F. A. FLANEGIN.

DEVICE FOR CLEANING OIL WELLS.

APPLICATION FILED SEPT. 30, 1907.

901,287. **Patented Oct. 13, 1908.**

2 SHEETS—SHEET 1.

Fig. 1.

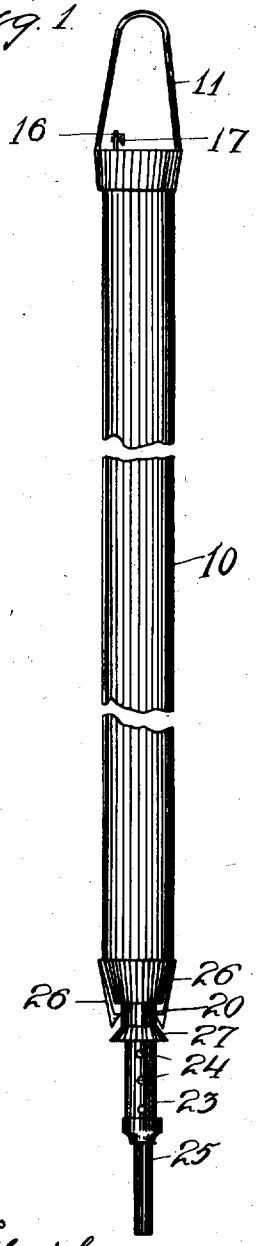


Fig. 2.

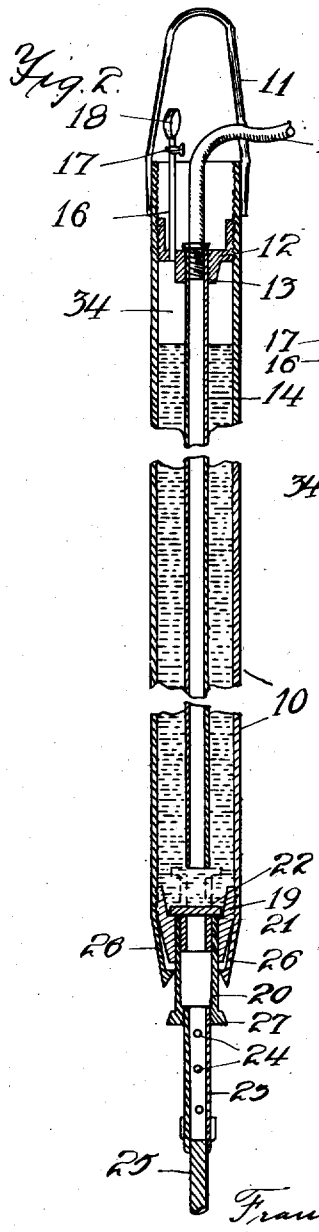
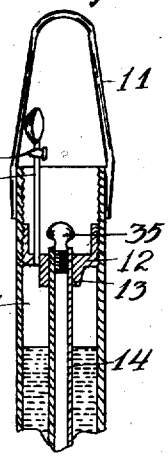


