Feb. 25, 1958 J. G. BURCH 2,824,611

SOLUBLE CHEMICAL DEPOSITOR AND METHOD OF RELEASING

Filed Oct. 28, 1955

Fig. 1.

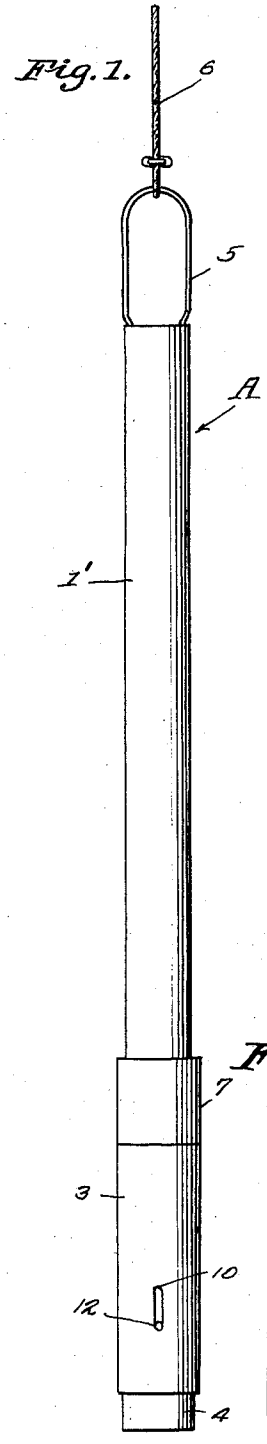


Fig. 2.

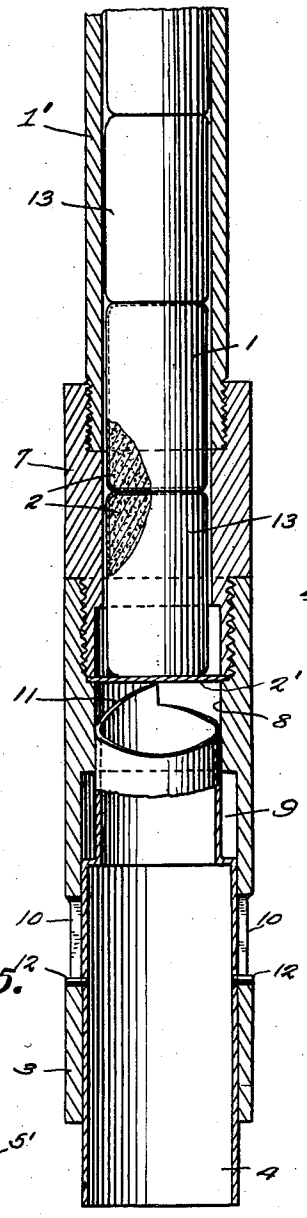


Fig. 4.

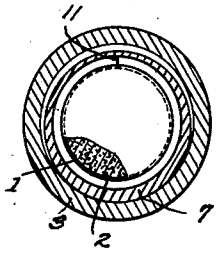


Fig. 3.

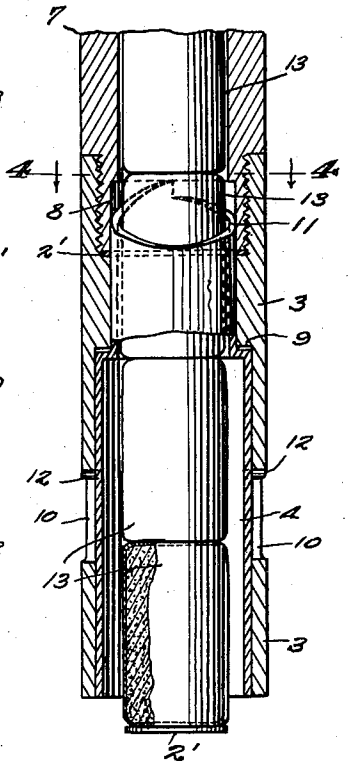
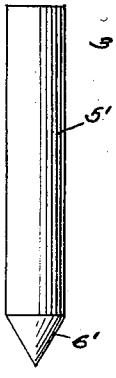


Fig. 5.



Julius G. Burch

INVENTOR

BY C. A. Snow & Co.

ATTORNEYS.

United States Patent Office 2,824,611 Patented Feb. 25, 1958

2,824,611

SOLUBLE CHEMICAL DEPOSITOR AND METHOD OF RELEASING

Julius Gordon Burch, Borger, Tex.

