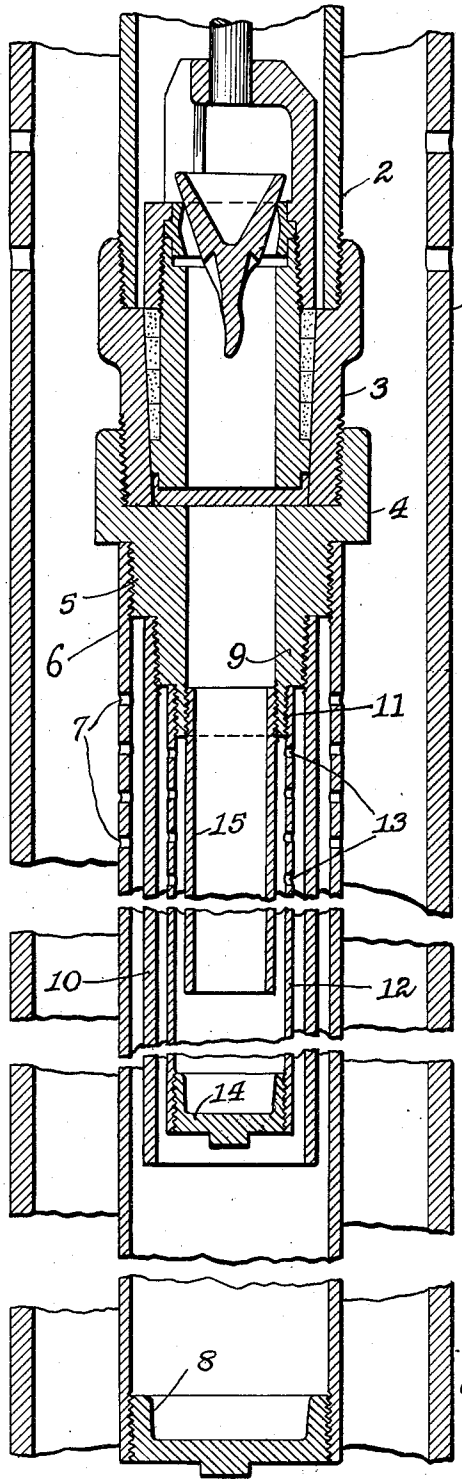
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DE WITT C. KING

TRAP FOR OIL WELL PUMPS

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INVENTOR.
DeWitt C. King
By C. Dorpham
ATTORNEY.

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DE WITT C. KING, OF FILLMORE, CALIFORNIA.

TRAP FOR OIL-WELL PUMPS.

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To all whom it may concern:

Be it known that I, DE WITT C. KING, a citizen of the United States, residing at the city of Fillmore, county of Ventura, State of California, have invented new and useful Improvements in Traps for Oil-Well Pumps, of which the following is a specification.

In pumping oil wells and especially in deep well pumping there is more or less sand and gas intermingled with the oil as it is pumped. It frequently happens that from some cause the pumping has to be stopped. In such case the well frequently sands up and the pump and tubing must be drawn and the well cleaned which causes expense and loss of time and consequently a decrease in production, and sometimes the pump is lost. Frequently with the apparatus in common use the gas will cause the oil to foam and the efficiency of the pump is decreased and sometimes so much gas accumulates in the pump barrel that suction ceases and pumping stops.

It is the object of my improved trap to reduce the trouble from sanding and gassing to a very large extent.

The drawing forming a part of this application is a longitudinal fragmentary central section partly broken away of my improved trap and the lower end of an oil well pump positioned in an oil well.

Referring to the drawings, 1 is the usual outside casing of an oil well. On the lower end of the pump barrel 2 of the pump described in my Patent No. 1,190,772 of date July 11th, 1916 is a fitting 3, which carries the standing valve shown in said patent. The lower end of fitting 3 is externally threaded for the attachment thereto of the head 4 of my trap. Below fitting 3, head 4 is stepped and the steps are externally threaded. On the upper step numbered 5 is screwed the outer body member 6 of my trap which member consists of a suitable length of tubing provided with a plurality of perforations 7 just below step 5. The bottom of member 6 is closed by plug 8. Below step 5 is step 9 of less diameter than step 5. On step 9 is screwed an outer directing member 10 which consists of a suitable length of tubing which is open at the bottom. Below step 9 is a step 11 of less diameter than step 9. On step 11 is screwed an inner body member 12 which consists of a suitable length of tubing provided with a plurality of perforations 13 near the top thereof. The bottom of member 12 is closed by plug 14. The bottom of head 4 is internally threaded for the reception of the upper end of the internal directing member 15 which is externally threaded and screwed thereinto and consists of a suitable length of tubing.