Fig. 12.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

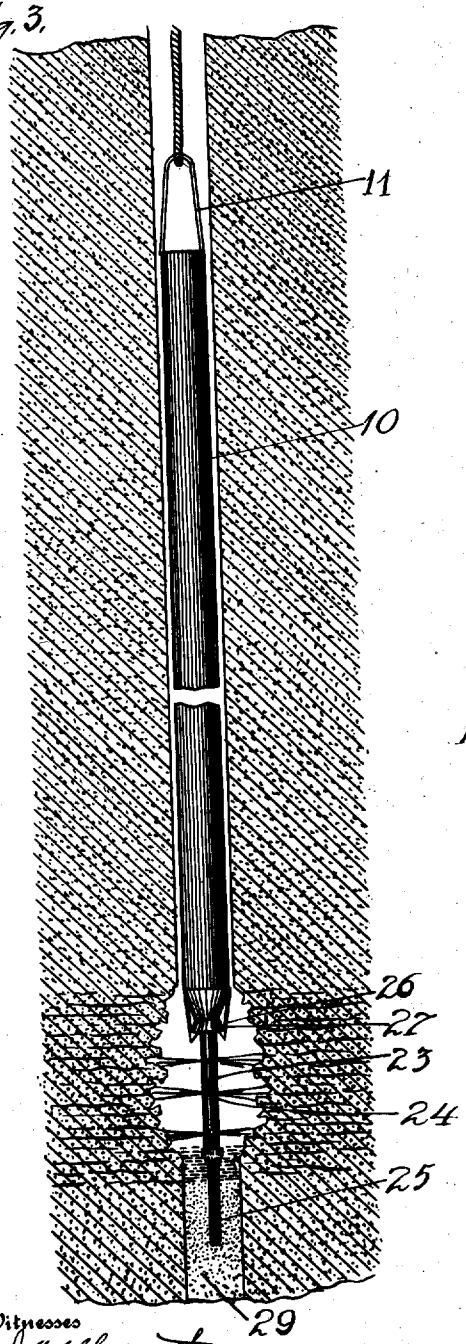


Fig. 4.

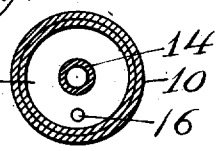


Fig. 5.

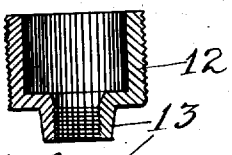


Fig. 6.

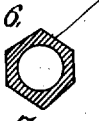


Fig. 9.

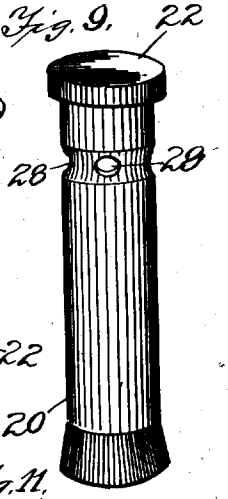


Fig. 7.

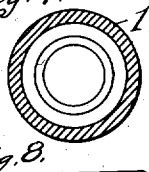


Fig. 8.

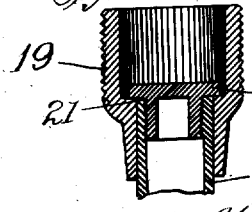


Fig. 10.

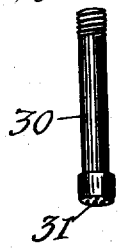
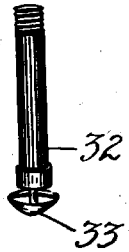


Fig. 11.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANCIS A. FLANEGIN, OF CHAUTAUQUA, NEW YORK.

DEVICE FOR CLEANING OIL-WELLS.

No. 901,287. Specification of Letters Patent. Patented Oct. 13, 1908.

Application filed September 30, 1907. Serial No. 395,058.

To all whom it may concern:

Be it known that I, FRANCIS A. FLANEGIN, a citizen of the United States, and resident of Chautauqua, in the county of Chautauqua and State of New York, have invented new and useful Improvements in Devices for Cleaning Oil-Wells, of which the following, taken in connection with the accompanying drawing, is a full, clear, and exact description.

The invention relates to devices for cleaning or renewing oil wells. It was at first supposed that the deposits of paraffin in the interstices of the rock in the shot cavity or oil producing portion of the rock was the cause of stoppage of oil flow. Experience has shown, however, that there are harder substances in a majority of the wells than in the paraffin and other deposits than from the oil, such as floating sand and other foreign substances as well as a thin formation of gypsum, which in some instances seems to coat the entire wall of the shot cavity with a thin formation which is exceedingly hard and upon which heat has very little or no influence. It is also found that the pocket at the bottom of the well, which pocket usually extends below the shot cavity, becomes filled with a deposit of sand and other foreign substances, which, being coated or saturated with the gypsum and paraffin, become hardened so that the bailer or sand pump has no effect upon them.

