necessary to secure the bail of the swab to a rope or cable and to let it down to the desired depth in the casing. The assembly will be guided by the members 29 which are made so that their lateral or diametral dimensions are somewhat less than the internal diameter of the casing in which they are to operate. Should the cup members 19 meet with any small obstruction while being lowered their resilient character will permit of easily passing such obstruction and then returning to their original shape. Upon raising the swab by means of the rope or cable a certain amount of fluid will be caught and retained by the resilient cups, and they will expand to some extent, so that substantially all or at least a great part of the fluid within the casing 11 that happens to be located above the swab will be raised therewith. The operation of lowering the swab and of raising the same may be repeated as often as necessary, until the casing has been cleaned as desired.

The device embodying my invention, and particularly the cup assembly, embodies a relatively small number of parts, and as the resilient members are embedded in the rub-

ber, they will be available to hold the upwardly flaring cup in proper operative position. The outer curved portions of the upper parts of the resilient members will tend to prevent any further wear of the outer surface of the cup assembly after the wear has been sufficient to remove the rubber outside of the resilient portions. As the resilient members 26 are relatively narrow and flat they will soon wear to a rounded outer surface at that part where they come in contact with the casing, so that a substantially water-tight joint will be effected even after the cup member 19 has become somewhat worn. The resilient members 26 are substantially symmetrically located radially of the cup member 19, substantially equal amounts of resilient material being on each side thereof, ensuring that the resilient members shall be embedded and held properly within the resilient material. The resilient members will be effective until the entire cup has been worn down to such an extent as to make it unusable because of the wear on the rubber.

The outer diameter of the cup members 19 is substantially the same as the diametral dimension of the members 32 on the guides 29, and hence no excessive stresses can be placed on the cup members 19 during operation of the swab by any obstruction that may be in the casing.

Various modifications may be made in the device embodying my invention without departing from the spirit and scope thereof, and I desire that all such modifications shall be included in the appended claims which are to be limited only by the prior art.

I claim as my invention:—

1. In a swab, a supporting member, a base ring immovable on said support, a cup of flexible material moulded on the base ring, and independent resilient stiffening members separate from the ring embedded in said cup and engaging said ring at their lower ends.
2. In a swab, a supporting member, a flexible cup having a free lip at its upper end, means for securing the cup on the support, and a plurality of resilient members embedded in the cup, the upper ends of said members being curved inwardly at the top of the cup and having their lower ends bent inwardly, and a base member overhanging the lower bent ends of the resilient members.
3. In a swab, a cup assembly comprising a laterally grooved metal base ring, a plurality of resilient members having end portion located in the respective grooves and secured to the ring, and a cup of flexible material within which the resilient members and a portion of said metal ring are embedded.
4. In a swab, a cup assembly comprising a base ring having a plurality of lateral grooves in its outer surface, a plurality of resilient members, each having a portion lo-

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cated in a groove and having an end portion thereof bent over the end surface of said ring, means for securing said resilient members against said ring, and a cup of flexible material within which the resilient members and a portion of the ring are embedded.

5. In a swab, an externally threaded pipe, a base ring screwed thereon and having a plurality of lateral grooves in its outer surface, a plurality of resilient members, each having a portion located in one of said grooves and embodying means co-operating with said ring for preventing movement of said resilient members in one direction relatively to said ring, means for securing said resilient members against said ring, a flaring cup of flexible material embedding the resilient members and a portion of the ring, and a locking ring screwed on said pipe for holding said base ring in proper operative

position on said pipe and for precluding movement of said resilient members in the other direction relatively to said ring.

6. In a swab, a central pipe, a plurality of upwardly flaring cups of flexible material on said pipe, and a combined spacing and guiding means on said pipe intermediate said cups and spaced from said cups.

7. In a swab for a conduit, a central pipe, a plurality of upwardly flaring cups of flexible material on said pipe, and a member, of skeleton shape in cross-section, on said pipe for spacing said cups from one another and for guiding the swab when introduced into a conduit.

In testimony whereof, I have hereunto subscribed my name this 3rd day of November, 1925.

RUSSELL J. TURNER.

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5. In a swab, an externally threaded pipe, a base ring screwed thereon and having a plurality of lateral grooves in its outer surface, a plurality of resilient members, each having a portion located in one of said grooves and embodying means co-operating with said ring for preventing movement of said resilient members in one direction relatively to said ring, means for securing said resilient members against said ring, a flaring cup of flexible material embedding the resilient members and a portion of the ring, and a locking ring screwed on said pipe for holding said base ring in proper operative

position on said pipe and for precluding movement of said resilient members in the other direction relatively to said ring.

6. In a swab, a central pipe, a plurality of upwardly flaring cups of flexible material on said pipe, and a combined spacing and guiding means on said pipe intermediate said cups and spaced from said cups.

7. In a swab for a conduit, a central pipe, a plurality of upwardly flaring cups of flexible material on said pipe, and a member, of skeleton shape in cross-section, on said pipe for spacing said cups from one another and for guiding the swab when introduced into a conduit.

In testimony whereof, I have hereunto subscribed my name this 3rd day of November, 1925.

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CERTIFICATE OF CORRECTION.

Patent No. 1,613,066, granted January 4, 1927.

to RUSSELL J. TURNER.

It is hereby certified that the assignee in the above mentioned patent was erroneously described and specified as Guiberson Corporation, whereas said assignee should have been described and specified as The Guiberson Corporation, as shown by the records of assignments in this office; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 22nd day of February, A. D. 1927.

Seal.

M. J. Moore,
Acting Commissioner of Patents.

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