L. H. SARGENT.

WELL CLEANER.

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1,345,555.

Patented July 6, 1920.

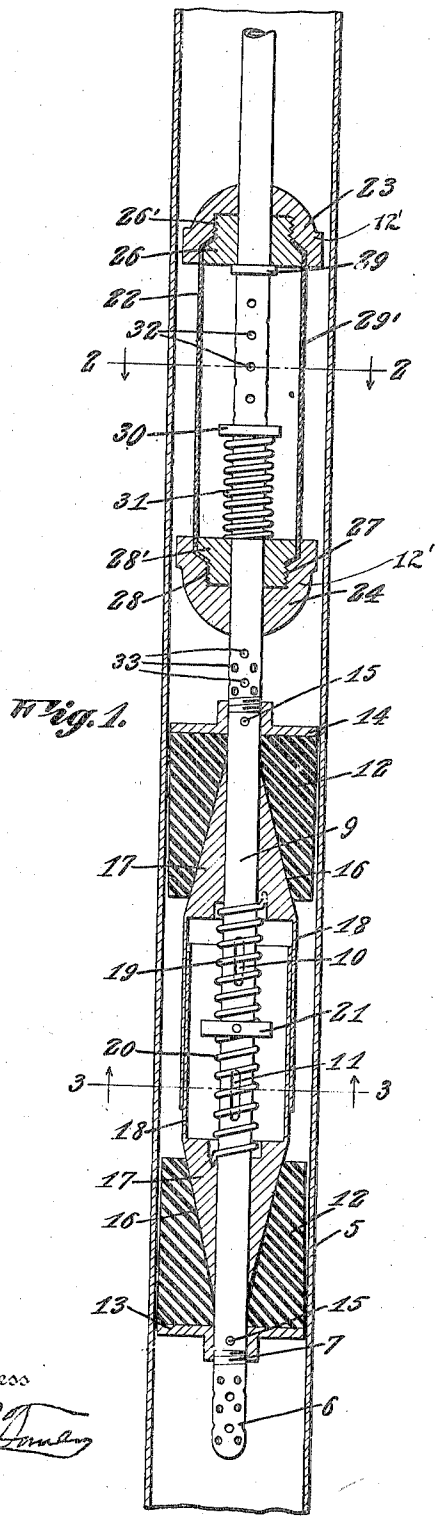


Fig. 1.

Fig. 2.

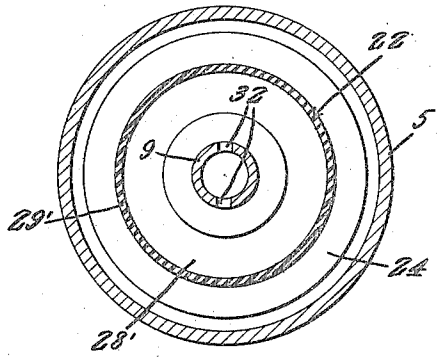
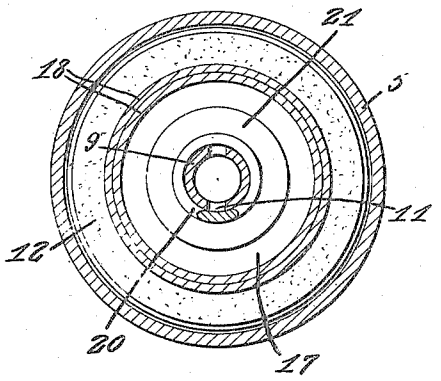


Fig. 3.



Witness

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LEMUEL H. SARGENT, OF FORT WORTH, TEXAS.

WELL-CLEANER.

1,345,555. Specification of Letters Patent. Patented July 6, 1920.

Application filed October 18, 1919. Serial No. 331,574.

To all whom it may concern:

Be it known that I, LEMUEL H. SARGENT, a citizen of the United States, residing at Fort Worth, in the county of Tarrant and State of Texas, have invented a new and useful Well-Cleaner, of which the following is a specification.

This invention relates to an improved well cleaner, and has for its principal object to provide a device of this kind adapted to be positioned in a well casing to direct a volume of air into the casing for cleaning the valves and straining elements thereof.

A further object of the invention is to provide an automatic means for sealing the well casing above the nozzle of the cleaner for holding the fluid within the well casing, against back pressure, during the cleaning operation.

A still further object of the invention is to automatically release the sealing means when the pressure within the cleaning tube is relieved.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein described may be made without departing from the spirit of the invention.

Referring now to the drawing:

Figure 1 illustrates a longitudinal sectional view of a well casing with a well cleaner constructed in accordance with my invention inserted therein.

Fig. 2 illustrates a transverse sectional view taken on line 2—2 of Fig. 1.

Fig. 3 illustrates a transverse sectional view taken on line 3—3 of Fig. 1.

Referring to the drawing in detail, the numeral 5 indicates a well casing provided with the ordinary screens and valves, not shown.

The cleaner proper, includes a supply pipe 9 and a nozzle 6 threaded at one of its ends as at 7 and coöperating with internal threads not shown on one end of the supply pipe 9 for removably securing the nozzle 6 to said pipe. The supply pipe 9 is provided with elongated openings 10 and 11, for purposes to be hereinafter more fully described.

