R. R. TEMPLE.

PUMPING APPARATUS.

APPLICATION FILED APR. 30, 1917.

1,297,930.

Patented Mar. 18, 1919.

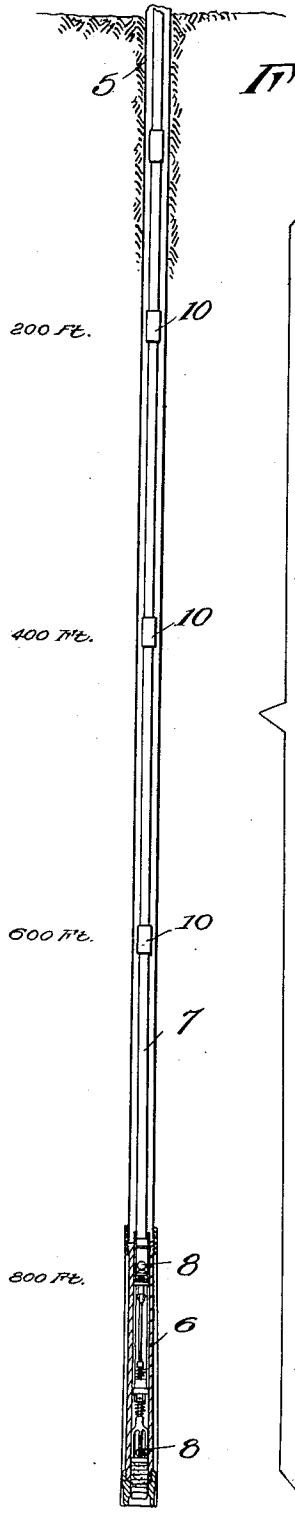
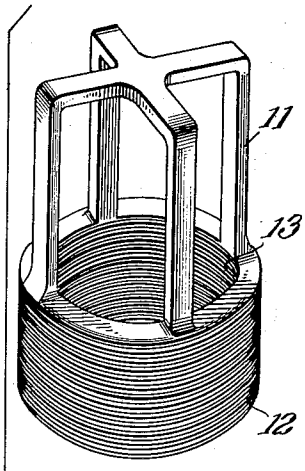
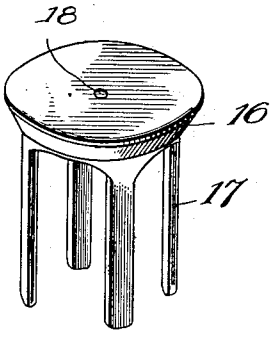


Fig. 1.





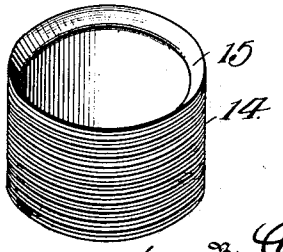
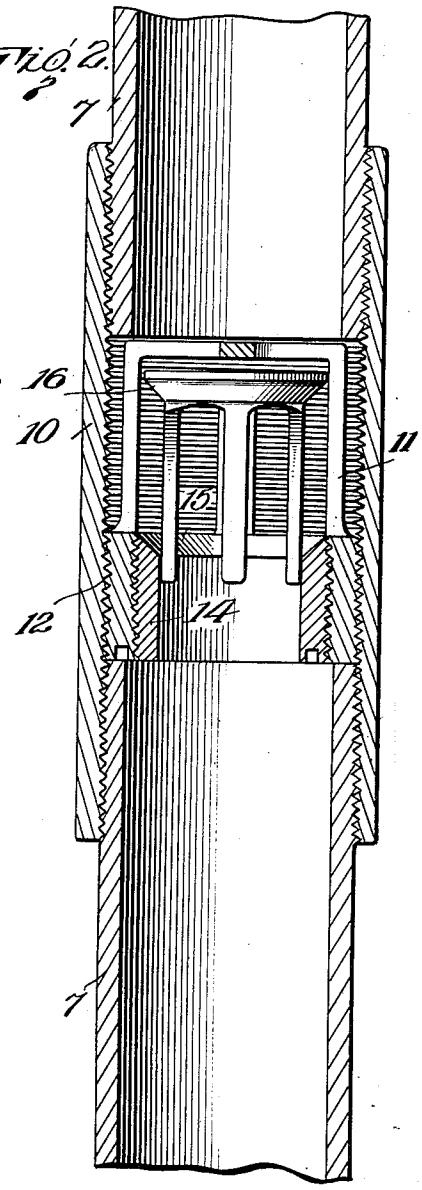


Fig. 3.

Fig. 2.



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PUMPING APPARATUS.

1,297,930. Specification of Letters Patent. Patented Mar. 18, 1919.

Application filed April 30, 1917. Serial No. 165,368.

To all whom it may concern:

Be it known that I, RUSSELL R. TEMPLE, a citizen of the United States, residing at Santa Paula, in the county of Ventura and State of California, have invented certain new and useful Improvements in Pumping Apparatus, of which the following is a specification.

This invention relates to pumping apparatus, and more particularly to improvements in apparatus designed for pumping oil or the like from a great depth below the surface of the ground.

