J. NORBYE.

OIL WELL APPARATUS.

APPLICATION FILED JUNE 24, 1919.

1,389,007.

Patented Aug. 30, 1921.

Fig. 1

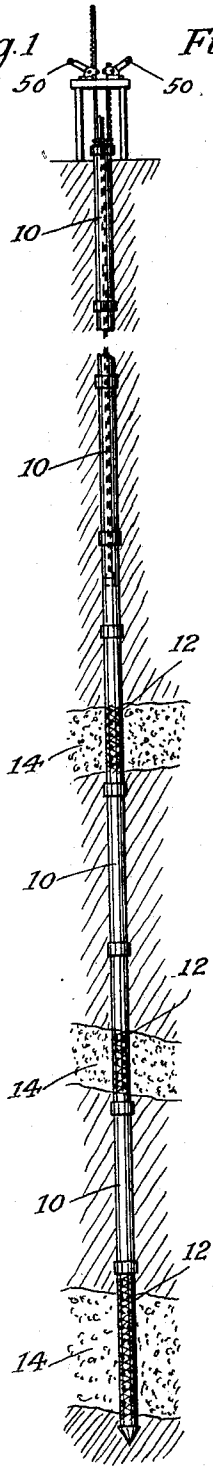


Fig. 2

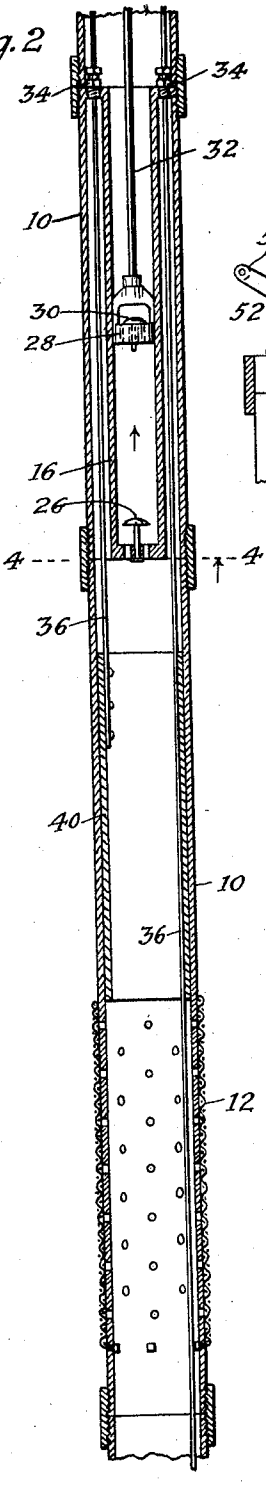


Fig. 3

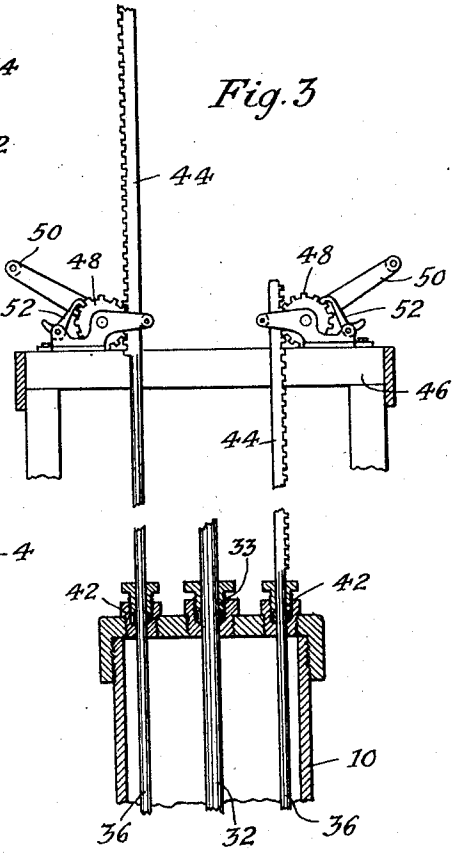
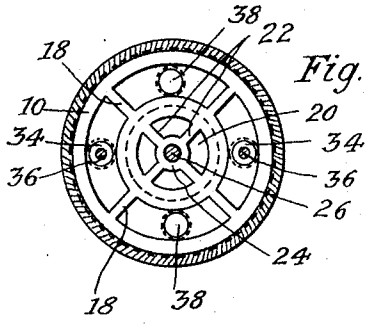


Fig. 4



Inventor:
Julius Norbye.
By Whiteley and Ruckman
his Attorneys.

UNITED STATES PATENT OFFICE.

JULIUS NORBYE, OF MINNEAPOLIS, MINNESOTA.

OIL-WELL APPARATUS.

1,389,007. Specification of Letters Patent. Patented Aug. 30, 1921.