Application October 28, 1955, Serial No. 543,530

1 Claim. (Cl. 166—38)

This invention relates to a soluble chemical depositor and method of releasing in inaccessible places and to certain novel features therein. This device is particularly adapted for use in or at the bottom of oil wells, which are subject to fouling with consequent interference with the flow and pumping operations.

Heretofore, much difficulty has been experienced in keeping the oil wells flowing, especially the ones that are low and require pumps located at the bottom to lift the oil.

These wells accumulate paraffin, asphaltic deposits, salt and dirt crusts, which also clog the pumps and tools. These must be withdrawn for cleaning and overhaul. It is also necessary to dislodge these accumulations, reduce them to sludge, and pump this out. All pumps must be open at the bottom to receive oil. After the pump has been withdrawn for cleaning and overhaul, trouble is encountered in relowering the pump into the well pipe, unless the pipe is first cleaned of accumulations. These accumulations will many times peel into the pump rendering it ineffective to lift oil.

It is therefore the primary object of the present invention to provide a quantity of material for dissolving these accumulations which is so packaged that the package containing the material may be readily lowered into an oil or gas well to the desired depth for the work needed, the material being lowered to the desired depth in a dry and clean condition to insure the potential usefulness of the material.

It is another object of the present invention to provide a material for dissolving accumulations in a well that may be used on open end pumps or other mechanical tools to hood (or cover) the opening in such a way that the pump or mechanical tools may be readily lowered through the clogging, damaging substances into an oil well to the desired depth for the work needed, in a clean, unclogged condition to insure the potential usefulness of the tools.

Another object of the invention is to produce a package containing the desired dissolving material wherein the chemical containers are thin walled and formed of material such as gelatin which when contacting liquid in the well will dissolve and release the material at the point of accumulations to be removed, without loss or dilution of the material or premature heating due to the chemical reaction.

A further object is to produce a device for doing this effectively, simply, and without leaving any residues which will retard the flow of oil or be difficult to remove.

Other objects and advantages of the invention will become apparent in the body of the specification and claim.

One embodiment of the invention including the method employed is herein described and illustrated.

In the drawings:

Fig. 1 is an elevation of my chemical depositor ready for use.

Fig. 2 is an enlarged elevation in section of the lower part of my chemical depositor, with pacakaged chemicals, positioned for application in a well.

Fig. 3 is the same as Fig. 2, after rupture of the retaining disc, and

Fig. 4 is an enlarged plan view of Fig. 1 in section along line 4—4 of Fig. 3.

Fig. 5 is an enlarged elevational view of a package containing chemicals for generating heat, the package having a pointed end.

Many devices and methods have been tried or used to remove these deposits, but none has been entirely acceptable for any of many reasons. Mechanically operated paraffin cutting tools, such as the spirally-cut guide coupling have been used.

Chemically generated heat has been found desirable, as described in the method of U. S. Patent No. 1,351,945 of September 7, 1920, to Mr. John R. Dulany. However, this method is uncertain, wasteful and results in loss, premature heating and dilution as the caustic ingredients are poured into the well. This method also subjects the operators to too much danger of physical injury.

My method and device for its use, disclosed and claimed herein are a distinct improvement over that of this U. S. Patent No. 1,351,945 cited above. My invention provides for the deposit of packaged chemicals dry and intact at the site of accumulations, where they quickly react with the surrounding liquid to produce heat. This heat with the solvent action of the caustic reduces accumulations to a sludge which is pumped out without difficulty or danger to the personnel.

The packages constituting the subject matter of the present invention comprise casings **1**, each casing being formed of material such as gelatin used in medicinal capsules, which is readily soluble in water.

A mixture of heat producing solvent chemicals **2** such as lye or caustic are completely encased in such solvent casing, so that the chemicals contained therein may be carried to the desired level and location within the well, to the end that the material will be delivered clean and dry at the desired depth so that when the casing is dissolved, the heat producing chemicals will be liberated at the proper location to obtain the maximum potential usefulness, thereby preventing waste which results from the pouring of the heat producing chemicals into a well at the top thereof and allowing the materials to fall where they will. With this method, the chemicals collect on the wall of the well where they are not needed and consequenty wasted.