Supported on the supply pipe 9 and above the nozzle 6, are expansible relatively long rubber valve members 12 the same being held against movement, longitudinally of the supply pipe 9 by means of the disks 13 and 14 secured on the supply pipe 9, as at 15.

Each of the valve members 12 and 12′ is provided with an internal opening, the openings in the members 12 being conical as at 16, the walls of which are adapted to be engaged by the conical wedging members 17, which as shown, are movable longitudinally of the supply pipe 9. Each of the wedging members 17, carries at one end thereof, a cylindrical drum 18, one of said drums being of a greater diameter than the other so that one drum 18 overlaps the other, as clearly shown by Fig. 1, of the drawing to permit movement of one drum with relation to the other.

Disposed within the cylindrical drums 18, and between the conical wedging members 17, are coiled spring members 19 and 20, which have one of their respective ends connected to the stationary disk 21, the opposite ends of said springs 19 and 20 being anchored to the respective wedging members 17, the action of said coil springs being to normally hold the wedging members 17 disengaged from the valve members 12.

Disposed above the valve members 12, is a sealing member 22, which includes end members 23 and 24, the end member 23 being mounted on the supply pipe 9 and held against longitudinal movement thereon, in one direction by means of the washer 29, anchored to the supply pipe 9, and against which the clamping member 26 abuts, the clamping member 26, being connected with the end member 23 by means of the threaded connection 26′.

The lower end member 24 is mounted to slide on the supply pipe 9, and is also interiorly screw threaded as at 27 to receive the threaded portion 28 of the coöperating clamping member 28′.

The valve member disposed above the valve member 12 includes the tubular member 29′, which is formed of expansible material, such as rubber, leather or the like, and has its ends clamped between the end members 23 and 24, and their respective clamping members, thereby firmly securing the ends of the valve member 29′, against displacement, when pressure is directed thereon. The washer 29 against which one

of the members 26 abuts is secured on the supply pipe 9 to restrict longitudinal movement in one direction of the clamping member 26.

A washer 30 is also anchored on the supply pipe 9, and provides an anchoring means for one end of the coiled spring 31, the opposite end thereof having connection with the lower clamping member 28′ for holding said end member 24 in its normal position after pressure has been relieved.

Formed in the wall of the supply pipe 9, and disposed between the washers 29 and 30, are openings 32 which discharge fluid, under pressure within the tubular valve member 28 for expanding the same against the interior walls of the well casing 5, and at the same time move the upper and lower clamping members 26 into clamping engagement with the ends of the valve member 28, to prevent the fluid from escaping at the top of the well casing during the cleaning operation.

Openings 33 are formed in the supply pipe 9 directly above the upper valve member 12, which openings allow excess pressure of fluid to escape, into the casing, and thereby cutting or washing out any paraffin, asphalt, sand or other material from the screen or perforations in the well casing which might prevent oil or other fluid entering the well casing from the outside of the screen or perforations.

The operation of the device is as follows. The cleaner is positioned within the well casing, so that the discharge nozzle 6 is located with proper relation to the sand screen and valves, not shown, to efficiently discharge fluid thereon, to facilitate the cleaning thereof.

Fluid under pressure enters the upper end of the supply pipe, with the result that the fluid exhausts through the openings of the supply pipe 6, thereby expanding the flexible valve 28 against the interior wall of the well casing and forming a seal for the cleaner, to insure constant pressure against the screens and valves being cleaned.

During the cleaning operation, fluid under pressure also passes through the elongated openings 10 and 11, and it follows that fluid fills the space between the wedging members 17, with the result that the wedging members are forced into coöperative relation with the valve members 12, against the tension of the coiled springs 19, thereby forcing the valve members 12 into engagement with the well casing 6. When pressure in the supply pipe 9 is relieved, the valve members are moved to their normal positions by the coiled springs 19, 20, and 31.

From the foregoing it will be seen that a complete seal of the well casing is provided during the cleaning operation, thereby preventing back pressure and insuring the cleaning result.

What is claimed is:

1. A well cleaner including a supply pipe having a nozzle at one end thereof, an upper sealing valve and a lower sealing valve disposed on the supply pipe, the lower sealing valve including an upper expansible member and a lower expansible member, each of said expansible members having a tapering opening formed therein, opposed wedging members disposed within the tapering openings, cylindrical drums having connection with the wedging members, said cylindrical drums having communication with the supply pipe for directing fluid pressure to the drums for causing the wedging members to expand the expansible valve members.

2. A well cleaner including a supply pipe, a nozzle on one end of the supply pipe, a sealing valve including expansible valve members having internal conical openings, cone-shaped wedge members adapted to engage within the conical openings of the valve members for expanding the valve members into engagement with the well casing, said supply pipe having openings to direct fluid under pressure to said cone-shaped wedge members and an expansive sealing member positioned above the sealing valve.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witneseses.

LEMUEL H. SARGENT.

Witnesses:

JNO. S. MORRIS,

J. H. PRICE.