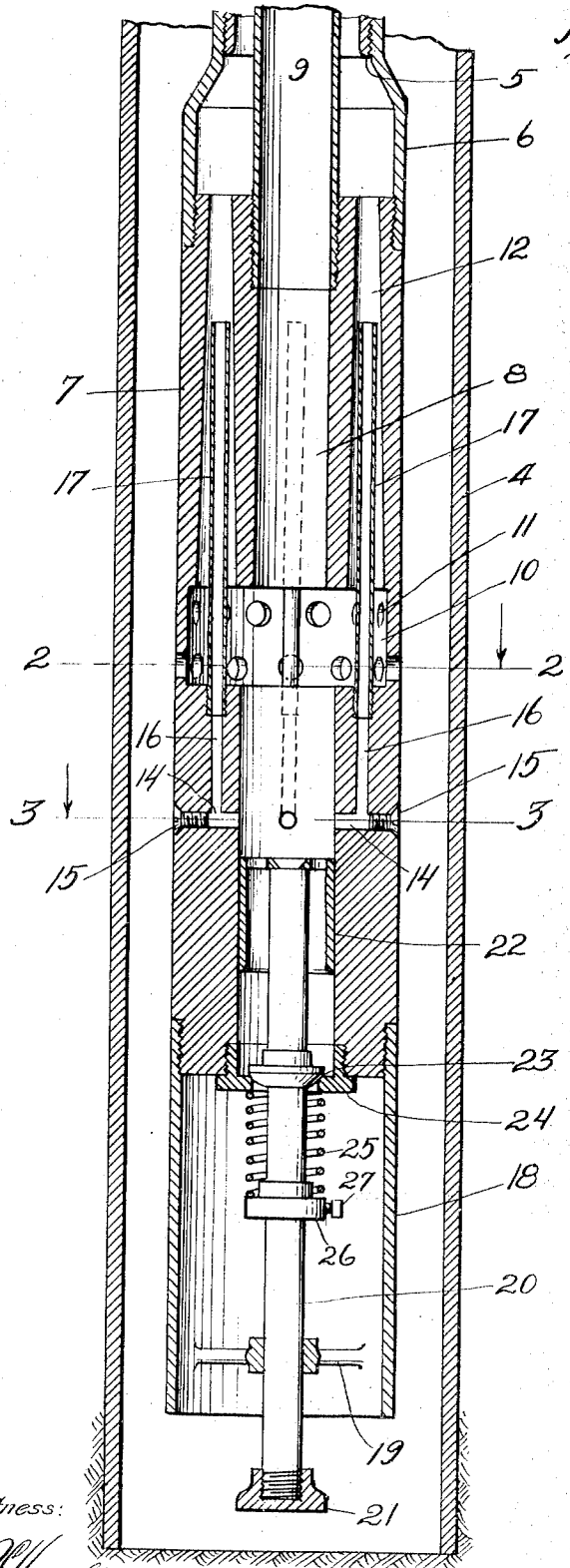
F. J. STUMPF.

OIL WELL CLEANER.

APPLICATION FILED MAR. 13, 1920.

1,360,053. **Patented Nov. 23, 1920.**

Fig. 1



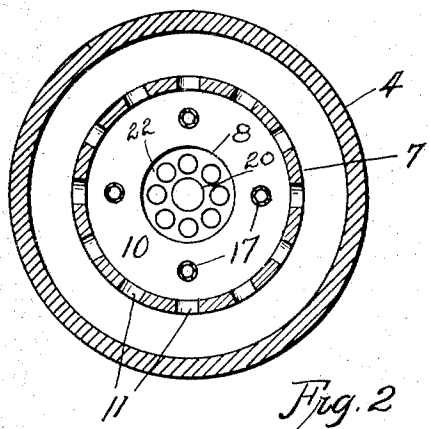


Fig. 2

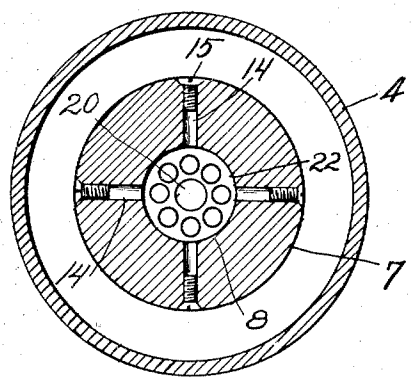


Fig. 3

Witness:

R. Hamilton

Inventor,

Frank J. Stumpf,

By Thorpe & Thorpe

his attorneys

UNITED STATES PATENT OFFICE.