My soluble chemical depositor A, Fig. 1, is composed essentially of hollow tube **1'**, disc **2'**, trip bottom **3**, and disc cutter **4**. The tube **1'** is open at the top, and has a bale **5** fixed thereto for attachment of a conveyor line **6**. The lower end is externally threaded to connect to a hollow pipe section for an extension of length or directly to adaptor **7**. The adaptor **7** is externally threaded at its lower end for a threaded connection to a trip bottom **3**. The cylindrical bore of adaptor **7** is the same as that of tube **1'**, except at its lower end, which is enlarged to receive the end of disc cutter **4**.

Trip bottom **3** has a cylindrical bore **8** in its upper end section equal to or slightly less than the enlarged lower bore of adaptor **7**. Below this, the bore is enlarged at **9** forming a shoulder. Midway of the length of the enlarged bore **9** are opposed longitudinal slots **10** extending through the wall of trip bottom **3**. Mounted within the trip bottom **3** is disc cutter **4**, composed of two cylindrical sections, open from end to end. The upper section slides in bore **8**, and constitutes the disc shear **11**, the sharp end of which is shaped as one turn of a helix. The lower section is enlarged to fit bore **9** in which it slides. A shoulder joins the two sections. Midway of the length of the lower section are two outwardly projecting guide pins **12**, which slide in slots **10**.

In the upper end of the trip bottom **3**, nested against

the shoulder formed at the base of the threaded section is the replaceable disc 2', held in position when the adaptor and trip bottom are threaded together. Disc 2' is formed of soluble material, strong but softer than disc shear 11, such as aluminum for example. The length of slots 10 is the same as that of the longitudinal length of the enlarged bore of adaptor 7. The guide pins are placed on the disc cutter 4, so that they are at the bottom of slots 10, Fig. 2, with disc shear 11 in contact with disc 2' and the disc cutter 4 extending out of the end of trip bottom a distance the length of slots 10. In the form of the invention as shown by Fig. 5, the container 5' is formed with a pointed end 6' for guiding a package through the well tubing.

The pointed container has been designed for literally dropping the soluble material, packed with heat giving chemicals, into the oil well, relying upon its differential in weight to that of well fluid to submerge to well bottom.

Use and operation

The chemical depositor A is loaded by unthreading trip bottom 3 from adaptor 7 and filling tube 1' with the packaged chemicals. The disc 2' is placed in the upper end of trip bottom 3, with disc shear 11 down, before it is threaded onto the end of adaptor 7. As seen in Fig. 2, the soluble chemical depositor A is now ready for use. The conveyor line 6 is attached to the bale 7 and runs from a hoisting reel over a rig or portable mast or may be serviced from a portable reel through pulleys to align with the well. It is then lowered to position in the well, where the weight of the depositor A pressing down on disc cutter 4 causes disc shear 11 to cut through disc 2', as it moves upwardly into the enlarged bore of adaptor 7. The cut out from the disc 2' drops down along with packages 13 which are released as the depositor is raised and withdrawn for reloading.

One embodiment of the invention and the method used has been disclosed herein, in detail. However, various modifications of the invention may be made within the scope of the appended claim.

I claim:

A means for unclogging a clogged well comprising a cylindrical water soluble gelatin casing closed at each end, caustic soda in said casing, a tubular depositor having a slot therin for said casing, a frangible inner wall in said depositor providing a bottom support for said casing, a wall puncturing member loose in said depositor below said wall, a cylindrical slide fixed relative to said puncturing member and projecting below said depositor whereby contact of said slide with the well bottom will effect movement of said puncturing member relative to said depositor to thereby puncture said wall, a pin on said slide engaging in said slot for retaining said slide in slidable related assembly with said tubular depositor, said casing gravitatingly dropping downwardly to the well bottom, said depositor upon being raised upwardly effecting the exposing of said casing to the action of the liquid in the well whereby said casing will dissolve and the caustic soda will generate a solid melting heat.

References Cited in the file of this patent

UNITED STATES PATENTS

1,807,819	Altgelt	June 2, 1931
2,100,684	Carroll	Nov. 30, 1937
2,173,683	Goldfarb et al.	Sept. 19, 1939
2,228,629	Jarrell	Jan. 14, 1941
2,366,373	Voorhees	Jan. 2, 1945
2,454,740	Lehnhard	Nov. 23, 1948
2,635,400	Abbott et al.	Apr. 21, 1953
2,635,996	Rohrback et al.	Apr. 21, 1953