UNIVERSAL STATES PATENT OFFICE.

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SAND-TRAP FOR OIL-WELLS.

1,204,105.

Patented Nov. 7, 1916.

Application filed October 17, 1914. Serial No. 667,197.

To all whom it may concern:

Be it known that I, CLARENCE A. WILEY, citizen of the United States, residing at Tulsa, in the county of Tulsa and State of Oklahoma, have invented certain new and useful Improvements in Sand-Traps for Oil Wells, of which the following is a specification.

This invention relates to pump attachments, and more particularly relates to devices of this character which are adapted to prevent the accumulation of sand above the reciprocating cups of oil well pumps.

It is a particular object of this invention to interpose a novel sand trap between the working barrel of an oil well pump and the dependent tubing in such manner as to free the oil to be drawn to the surface by the cups carried by the reciprocating plunger from sand or other particles of foreign matter.

An object of equal importance with the foregoing is to construct a sand trap of the type described with such regard to proportion, number and arrangement of parts as to render it capable of being cheaply manufactured as well as durable and efficient in operation.

The above and additional objects which will become apparent as this explanatory description proceeds are accomplished by such means as are illustrated in the accompanying drawings, described in the following specification and then more particularly pointed out in the claim which is appended hereto and forms a part of this specification.

With reference to the drawings, wherein there is illustrated the preferred embodiment of this invention as it is reduced to practice, and throughout the several views of which like characters of reference designate similar parts:

Figure 1 is a vertical section through the casing of an oil well showing positioned therein in elevation a pump equipped with the novel improvement comprehended by this invention, and Fig. 2 is a similar view but enlarged and showing also the pump casing in section.

There is illustrated an oil well casing 5, in which there is vertically positioned tubing 6 of much smaller diameter than the casing 5 and connected to a working barrel 7 in which there is adapted to vertically reciprocate the plunger 8 more commonly termed a sucker rod and carrying the oil lifting cups 9, all in the usual manner and of well-known construction.

Before proceeding to the detail description of the sand trap, the provision of which with the structure just described is contemplated by this invention a brief survey of the necessity for a device of this character as well as of its advantages may be undertaken. In the operation of the majority of oil wells one of the chiefest items of large expenditure after the well has once been put in working order is due to the presence of sand and its detrimental action upon the working parts of the pump, such sand being delivered with the oil from the oil bearing rock or sand in sufficient quantities to necessitate the frequent removal of the rods and tubing from the well for the purpose of cleaning the sand from around the valves, an expensive operation the frequency of which also results in a still greater loss in production.

It is within the knowledge of the present inventor that devices have before been presented which attempt to trap the sand and prevent its accumulation around the valves and its wear upon the cups of the reciprocating plunger but such devices have never come into general use owing to their lack of practical value since most of them call for the positioning of check valves or similar means in the tubing itself which while preventing to some extent the action of the sand upon the pump elements do not nevertheless conduce to a more effective operation of the pump as a whole since they themselves are too readily rendered inoperative by the accumulation of the sand in their own working parts.

In the drawings, the numeral 10 designates an enlarged settling chamber remotely connected to the working barrel 7 by the tapered portion 11 and suitable threaded collars 12, which also support in alignment with the working barrel and the portion 11, and interposed therebetween, a suitable removable pipe section 13. A tapered portion 18 is similarly carried by the settling chamber 10 at its lower mouth and is adapted to threadingly receive the intermediate portion of the piping section 14 which extends upwardly into the chamber 10 as illustrated and is formed on its lower projecting portion 15 with the customary perforation 16 which former is sunk into the oil bearing strata. A cage 17 is posi-
tioned upon the upward extremity of the pipe 14 interiorly of the chamber 10 and is adapted to operatively maintain a ball valve 18, thus completing a simple structure by which it has been found upon reduction to practice that the objects of this invention may be most readily accomplished at a minimum cost.

It will be understood of course that the plunger 8 constitutes a traveling valve operable between an upper valve fixed in the tubing 6, (not shown) and the lower valve 18 which heretofore has been positioned directly in the pipe 14 and about which the largest accumulation of sand is deposited. By means of the construction shown and disclosed in this invention, however, no accumulation of sand drawn up to the perforated piping 15 and 14 about this valve is possible since the upward action of the traveling valve will leave the sand in the chamber 10 free to settle in the portion 13 as indicated in Fig. 2 so that previous difficulties encountered due to the wearing action of the sand on the cups 9 and the valves is completely obviated so as to necessitate the replacing of these parts only at comparatively infrequent intervals, thus attaining the objects previously set forth.

While in the foregoing however, there has thus been illustrated in the drawings and described in the specification such combination and arrangement of elements as constitute the preferred embodiment of this invention, it is desired to emphasize the fact that such minor changes in the matters of proportion and degree may be made in later adaptations of this device as shall not alter the spirit of the invention as defined in the appended claim.

What is claimed is:

In a sand trap for oil well pumps, a working barrel, and an aligned and perforated intake pipe spaced from said barrel, an enlarged settling chamber formed of a plurality of annular sections, threaded collars connecting the opposing ends of said sections, a valve on the upper end of said intake pipe extending within said settling chamber to a point near the connected ends of two of said annular sections to permit easy access to said valve by separating said sections, and reduced ends on the settling chamber connected to the working valve and to the intake valve.

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

CLARENCE A. WILEY.

Witnesses:

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