FRANK J. STUMPF, OF MOUNT WASHINGTON, MISSOURI.

OIL-WELL CLEANER.

1,360,053. Specification of Letters Patent. Patented Nov. 23, 1920.

Application filed March 13, 1920. Serial No. 365,469.

To all whom it may concern:

Be it known that I, FRANK J. STUMPF, a citizen of the United States, and resident of Mount Washington, county of Jackson, State of Missouri, have invented a certain new and useful Improvement in Oil-Well Cleaners, of which the following is a complete specification.

The present invention relates to well pumping and cleaning apparatus, and one of the objects of the invention is to provide an improved construction for the lower end of the pump tubing adapted for efficient use both in the pumping operation of the well and also for utilizing a flow of steam or the like in the cleaning of the lower end of the pump tubing and the bottom of the well. Accordingly I have devised an improved device adapted to be associated with the lower end of the pump tubing for the purpose of receiving a flow of fluid, such as air, and directing the flow of this fluid in carrying out the pumping operation, and likewise to receive a flow of steam and so discharging the steam as to efficiently clean both the lower portion of the pump tubing and the passages thereto and also the space around the lower end of the pump structure at the bottom of the well.

A further feature of the invention is the provision of a valve structure forming a part of the improved device and operating by engagement with the bottom of the well for controlling the flow of the fluid according as it is being used for cleaning the pump passages or the well space about the lower end of the pump structure.

With these general objects in view, the invention will now be described by reference to the accompanying drawing illustrating one form of construction which I have devised for embodying the improvement, after which the novel features therein will be particularly set forth and claimed.

In the drawing—

Figure 1 is a vertical sectional view of the lower portion of a well casing having positioned therein an attachment for the lower end of the pump tubing embodying the present invention; and

Figs. 2 and 3 are transverse sections taken on the lines 2—2 and 3—3 respectively, of Fig. 1.

Referring now to the drawing in detail, this shows a well casing 4 forming the inner of a well, such as is commonly used in oil wells for which the proposed improved construction is particularly designed. Extending down into proximity with the bottom of the well is a pump tubing 5, to the lower end of which is attached, as by means of a coupling 6, a special casting so constructed and formed with passages as to serve as a fluid discharging and distributing device 7, the same having a central bore or passage 8 to the upper end of which is connected a fluid conduit member 9 leading from the top of the pump structure and adapted to conduct therefrom a flow of either air under pressure or steam for use in either the pumping operation or in the pump and well cleaning operation, respectively.

Near the central portion of the member 7, the bore 8 is enlarged to form a chamber 10, the exterior wall of which is formed with a plurality of jet orifices 11 communicating with the space around the member 7 and inside the well casing 4. Surrounding the upper portion of the central passage or bore 8 is formed a plurality of upwardly tapered passages 12 communicating at their upper ends with the space inside the coupling 6, and hence with the lower end of the pump tubing 5. Below the chamber 10, the casting 7 is drilled to form a series of radial passages 14 (see particularly Fig. 3), the outer ends of which are closed by means of screws 15, and their inner ends communicating with the central passage 8. Communicating with the passages 14 are the several vertical passages 16 leading in the direction of the chamber 10, and fitted into the upper ends of these passages 16 are the several jet tubes 17 which project up through the chamber 10 and partly through the passages 12 into proximity with the upper or nozzle ends of said passages.

