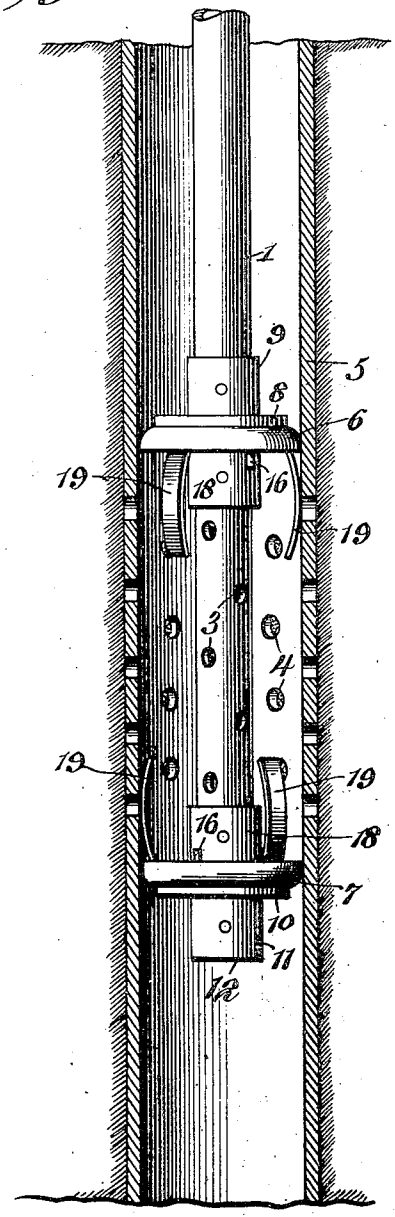
No. 848,501. PATENTED MAR. 26, 1907.

F. N. SCOFIELD.

OIL WELL CLEANER.

APPLICATION FILED NOV. 21, 1906.

Fig. 1.



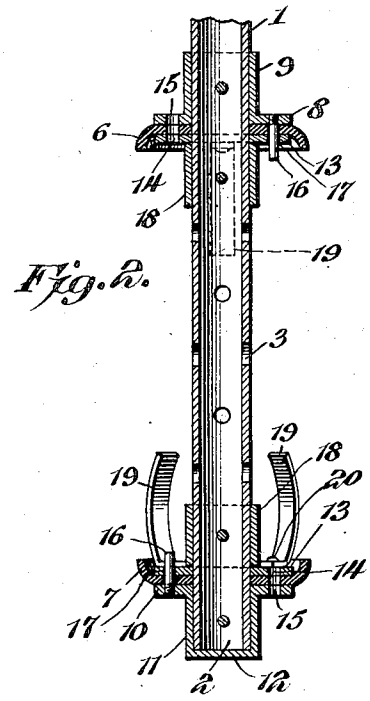


Fig. 2.

Fig. 3.

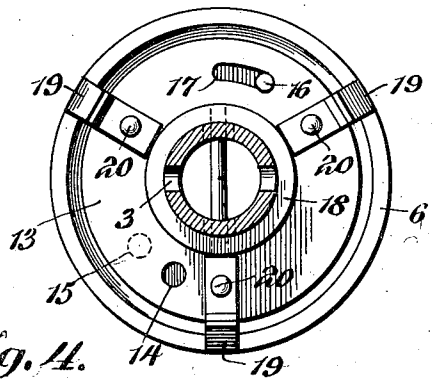
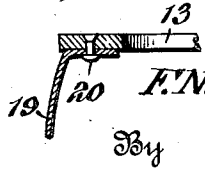


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

FRED N. SCOFIELD, OF KERN, CALIFORNIA.

OIL-WELL CLEANER.

No. 848,501. Specification of Letters Patent. Patented March 26, 1907.

Application filed November 21, 1906. Serial No. 344,475.

To all whom it may concern:

Be it known that I, FRED N. SCOFIELD, a citizen of the United States, residing at Kern, in the county of Kern and State of California, have invented a new and useful Oil-Well Cleaner, of which the following is a specification.

The invention relates to improvements in oil-well cleaners.

In oil-fields where oil is obtained from strata of oil-sand it is customary to line the wells with a casing and to perforate the casing at the points where strata of oil-sand lie or to line the well from the top to the bottom with perforated casing. These perforations often become clogged, and it has been the practice to pump oil into the well for the purpose of forcing the sand back, and thereby opening the perforations. This method has been only partially successful, as the pressure is applied only at the bottom of the well, the oil flowing out through the perforations at the bottom, making it impossible to get a pressure on the upper portions of the well. There are usually several strata of oil-sand in a well, sometimes separated by many feet of barren ground, and it is impossible by the said method to apply the pressure at any desired point in the well-casing.

The object of the present invention is to provide a well-cleaner by which oil may be pumped into a well and the pressure applied to and confined at any portion of the well-casing, so that the perforations at any one of the strata of oil-sand may be cleaned.

With these and other objects in view the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended, it being understood that various changes in the form, proportion, size, and minor details of construction within the scope of the claims may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side elevation of a well-cleaning device constructed in accordance with this invention and shown applied to a well, the well-casing being in section. Fig. 2 is a longitudinal sectional view of the well-cleaning device. Fig. 3 is an enlarged transverse sectional view illustrating the construction of the valves. Fig. 4 is an enlarged detail sectional view illustrating the manner of securing the spring to the relatively movable disks or flanges of the valves.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a tube, having its lower end 2 closed and provided at its lower portion with perforations 3 for the discharge of oil or any other fluid which is pumped into the well through the tube 1 when it is desired to clean the well. The tube 1, which forms a stem or rod, is adapted to be raised and lowered to arrange the perforations 3 at any portion of a well.

