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PATENTED JAN. 27, 1903.

R. J. HOFFMAN.  
OIL WELL CLEANER.

APPLICATION FILED OCT. 25, 1902.

NO MODEL.

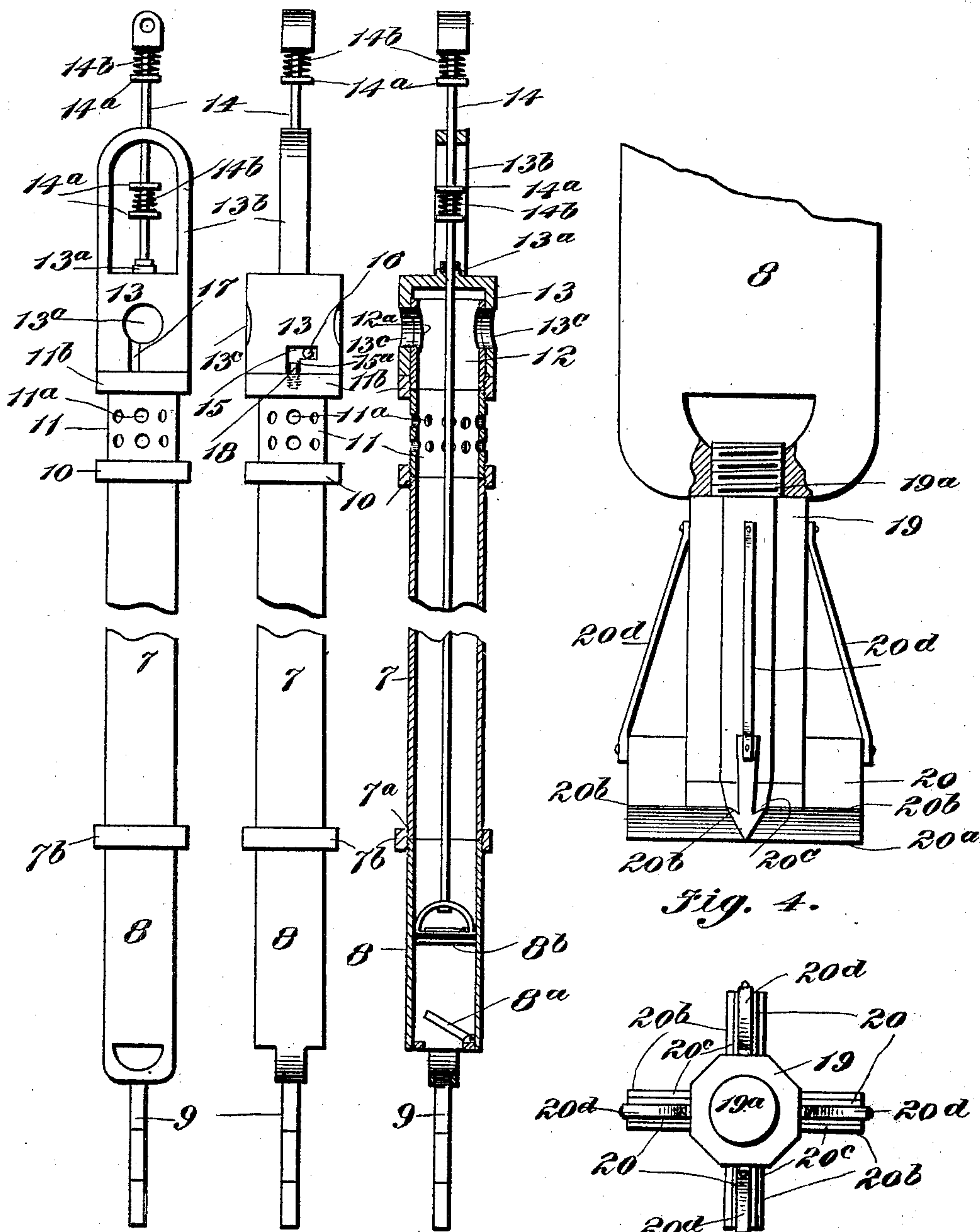


Fig. 1. Fig. 2. Fig. 3.

Fig. 4. Fig. 5.

Witnesses  
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# UNITED STATES PATENT OFFICE.

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## OIL-WELL CLEANER.

SPECIFICATION forming part of Letters Patent No. 719,004, dated January 27, 1903.

Application filed October 25, 1902. Serial No. 128,738. (No model.)

*To all whom it may concern:*

Be it known that I, ROY J. HOFFMAN, a citizen of the United States, residing at Reno, in the county of Washington and State of Ohio, have invented certain new and useful Improvements in Oil-Well Cleaners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in apparatus for cleaning oil-wells, and particularly for removing paraffin and similar deposits from the walls of the same. These deposits result in a filling up of the crevices of the oil-producing strata, and unless removed will materially decrease the production of the well.

The object of my invention is to provide a simple and efficient apparatus to remove such deposits.

My invention comprises, substantially, a sand pump or bailer of such construction as to permit of it being used also to spray benzene or other cleaning fluids against the walls of the well for removing the paraffin deposits from the same.

A further object is to provide means for cutting up or disintegrating sand and other sediment to facilitate its removal from the well.

In the accompanying drawings, Figure 1 is a side elevation of my apparatus. Fig. 2 is a like view taken at right angles to Fig. 1. Fig. 3 is a central vertical section. Fig. 4 is a side elevation of the sand-cutting device secured to my apparatus. Fig. 5 is a top plan of the cutting device.