The perforations in members 6 and 12 should be sufficiently numerous to permit of a ready flow of oil therethrough and the spacings between the several members should permit of a free flow of oil therebetween. The length and diameter of the tubing comprising the several members for a four inch well may be as follows: Member 6, two and one-half inches in diameter and forty feet long. Member 10, two inches in diameter and twenty feet long. Member 12, one and one-half inches in diameter and twenty feet long. Member 15, one inch in diameter and ten feet long. These sizes and lengths may vary but in order that my invention may be availed of, member 6 should extend a sufficient distance below the pump to provide a considerable storage for sand to settle therein. Members 10 and 12 should be of approximately the same length and should be long enough to provide a considerable storage for sand to settle in member 12 and also to cause sand to settle in member 6. In the operation of my trap, member 6 is filled with water up to about a foot above the bottom of member 10. Member 12 is filled with water up to about a foot above the bottom of member 15. In this condition and attached to the pump the pump and trap are lowered into the well. Thereafter as the well is pumped the oil will first enter the trap through perforations 7, then pass down between members 6 and 10, then up between members 10 and 12, then through perforations 13, then down between members 12 and 15, and then up through member 15 into the pump. In its passage down between members 6 and 10 the flow of oil and gravity act on the sand to cause it to go down and the gas in the oil to go up. The water in member 6 acts as a filter medium to cause the separation of the sand and gas from the oil and to cause the sand to go down and the gas up. The upward flow of the oil between members 10 and 12 also permits some settling of sand. The downward flow of the oil between members 12 and 15 and its passage through the water at the bottom of member 15 causes more

sand to settle which is caught in member 12. When member 6 fills up with sand to the bottom of member 10 the pump will stop and it will have to be pulled and the trap emptied of sand. Should it be necessary to stop pumping before member 6 of the trap is filled with sand the pump can not sand up as there will not be sufficient sand in the oil to fill up the other members of the trap. By this construction all danger from losing a pump by sanding is avoided and the well can be pumped longer without pulling the pump than is possible with a pump not provided with my trap.

Having described my invention, I claim:

1. The combination of an oil well pump and a trap, said trap comprising a tubular casing secured upon the bottom of the pump, said casing being perforated at the top and closed at the bottom, a second and shorter and smaller casing open at the bottom and secured to the bottom of the pump within the first casing; a third and smaller casing secured to the bottom of the pump within the second casing, said last casing being perforated at the top and closed at the bottom and of the length of the second casing; and a fourth and still shorter casing open at the bottom secured to the bottom of the pump within said last casing.

2. As a new article of manufacture, a trap for an oil well pump comprising four tubular casings of different diameters and lengths, each being adapted to be attached to an oil pump, the outer and second casing from the outer casing being perforated at the top and closed at the bottom.

3. An oil well trap comprising a stepped head having a central channel therein; an outer tubular member secured to said head, said member being perforated at the top and closed at the bottom and being 192 times as long as its diameter; a second tubular member secured to said head within said first member, said second member being open at the bottom and having a diameter four fifths the diameter of the first member and being 120 times as long as its own diameter; a third tubular member secured to said head within the second member, said third member being perforated at the top and closed at the bottom and being 160 times as long as its diameter, said diameter being three fourths the diameter of the second member; and a fourth member secured to said head within the third member, said fourth member being open at the bottom and being 120 times as long as its diameter said diameter being two thirds the diameter of the third member; the diameter of the outer member being two and one half inches for a seven inch well.

In witness that I claim the foregoing I have hereunto subscribed my name this 8th day of April, 1924.

DE WITT C. KING.