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CLEANING DEVICE FOR WELLS.

APPLICATION FILED MAY 31, 1916. RENEWED MAY 14, 1917.

1,230,666. Patented June 19, 1917.

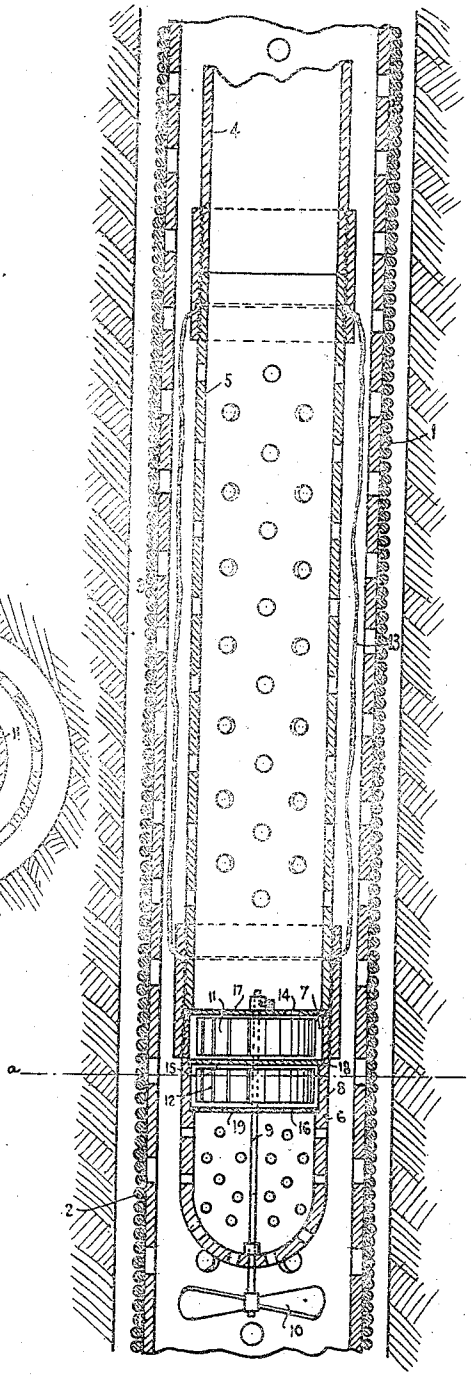


FIG. 1

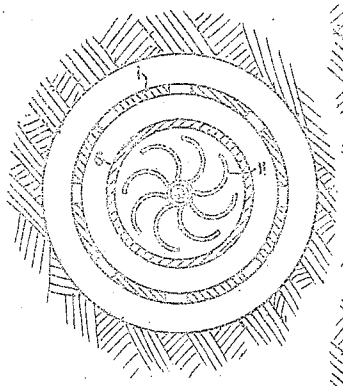


FIG. 2

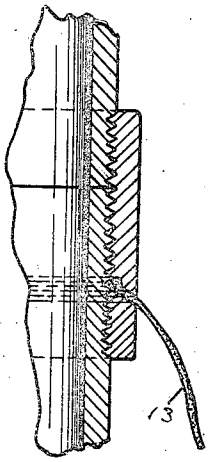


FIG. 3.

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CLEANING DEVICE FOR WELLS.

1,230,666. Specification of Letters Patent. Patented June 19, 1917.

Application filed May 31, 1916. Serial No. 100,748. Renewed May 14, 1917. Serial No. 168,598.

To all whom it may concern:

Be it known that I, DAVID A. CARDEN, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Cleaning Devices for Wells, of which the following is a specification.

This invention relates to new and useful improvements in a cleaning device for wells, and is particularly adapted for the purpose of the washing out of the well screen after it has been set in the bore.

Well screens now in most common use are formed of perforated pipe, usually wrapped with screen wire, the turns of which are spaced apart, and as the screen is lowered into the bore the slits between the turns of wire become clogged and filled with sand and dirt, and after the screen is set it must be washed out by forcing water under pressure down within the screen and through the slits between the turns of wire. The object of this invention is to provide a device for the purpose of washing out the screen when it has become, for any reason, clogged.

With the above and other objects in view the invention has particular relation to certain novel features of construction, operation and arrangement of parts an example of which is given in this specification and illustrated in the accompanying drawings, wherein:—

Figure 1, is a vertical sectional view of the device.