Application filed June 24, 1919. Serial No. 306,507.

To all whom it may concern:

Be it known that I, JULIUS NORBYE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Oil-Well Apparatus, of which the following is a specification.

My invention relates to oil-well apparatus and an object is to provide means for closing at will the passageways extending through the well-casing at one or more sand levels in case no oil is being obtained at these levels. When the passageways at the levels from which the oil is exhausted have been closed, the pumping of oil from the other levels may continue in an efficient manner since the entrance of air into the well-casing at the levels from which no oil is being obtained is prevented.

The full objects and advantages of my invention will appear in connection with the detailed description thereof and the novel features embodied in my inventive idea will be particularly pointed out in the claims.

In the accompanying drawings, which illustrate the application of my invention in one form,—

Figure 1 is a sectional view of a well with my apparatus shown in elevation. Fig. 2 is a vertical sectional view of a portion of a well-casing on a larger scale. Fig. 3 is a sectional elevational view of the top portion of my apparatus on a still larger scale. Fig. 4 is a view in cross-section on the line 4—4 of Fig. 2 drawn to an enlarged scale.

Referring to the drawings, 10 designates imperforate sections of a well-casing, the latter having perforated sections 12 which connect the sections 10. The perforated sections 12 are placed at desired positions to correspond with different sand levels designated at 14. A pump cylinder 16 is mounted within the pump-casing and held spaced therefrom by spider arms 18. The bottom of the cylinder is provided with an opening 20 provided with arms 22 which near the center are joined together by a ring 24 which serves as a guide for the valve stem of a valve 26. Working in the cylinder is a plunger 28 having a valve 30 and provided with a pump rod 32 passing through a stuffing-box 33 at the top of the casing and reciprocated in any well-known manner. The top of the cylinder 16 is secured to the well-casing 10 by an air-tight joint which is provided with stuffing boxes 34 through which extend rods 36. The said joint may be provided with any desired number of holes as indicated at 38 to receive rods 36, and if some of these holes are not in use to accommodate a rod they may be closed by means of plugs. The rods 36 extend down between the cylinder 16 and the casing 10, and secured to their lower ends are slides 40 which may be positioned at different distances from the top of the well corresponding to the depth of the sand levels. These slides fit in air-tight manner within the casing and are of sufficient length to cover the adjacent perforated section 12 when slid thereover. The upper portions of the rods 36 extend through stuffing-boxes 42 in the top of the casing and to the upper ends of the rods are attached racks 44. Journaled on the pump-head 46 are pinions 48 which mesh with the racks. Secured to the shafts of the pinions are crank handles 50 upon the turning of which the rods 36 and the slides 40 may be moved up or down. Dogs 52 engage the teeth of the pinions to prevent rotation except when the dogs are released.

The operation and advantages of my invention will be obvious from the foregoing description. An efficient manner in which my apparatus may be installed and employed is as follows. In putting down a test well the distance of the different sand levels below the surface and the thickness of these levels is noted. A well may then be put down close to the test well. In assembling the well-casing it is made up of imperforate and perforated sections so arranged that when the well-casing reaches its final position the perforated sections 12 will be located at the sand levels 14 and of substantially the same height as the thickness of these levels, while the imperforate sections will extend from the top of one level to the bottom of the next level. The slides 40 are placed in the casing adjacent the perforated sections and each particular slide is made a little longer than the perforated section with which it is intended to coöperate, so that it may be made to cover the same in an air-tight manner. An air-tight fit may be insured by the use of packing rings if desired. When a well is constructed in this manner one or more levels may be shut off at any time and the pumping continued from the other levels.

I claim:

1. An oil well apparatus comprising a well-casing made up of imperforate and perforated sections, said perforated sections be-

ing located at different sand-levels and each having a length substantially the same as the thickness of the adjacent level, movable members adjacent said perforated sections for covering and uncovering the perforations therein, and means mounted at the top of the well for independently operating said movable members.

2. An oil well apparatus comprising a well-casing made up of imperforate and perforated sections, said perforated sections being located at different sand-levels and each having a length substantially the same as the thickness of the adjacent level, movable means adjacent said perforated sections for covering and uncovering the perforations therein, a pump cylinder mounted in said casing in spaced relation thereto, separate operating means for each of said movable members mounted at the top of the well, and connections between said operating means and the corresponding movable members, said connections passing between said casing and said cylinder.

3. An oil well apparatus comprising a well casing made up of imperforate and perforated sections, said perforated sections being located at different sand levels and each having a length substantially the same as the thickness of the adjacent level, slides within said well casing and adjacent said perforated sections, rods attached to said slides, and means mounted at the top of the well for independently operating said rods whereby said slides may be separately moved in order to cover or uncover said perforated sections.

In testimony whereof I hereunto affix my signature.

JULIUS NORBYE.