Referring specifically to the drawings, 7 indicates a tube the lower end of which is threaded, as at 7<sup>a</sup>, to receive a collar 7<sup>b</sup>, into which is screwed the working barrel 8 of a pump, of which the standing valve is indicated at 8<sup>a</sup> and the working valve at 8<sup>b</sup>. Subs 9 are secured to the bottom of the working barrel in the usual manner. By increasing or decreasing their number the location of the pump within the well may be changed—that

is, it may be raised or lowered in order that all portions of the well may be operated on. The working barrel is made removable in order that the contents of the tube when filled may be readily let out. These parts are all well known and of the usual or improved construction, and a further description of the same is thought to be unnecessary.

To the upper end of the tube 7 is secured a collar 10, and screwed into this collar is a short section of tubing 11, which is provided with perforations 11<sup>a</sup> for a purpose to be hereinafter described. On the upper end of the tube 11 another collar 11<sup>b</sup> is screwed, and to this collar a short section of tubing 12 is screwed, which is provided with two diametrically opposite overflow-openings 12<sup>a</sup>. A cap 13 fits over the tube 12 and rests on the collar 11<sup>b</sup>. It has a stuffing-box 13<sup>a</sup> and a bail 13<sup>b</sup>, through which the valve-stem 14 passes. The cap also has openings 13<sup>c</sup> to register with the openings 12<sup>a</sup>. By giving the cap a quarter-turn these openings may be closed, as will be hereinafter explained. The valve-stem has collars 14<sup>a</sup> and coil-springs 14<sup>b</sup> above and below the bail, by means of which the strokes of the valve-stem are cushioned. To close the overflow-openings, the following means are employed: At diametrically opposite points on the cap 13 I provide bayonet-slots 15, through which pins 16 extend, said pins being secured to the tube 12. These pins prevent separation of the tube and cap, and they are of sufficient strength to sustain the weight of the apparatus. A vertical slot 17 also extends from the openings 13<sup>c</sup> to the base of the cap. To the collar 11<sup>b</sup> are secured spring-latches 18 at diametrically opposite points. These parts are so arranged that when the overflow is opened the latches engage the vertical portion 15<sup>a</sup> of the bayonet-slots, by which the cap is locked against turning on the tube 12. To close the overflow, I grasp the tube 11 with a suitable tool and withdraw the latches from the vertical portion of the bayonet-slots. The cap is then given a little turn to bring the pins 16 in line with the vertical portion of the bayonet-slots. The cap is then raised until the pins are out of the slots. It is then given a quarter-turn, the imperforate portion closing the overflow and the pins occupying a position just below



the slots 17. The cap is now pushed down against the collar 11<sup>b</sup>, the slots 17 passing the pins and the latches engaging the slots, which locks the cap against turning. The overflow  
5 is opened in substantially the same manner as it is closed.

In Figs. 4 and 5 I have shown an arrangement to be secured to the pump for the purpose of cutting or breaking up sand, rock, or  
10 other accumulations which are to be removed from the well. It comprises a shank 19, having a reduced portion 19<sup>a</sup> at one end, which is threaded to screw into the bottom of the pump, as shown in Fig. 4. At the bottom of  
15 the shank knives 20 are secured, there being four arranged at right angles to each other, as shown, and provided with a cutting edge 20<sup>a</sup> at the bottom. These knives are arrow-shaped, the barbs 20<sup>b</sup> forming a ledge 20<sup>c</sup>, on  
20 which the sand and other material rests when the knives are forced into the same and by which it is lifted up and caused to be thoroughly mixed with the oil. This facilitates its removal by the pump. The barbs also loosen  
25 the material when the knives are raised. Braces 20<sup>d</sup> are provided, securing the knives and also protecting them from catching in any obstruction. In using this cutting device  
30 the pump is successively raised and dropped, the weight of the same forcing the knives into the material, cutting and loosening the same, as above described.

The operation of my apparatus is as follows: I pour the benzene or other cleaning fluid into  
35 the well from the surface and lower the pump, the overflow-openings being closed. The valve-stem is then reciprocated, and at each upward stroke the cleaning fluid enters at the bottom and is sprayed out through the perforations 11<sup>a</sup>. After one part of the well has  
40 been cleaned I remove one or more subs and repeat the spraying operation. By removing more subs and continuing the spraying I am able to clean all parts of the well. After all  
45 the subs are removed and the pump reaches the bottom of the well I am ready to remove the sand, which is done as follows: I open the overflow-openings 12<sup>a</sup> and attach the cutting  
50 dropping the pump, as heretofore described,

I thoroughly disintegrate the sand and other sediment, and when the pump is filled with the same I raise it and remove its contents by removing the pump-barrel. The pump is  
55 then again lowered into the well and more sand removed until the well is thoroughly cleaned. The overflow being open the sand, &c., will discharge through it if the pump should fill before it can be removed from the well.  
60

Having thus described my invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A well-cleaning device comprising a tube having spraying and overflow openings near  
65 the top thereof, a working pump at the bottom of the tube discharging thereinto, and means to open and close the overflow-openings, substantially as described.

2. The combination with a tube having a  
70 suction-pump at the bottom thereof, and spraying-holes and overflow-openings near the top, of a cap having means for opening and closing the overflow-openings, substantially as described.  
75

3. A well-cleaning device comprising a tube having a suction-pump at the bottom and spraying and overflow openings near the top, and a perforated cap over the end of the tube  
80 adapted to be turned to open and close the overflow-openings, substantially as described.

4. The combination with a tube having a suction-pump at the bottom thereof and spraying and overflow openings near its top,  
85 of a cap over the end of the tube having openings to register with the overflow-openings, and adapted to be turned to close the overflow-openings, substantially as described.

5. The combination with a pump, of a shank attached to the bottom thereof, and  
90 downwardly-presented knives secured to the shank having ledges formed thereon for lifting the material, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROY J. HOFFMAN.

Witnesses:

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