May 16, 1933. P. H. MACK 1,909,589

FLOODING CONTROL VALVE

Filed Jan. 8, 1929

Fig. 1.

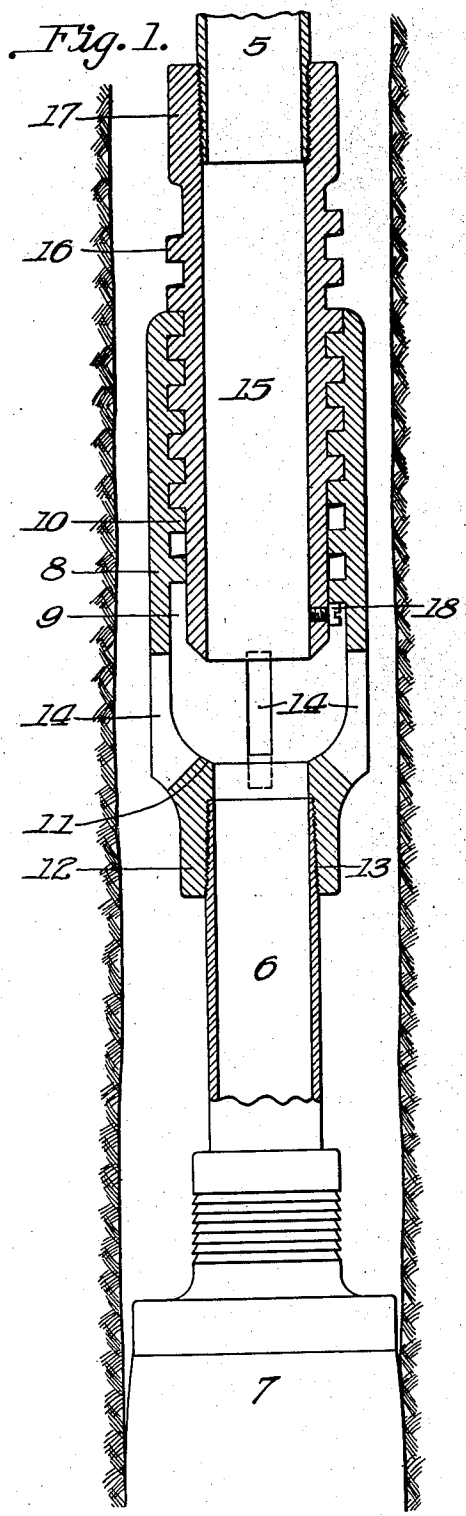
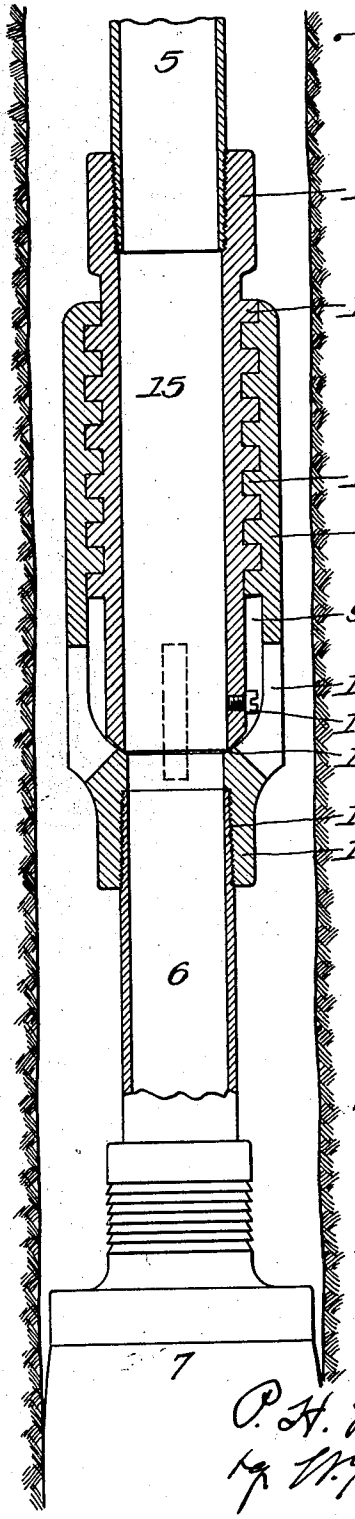


Fig. 2.



INVENTOR

P. H. Mack

by W. G. Dooliak

Attorney.