Fig. 2, is a transverse sectional view thereof, and

Fig. 3, is a fragmentary vertical sectional view thereof.

Referring now more particularly to the drawings the numeral 1 indicates a well screen which is formed of perforated pipe wrapped with screen wire 2, the turns of which are spaced apart. This screen is set in the bore and there is usually a space 3 between the screen and the wall of the bore. The oil flows in through the slits between the screen wire 2, from the surrounding reservoir into the interior of the screen. However, in setting the screen the slits between the turns of wire often become clogged with sand and other detritus and before the oil can enter the screen said screen must be washed out and cleaned. For the purpose of accomplishing this object a pipe 4 is lowered into the well within the screen, the lower end of this pipe having a perforated section attached thereto of any desired length and attached to the lower end of this section is a hood 6, the upper end of which has a plurality of inclosed compartments as 7 and 8 and the lower part of which is provided with a plurality of perforations. A vertical shaft 9 is rotatably mounted in suitable bearings in the hood and its lower end projects below said hood and fixed to said end of the shaft is the agitator 10 formed of radiating vanes angularly disposed relative to the axis of rotation. Fixed to the shaft 9 within the respective compartments 7 and 8 are the turbine wheels 11 and 12 by means of which rotation is imparted to said shaft. The section 5 is surrounded by a sleeve 13 formed of tough fabric, leather, rubber or some other suitable flexible material and its ends are secured to the corresponding ends of said section in any approved manner so as to form water tight joints.

The device is gradually lowered into the screen and water is forced down through the pipe 4 by means of a force pump located at the surface. The perforations of the section 5 have a greater capacity than those of the hood 6 and a portion of the water passes through the first mentioned perforations and forces the flexible sleeve 13 out against the inner walls of the screen on all sides forming a water tight joint with said screen preventing the passage of water between the screen and the section 5. The remainder of the water passes through the orifices 14, 15 and 16, provided in the upper end 17 and the partitions 18 and 19, of the hood respectively, said orifices being arranged in staggered relation both vertically and horizontally, the current of water passing through the compartments 7 and 8 and operating against the turbines 11 and 12 and rotating them in the same direction. The water passes thence through the orifices in the lower end of the hood 6 and out through the screen 1 and then up along the space 3 and enters the screen above the sleeve 13. This current of water being under strong pressure washes out the slits between the turns of wire and as the device is gradually lowered washes out and cleanses the screen. As the device is lowered

the agitator 10 stirs up the sand and other detritus which may collect in the screen and the same is carried by the water current up out of the bore and delivered to the surface.

As the device is lowered in the screen from time to time the water pressure may be cut off or lowered so as to decrease the friction between the sleeve 13 and screen 1 to prevent the rupture of said sleeve or injury thereto.

What I claim is:—

1. A device of the character described including a perforated pipe section, a surrounding sleeve formed of flexible material attached at its respective ends to the corresponding ends of said section, and a perforated hood attached to one end of said section.

2. A device of the character described including a perforated pipe section, a surrounding sleeve formed of flexible material attached at its respective ends to the corresponding ends of said section, a perforated hood attached to one end of said section, and a rotatable agitator carried by said hood.

3. A device of the character described including a perforated pipe section, a surrounding sleeve formed of flexible material attached at its respective ends to the corresponding ends of said section, a perforated hood carried by one end of said section, an agitator, a turbine within the hood and operatively connected with said agitator and rotating the same.

4. A device of the character described including a perforated pipe section, a surrounding sleeve formed of flexible material attached at its respective ends to the corresponding ends of said section, a perforated hood carried by one end of said section, an agitator, a shaft rotatably mounted in suitable bearings in the hood to the outer end of which the agitator is fixed and a turbine fixed upon said shaft within the hood and rotated by the water passing through said hood.

5. A device of the character described including a perforated pipe section, a surrounding sleeve formed of flexible material attached at its respective ends to the corresponding ends of said section, a perforated hood carried by one end of said section, an agitator, a shaft rotatably mounted in suitable bearings in the hood to the outer end of which the agitator is fixed and a plurality of turbines fixed upon said shaft within the hood and rotated by the water passing through said hood.

In testimony whereof I have signed my name to this specification in the presence of a subscribing witness.

DAVID A. CARDEN.

Witness:
A. C. SPRINGFIELD.