Fitted to the lower end of the casting 7 is a casing section 18 extending some distance below said casting 7 toward the bottom of the well, the interior of which casing is provided with a spider bearing 19 for a valve stem or rod having a foot piece 21 adapted, on sufficient lowering of the pump structure, to engage the bottom of the well for actuating the valves carried thereby. The upper end of this valve stem or rod 20 is provided with a sleeve valve 22 adapted, on sufficient upward movement of the rod 20, to close the intake passages 14 to the jet tubes 17. Below the valve 22, the rod 20 carries a second valve 23 designed to

normally engage a valve seat 24 fitted into the lower end of the bore or passage 8. The valve 23 is held normally in closed position, and the valve 22 in normally open position by the action of a coil spring 25 interposed between the valve seat 24 and a suitable collar 26 secured by a clamping screw 27 to the valve rod or stem 20.

In the use of the above described structure for the pumping operation a flow of a suitable fluid, such as air under pressure, is introduced into the conduit 9, and the described arrangement of passages within the casting 7 causes the flow of the fluid pressure to carry the liquid contents of the bottom of the well along with said flow up through the passages 12 into the bottom of the pump tubing and then to the top of the well at the point provided for the pump's discharge. In this operation, it will of course be understood that the upper end of the space between the pump tubing and the well casing is maintained air tight, and also that the valve 22 is in open position and the valve 23 in closed position as shown in Fig. 1. In the operation of the improved construction for cleaning purposes, the tubing is lowered sufficiently to bring the foot piece 21 into engagement with the bottom of the well, whereupon the rod 20 will, on slightly further lowering of the pump tubing, be maintained stationary so that the valve 22 is brought into closed position and the valve 23 opened; this permits a flow of steam supplied through the conduit 9 to be discharged through the outlet at the lower end of the passage 8 into the bottom of the well, while at the same time steam jets are discharged through the orifices 11 into the space between the member 7 and the casing 4, all for the purpose of loosening up and cleaning out such deposits as collect in the bottom of the well and also around the member 7 and lower end of the pump tubing. In this operation, the jet tubes 17 of course remain functionless, due to the intake of each tube being retained closed by the valve 22 projecting across the passages 14.

It will thus be apparent that I have devised a simple and efficient arrangement and construction for carrying out the proposed objects of the invention, and while I have described what I now deem to be the preferred form of construction, I desire to reserve the right to make such formal changes as may fairly fall within the scope of the following claims.

What I claim is:

1. Well pumping and cleaning apparatus comprising, in combination with the pump tubing, a fluid conduit projecting down through said tubing, a fluid discharging device associated with the lower end of said conduit and provided with nozzle passages adapted to discharge upwardly into the lower end of said tubing, jet tubes of smaller diameter than said passages and positioned axially therein and terminating short of the upper ends thereof, said device being provided with jet orifices adapted to discharge in a direction laterally outward from said device, and valve means for closing the intake ends of said tubes during the cleaning operation.

2. A well pumping and cleaning apparatus comprising, in combination with the pump tubing, a fluid conduit projecting down through said tubing, and a fluid discharging device associated with the lower end of said conduit and provided with jet orifices adapted to discharge in a direction laterally outward from said device and also with jet tubes extending in position to discharge into the lower end of said pump tubing, and valve means for closing the intake ends of said tubes during the cleaning operation.

3. Well pumping and cleaning apparatus comprising, in combination with the pump tubing, a fluid conduit projecting down through said tubing, and a fluid discharging device associated with the lower end of said conduit and provided with jet tubes adapted to discharge fluid from said conduit upwardly into the lower end of said pump tubing, said device having a discharge passage having an outlet to the bottom of the well and a valve structure adapted to simultaneously open the outlet end of said discharge passage and close the passages leading to said jet tubes.

4. Well pumping and cleaning apparatus comprising, in combination with the pump tubing, a fluid conduit projecting down through said tubing, and a fluid discharging device associated with the lower end of said conduit and provided with jet tubes adapted to discharge fluid from said conduit upwardly into the lower end of said pump tubing, said device having a discharge passage having an outlet to the bottom of the well and a valve structure normally closing the outlet end of said discharge passage and opening the passages leading to said jet tubes, said valve structure having a rod projecting in position for engagement with the bottom of the well for simultaneously opening the outlet end of said discharge passage and closing the passages leading to said jet tubes.

In witness whereof I hereto affix my signature.

FRANK J. STUMPF.