Patented May 16, 1933 1,909,589

UNITED STATES PATENT OFFICE

PATRICK H. MACK, OF BRADFORD, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO OIL WELL SUPPLY COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF NEW JERSEY

FLOODING CONTROL VALVE

Application filed January 8, 1929. Serial No. 331,099.

My invention relates to a new and improved flooding control valve, particularly designed for use in a string of tubing and employed in connection with a well packer.

In some oil fields, it is the practice to drill on a particular location, in addition to an oil well, one or more water wells, in order to supply water to the oil producing sand or strata for the purpose of driving the oil from the sand into the oil well. This driving fluid or water, in some instances, is surface water and/or water from water stratus located higher than the oil bearing sand; and, in some cases, water under pressure from the ground level is introduced to the oil sands through the tubing string. In either case, it is essential to employ a packer to maintain pressure on the oil bearing sands. This packer is carried by the tubing, said packer being of the usual or any preferred type that may be set at the desired level in the well.

The prime object of the present invention is to provide a simple, strong and efficient flooding control valve for use in the tubing and designed to be operated by the string of tubing.

Further objects of the present invention are, to provide a valve construction of such character that the valve may be opened and closed while the packer is set and without removing the weight of the tubing from the packer during the manipulation of the valve; a valve of the character mentioned having means for connecting it to sections of a tubing string and to a well packer; and a valve embodying simple and efficient coacting means for transmitting the weight of the tubing string to the packer while the packer is set and during the operation of moving the valve from closed to open position or from open position to closed position.

In the accompanying drawing which illustrates an application of my invention:

Fig. 1 is a longitudinal vertical sectional view of a valve constructed in accordance with my invention showing the valve applied to sections of tubing and to a portion of a well packer, said view showing the valve in open position; and,

Fig. 2, a similar view showing the valve in closed position.

Referring to the drawing, 5 and 6 respectively designate sections of a string of tubing, and 7 a well packer of the usual or any preferred type secured to the section 6 of the well tubing.

The valve embodying my invention is illustrated and as preferred comprises a hollow body 8 formed with a central longitudinally extending bore 9 having its interior wall threaded, as shown at 10. The lower portion of the hollow body member is reduced to form a valve seat 11 of any desired configuration suitable to cooperate with a sleeve valve operatively disposed within the body.

12 designates a coupling member formed on the lower end of the body, said member being provided with threads 13 to engage the said section 6. 14 designates a series of ports formed near the lower end of the body and adjacent the seat 11 thereof. These ports are designed to admit water or other fluid into the lower portion of the body, and from thence downwardly through the tubing string and the hollow packer to the oil bearing sand of a well.

As illustrated these ports are controlled by a sleeve valve member 15 having exterior left-handed threads 16 formed thereon designed to cooperate with the interiorly threaded portion 10 of the body. This member 15 is formed at its upper end with an interiorly threaded coupling member or collar 17, the latter being adapted to receive and be secured to the section 5 of the string of tubing. 18 designates a stop member carried by the sleeve 15, said stop member 18 functioning to prevent the entire withdrawal of the valve sleeve 15 from the body.

In practice, the flooding control valve structure, as well as the packer structure, is lowered into the well by means of the string of tubing and the packer set in the usual manner at the desired level. It will be noted that the weight of the string of tubing, after the packer is set, is always transmitted to the packer, and that this will permit a manipulation of the valve to open and closed positions for the admission of

fluid through the ports of the valve body and for preventing its admission without in any manner affecting the packer.

It will also be noted that the construction provides simple and efficient means for introducing water from levels above the packer and the oil bearing sand, to the said oil bearing sand down through the valve and packer structures; and, further, that my valve is of such a construction that water under pressure may be passed downwardly therethrough from the ground level when desired.

Due to the left-hand threads 16 on the sleeve valve member, a right turn imparted to the tubing will cause sleeve 15 to be raised relatively to the body 8 and thus permit an opening of the valve. By turning tubing to the left, the valve member 15 is lowered into the body and the valve closed.

What I claim is:

The combination with a string of tubing and a packer structure, of a valve device carried by and interposed between two sections of the tubing and positioned above the packer, said valve device including a hollow body member and a valve member for controlling a port in said body member by opening and closing movements longitudinally of the string of tubing, said valve member and body member having positive coacting means for transmitting a load from the string of tubing to the packer and effecting a movement of the valve member relative to the body member upon movement thereof to open and closed position.

In testimony whereof I affix my signature.

PATRICK H. MACK.