In order to confine the oil or other fluid and the pressure at any desired portion of the well-casing, the tube is provided with upper and lower valves 6 and 7, which may be cup-shaped, as shown, or any other preferred construction and which are adapted to close the well-casing at the top and bottom of the perforated portions of the tube 1. The cup-shaped portions or members of the valves are constructed of leather or any other flexible material, and when oil is pumped into the well such liquid under pressure expands the cup-shaped valves and forces the same tightly against the well-casing, so that there will be no leakage of oil or other fluid into the well above or below the portion operated on. The flexible portion of the upper valve is supported at its upper face by a laterally-extending flange 8, which is formed integral with a sleeve 9, and the latter is suitably secured to the tube 1. The flexible portion of the lower valve is supported at the lower face by a similar flange 10, which is formed integral with a sleeve 11, and the latter is in the form of a cap and has a bottom wall 12, which closes the said lower end 2 of the tube.

Each of the valves is provided with a relatively movable rotary member 13, having one or more openings 14, which are adapted to be carried into and out of register with corresponding openings 15 of the flanges 8 and 10. When the openings are in register, the liquid within the well is permitted to flow through the valves to enable the cleaner to be readily moved upward or downward in the well. The relatively movable members are arranged at the inner faces of the flexible members of the valves, and the openings 15 extend through the said flexible members. The relative movement of the rotary members is limited by projections or pins 16,

fixed to the flanges 8 and 10 and extending into short curved slots 17 of the rotary members. The attached ends of the pins or projections are preferably threaded, as shown, to engage threaded perforations of the flanges 8 and 10.

The rotary members, which are in the form of disks or similar flanges, are provided with central openings to receive the tube 1 and are retained in position with relation to the flexible cup-shaped members by means of sleeves 18 and are provided with springs 19. The sleeves are suitably secured to the tube 1 and are spaced from the sleeves 9 and 11.

The springs 19, which are adapted to flexibly engage the well-casing, are located between the valves and are secured to the movable disks or members by rivets 20 or other suitable fastening devices. When the cleaner is introduced into a well, the curved springs flexibly engage the well-casing and will hold the disks or members 13 stationary, while the tube is partially rotated for operating the valves. The rotary movement of the tube 1 will cover or uncover the openings through the valves, and when the openings are covered oil or other fluid may be pumped into the well or through the tube, and the upper and lower valves will confine the oil or other fluid to the particular perforated portion of the well-casing desired to be operated on. By this construction the pressure may be applied at any point without applying the pressure throughout the entire well. This will enable the perforated portions of the oil-wells to be more effectively cleaned than heretofore and with less oil or other fluid.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A well-cleaner comprising a tube forming a passage for a liquid and having an outlet, said tube being also provided with means for closing it below the said outlet, and spaced means mounted on the tube and engaging with the wall of the well for confining the liquid within a section or portion of the said well.

2. A well-cleaner comprising a tube forming a passage for a liquid and having an outlet and provided also with means for closing it below the outlet, and valves for confining the liquid within a portion or section of the well.

3. A well-cleaner comprising a tube forming a passage for oil or other fluid and having an outlet and provided also with means for closing it below the outlet, and valves located above and below the outlet and arranged to close the well for confining the oil or other fluid within a portion or section of the same.

4. A well-cleaner comprising a tube forming a passage for oil or other fluid and having an outlet and provided also with means for closing it below the outlet, and valves located above and below the outlet for closing a well above and below the said outlet and confining the oil or other fluid, said valves having openings and provided with means for covering and uncovering the same.

5. A well-cleaner comprising a tube forming a passage for oil or other fluid and having an outlet and provided also with means for closing it below the outlet, valves located above and below the outlet and arranged to close a well above and below the said outlet, said valves having openings and provided with movable members for covering and uncovering the said openings, and means connected with the members for frictionally engaging the walls of the well for holding the said members stationary when the tube is moved.

6. A well-cleaner comprising a tube having its lower end closed and provided with a perforated portion, and valves located above and below the perforated portion for closing a well.

7. A well-cleaner comprising a tube closed at the lower end and provided with a perforated portion, valves located at the ends of the perforated portion and arranged to close a well above and below the said perforated portion, said valves having openings and relatively movable members arranged to cover and uncover the said openings and provided with springs for engaging the walls of the wells, whereby the relatively movable members are adapted to be operated through the movement of the tube.

8. A well-cleaner comprising a tube having a perforated portion and provided with means for closing it below the same, valves located above and below the perforated portion for closing a well, said valves being provided with openings, relatively movable members arranged to cover and uncover the openings, said members having slots, and projections mounted on the valves and operating in the slots for limiting the relative movement of the members.

9. A well-cleaner comprising a tube having a perforated portion and provided with means for closing it below the same, and exterior valves carried by the tube above and below the said perforated portion, said valves being constructed to engage the wall of the well, for the purpose set forth.

10. A well-cleaning device provided with a passage for a liquid and having an outlet for the same, and spaced means located above and below the outlet and engaging the wall of the well for confining the liquid within a section or portion of the well.

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

FRED N. SCOFIELD.

Witnesses:
FRED E. BORTON,
E. M. SCOTT.