The object of the present invention is to provide means for discharging hot fluid, preferably under both hydraulic and pneumatic pressure, against the walls of the shot cavity with such force as to dislodge the hardened coating, the fluid also being heated dissolves the paraffin and other substances which are melted by heat; second, to provide a nozzle for the lower end of the device by means of which the entire hydro-pneumatic force of the hot fluid may be driven straight down into the pocket at the bottom of the well, thereby dissolving or agitating the hardened sand at the bottom of the well so that it can be withdrawn by the sand pump or bailer.

In the drawings, Figure 1 is a side elevation of the cleaning device, the central portion being broken away. Fig. 2 is a vertical sectional view of the cleaner showing the construction of the parts. Fig. 3 is a sectional view of an oil well with the cleaner in operation therein. Fig. 4 is a crosswise sectional view of the upper closure cap of the tubular case and central tube. Fig. 5 is a diametrally vertical sectional view of the upper closure cap. Fig. 6 is a crosswise sectional view of the lower end of the upper closure cap, showing a hexagonal form for a wrench. Fig. 7 is a crosswise sectional view of the lower closure cap for valve piece; and Fig. 8 is a vertical sectional view of said valve piece or closure for the lower end of the tubular case. Fig. 9 is a perspective view of the valve tube at the lower end of the cleaning tube. Fig. 10 is a perspective view of a nozzle for directing the fluid toward the bottom of the well. Fig. 11 is a nozzle for directing the fluid upward from below, as for example, where pockets are blown out or have obstructions therein, upon which the force of the fluid must come from the lower side. Fig. 12 is a vertical view of the top portion of the cleaner, showing the filling tube removed and the screw plug inserted.

Similar numerals refer to corresponding parts in the several views.

The numeral 10 indicates the tubular reservoir, in which the fluid is placed, which tube preferably has a bail 11 at its upper end for attaching the supporting line.

The upper end of tube 10 is closed by a metal plug 12 which is preferably threaded on its outer side to be entered in a corresponding thread within the tube 10. Central of plug 12 is a downward projection 13 into which is screwed the pipe 14. The upper end of pipe 14 is also threaded on its interior to receive the intake tube 15 which is screwed into the same in order to charge the tubular reservoir 10. Pipe 14 extends nearly to the bottom of tubular reservoir 10. A vent tube 16 is provided in plug 12 at one side of central pipe 14 which vent tube is controlled by valve 17 and has a thread cut on its upper end for the attachment of a pressure gage 18 while filling the tubular reservoir 10. The lower end of tube 10 is closed by means of a circular screw plug 19 which has a central opening within which the tubular valve piece 20 is slidably mounted, which plug 19 has a seat 21 for the valve head 22 on its inner side. A tubular nozzle 23 having small side vents 24 is usually screwed into the lower end of tubular valve piece 20, the lower end of tubular nozzle 23 being closed by a long rod 25 which operates the valve. The spring

catches 26 are attached to the outside of plug 19 and extend down below the same. A beveled projection 27 is provided on the lower end of tubular valve piece 20 so that when rod 25 presses against the bottom of the well the tubular valve piece 20 will be pressed upward into the reservoir 10 until projection 27 is engaged by spring catches 26, thereby holding the tubular valve piece in the raised position. In this raised position the openings 28 are raised above the valve seat 21 so that the fluid in reservoir 10 may escape through said openings 28 into tubular valve piece 20 and thence down into nozzle 23 and out of vents 24.

When it is desired to direct the fluid downward into the pocket 29 at the bottom of the well a nozzle 30 is screwed into valve piece 20, which nozzle 30 has the perforations 31 in the lower end, which jets the water directly against the hardened sand in the pocket 29 at the bottom of the well. When it is desired to shoot the water upward from the underside of some obstruction at the side of the cavity, the nozzle 32 is screwed into valve piece 20. Nozzle 32 has the concave or cup-shaped piece 33 attached to its lower end so that as the fluid strikes into the cavity it is forced out in all directions at an upward angle.