The invention will hereinafter be described with relation to its application to the hollow sucker rod used in connection with oil pumping apparatus, in which the hollow sucker rod is reciprocated within a hollow shaft or tubing within the ground.

One of the objects of the present invention is to provide an improved pumping apparatus adapted to be used for the purpose above set forth, which will render the apparatus more efficient and reliable in use and operation. A further object is to provide an apparatus of the above character with means adapted to relieve the pump of the entire weight of the column of liquid which it is raising to the surface of the ground.

Other objects will be in part obvious from the annexed drawing and in part indicated in connection therewith by the following analysis of this invention.

This invention accordingly consists in the features of construction, combination of parts and in the unique relations of the members and in the relative proportioning and disposition thereof, all as more completely outlined herein.

To enable others skilled in the art so fully to comprehend the underlying features thereof that they may embody the same by the numerous modifications in structure and relation contemplated by this invention, a drawing depicting a preferred form has been annexed as a part of this disclosure, and in such drawing like characters of reference denote corresponding parts throughout all the views, in which

Figure 1 is a sectional elevational semi-diagrammatic view of the complete apparatus;

Fig. 2 is a vertical sectional view of the coupling and check valve of the hollow sucker rod;

Fig. 3 is a perspective view of certain detached parts of the check valve.

Referring now to the drawings in detail, and more particularly to Fig. 1, 5 denotes the outer casing or tubing which is lowered into a drilled hole in the ground to the full depth of the well. At the lower end of this tubing is a pump 6 of any desired hollow piston rod type. This pump is connected with a hollow sucker rod 7, which is reciprocated within the casing 5 in any well known manner. The pump itself is provided with one or more check valves 8, as indicated, of such construction that as the pump moves downwardly the oil or liquid to be pumped will pass up through the opening, and on the up-stroke will be prevented from passing back through the openings by the ball valves, as indicated. This constant reciprocation of the pump will cause the oil to pass up through the sucker rod and flow out through the top.

As above stated, it is one of the objects of the present invention to provide an apparatus of this general character with means adapted to relieve the pump from supporting the complete column of oil extending to the surface, and with this idea in mind a plurality of check valves are provided in the sucker rod at regular intervals, say one or two hundred feet apart, adapted to support a section of the column of oil thereabove. This check valve is shown in Fig. 2 of the drawings, and is preferably interposed between two adjacent sections of the sucker rod 7. These sections are threaded at their ends and coupled together by means of a coupling member 10 as shown. This coupling member, which is threaded throughout its length, has centrally disposed therein a cage, 11, the lower part of which is threaded at 12 to co-act with the threads of the coupling member, and is also internally threaded at 13 to receive the valve seat member 14, the latter being provided with a bevel valve seat 15, with which a correspondingly shaped valve member 16 is designed to co-act. A ball valve may be used if desired. The valve 16 is provided with a plurality of downwardly projecting legs 17, adapted to fit within the valve seat member 14 and be guided thereby in its up and down movement within the cage 11. Each valve 16 is preferably provided with a small leak hole 18 in the top to better

insure its setting into place and give it a freer action. These valve members are all substantially of the same construction, size and material, according to requirements, and it is believed that the method of use and operation of a device of this character is clear from the above description. It may be stated however that after the parts are assembled in the usual manner, and occupy the position substantially as shown in Fig. 1, the hollow sucker rod is reciprocated, which causes the oil or other liquid to pass upwardly through the pump and within the sucker rod 7. The valve 16 operates simultaneously with the operation of the valves on reciprocation of the sucker rod, and each one is designed to support the column of liquid immediately thereabove and below the next above check valve. The parts are of simple and practical construction, and they may be easily applied to systems now in general use without material modification or alteration.

It will be noted that when it is desired to remove the member 14, as for instance when grinding the valve seat 15, the lower section of the hollow sucker rod or pipe 7 may be removed and the member 14 unscrewed without disturbing the cage.

I realize that considerable variation is possible in the details of construction and arrangement of parts without departing from the spirit of my invention, and I therefore do not intend to limit myself to the specific form shown and described.

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

1. The combination of a pair of pipe sections having threaded ends, a threaded coupling arranged to engage the threaded ends of the pipe sections for connecting them together, a cage having a threaded portion arranged to engage the threads of the couplings on the interior thereof, a valve seat threaded externally and arranged to engage internal threads on the cage for holding the valve seat in position, and a valve disposed within the cage and arranged to engage the valve seat.

2. The combination of a pair of pipe sections having threaded ends, a threaded coupling arranged to engage the threaded ends of the pipe sections for connecting them together, a cage comprising an upper open frame and a lower integral hollow cylindrical portion threaded externally for engaging the threads of the coupling, a hollow cylindrical member disposed on the interior of said lower portion and having a valve seat at its upper end, and a valve disposed within the cage and having guide members arranged to engage the interior of the cylindrical member carrying the valve seat.

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

RUSSELL R. TEMPLE.

Witnesses:
RALPH S. BROWN,
M. R. WILLIAMS.