In operating this cleaner it is inserted in the top of the well and supported there ready for filling the reservoir 10, the pipe 15 having first been inserted and the gage 18 having been screwed on to vent pipe 16. The hot fluid is then forced under pressure into reservoir 10 through pipe 15 and tube 14 which carries the fluid to the bottom of the reservoir 10 and the force of the fluid will compress the air in the cylindrical reservoir 10 to the upper portion leaving an air space 34 at the upper end of the cylinder. When the desired pressure is obtained on the fluid as indicated by the gage 18, the tube 15 is removed and a plug 35 is screwed into the upper end of closure 12, though this plug is not necessary except under extreme high pressure since the pipe 14 extending nearly to the bottom of the reservoir and the liquid extending up above the same will preserve the pressure about said pipe. It is apparent that in a tube from forty to fifty feet long such as is intended for this purpose, the fluid within the reservoir 10 will have a strong hydraulic pressure, and also the pneumatic pressure which will jet the fluid out upon the sides of the shot cavity with great force. As soon as the reservoir is filled the valve 17 is closed and the gage 18 removed, after which the cleaner may be lowered to the bottom of the well by means of a suitable line and reel. As soon as the tripping rod 25 strikes the bottom of the well is will push upward on valve 22 until catches 26 engage projection 27, thereby allowing the fluid to be forced out on the sides of the well. After the valve is raised upon the catches 26 the cleaner may be raised and lowered to different portions of the well and thus the entire lower end of the well may be thoroughly cleaned and rinsed.

I claim as new:—

1. An oil well cleaner comprising a tubular reservoir for fluid and means for filling the same, a valve in the lower end of said reservoir, and a tubular nozzle attached to said valve having an extension to form a trip.

2. An oil well cleaner comprising a tubular reservoir for fluid and means for filling the same, a tubular valve in the lower end of said reservoir and means for opening the same, and a nozzle attached to said valve.

3. An oil well cleaner comprising a tubular reservoir and means for filling the same, an egress valve at the lower end of said reservoir and means for opening the same at the lower end of a well, and a nozzle on said egress valve having a plurality of openings for the fluid.

4. An oil well cleaner comprising a tubular reservoir for fluid and means for filling the same, a tubular valve in the lower end of said reservoir, spring catches on said reservoir to hold said valve in the raised position, and a nozzle attached to said valve.

5. An oil well cleaner comprising a tubular reservoir for fluid and means for filling the same, a tubular valve in the lower end of said reservoir, a projection on said tubular valve, spring catches on said reservoir to spring over said projection and hold said valve, and a nozzle on said valve having egress openings for said fluid.

6. An oil well cleaner comprising a tubular reservoir, an inner tube extending nearly to the bottom of said reservoir, means for filling said reservoir with fluid under pressure through said inner tube, and means for providing egress for said fluid from said reservoir.

7. An oil well cleaner comprising a tubular reservoir and means for filling the same, a tubular valve slidably mounted in the lower end of said reservoir having a valve seat within said reservoir, a nozzle screwed into said tubular valve, spring catches on said reservoir to engage and hold said tubular valve in a raised position.

8. An oil well cleaner comprising a tubular reservoir 10 having a closure 12 at the upper end, an inner tube 14 extending nearly to the bottom of said reservoir, a vent tube 16 in said reservoir having a valve 17 and pressure gage 18, and an egress valve 20 at the lower end of said reservoir.

9. An oil well cleaner comprising a tubular reservoir 10 having a closure 12 for its upper end, an inner tube 14 extending

down into said reservoir, a closure 19 for the lower end of said reservoir having a valve seat 21, a tubular valve 20 slidably mounted in closure 19 having a projecting rim 27 thereon, a nozzle 23 having openings 24 and a trip rod 25, and spring catches 26 on said reservoir for said nozzle, substantially as and for the purpose specified.

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

FRANCIS A. FLANEGIN.

Witnesses:
A. L. FURLOW,
I. A. ELLSWORTH.