Feb. 28, 1950 C. R. CLAYTON 2,498,913

SAND SEPARATOR

Filed April 5, 1948

Fig. 1.

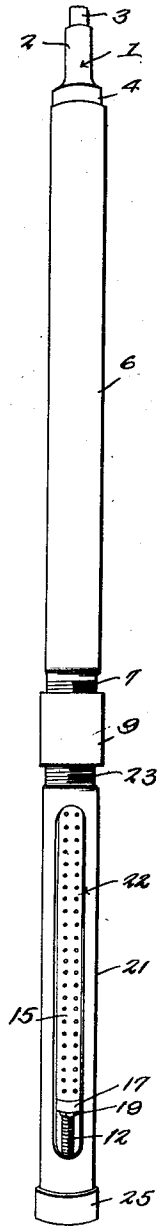


Fig. 2.

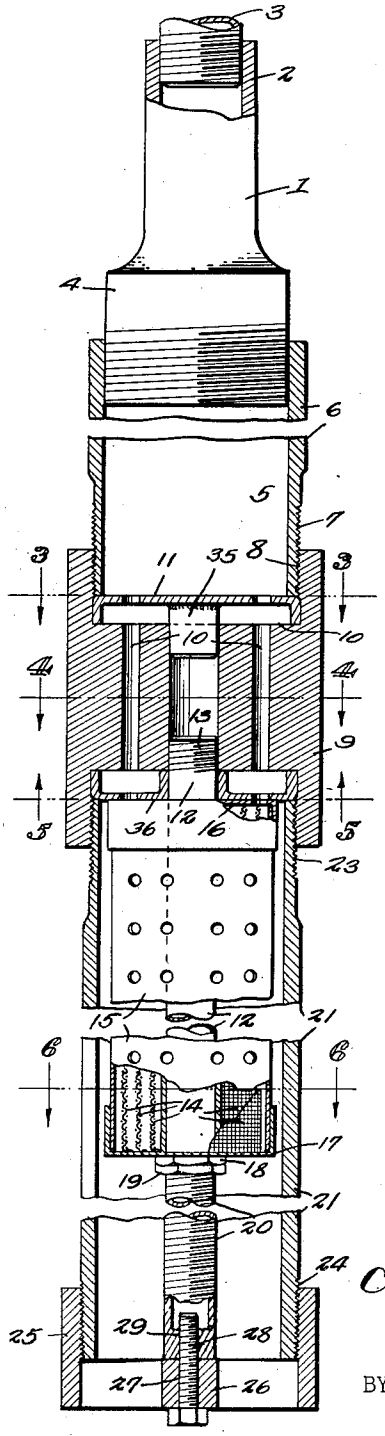


Fig. 3.

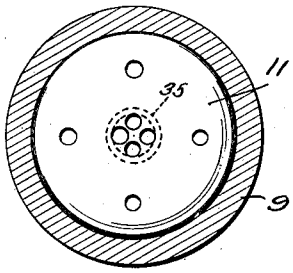


Fig. 4.

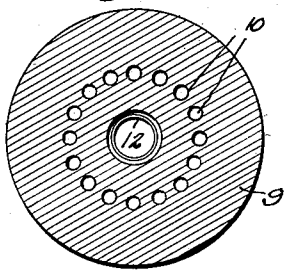


Fig. 5.

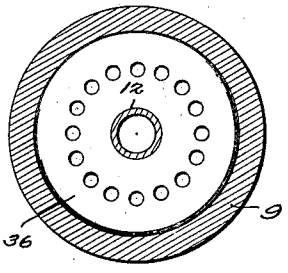
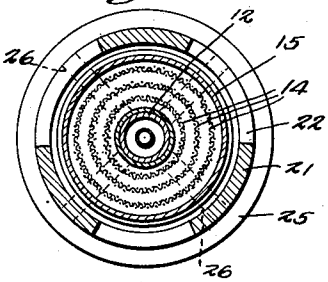


Fig. 6.



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Patented Feb. 28, 1950 2,498,913

UNITED STATES PATENT OFFICE

2,498,913

SAND SEPARATOR

Clarence R. Clayton, Snomac, Okla.

Application April 5, 1948, Serial No. 19,128

2 Claims. (Cl. 103—220)

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This invention relates to improvements in sand separators for oil wells.

An object of the invention is to provide an improved sand separator for separating sand from oil where an oil well makes sand.

Another object of the invention is to provide an improved form of sand separator for oil wells which make sand by keeping sand from getting into the pumping barrel, positively eliminating pumping cup and stuffing box rubbers and other foreign objects from getting into or entering into the tubing.

A further object of the invention is to provide an improved sand separator for separating sand from oil where an oil well makes sand which will be highly efficient in operation and relatively inexpensive to manufacture and produce.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts, hereinafter more fully described and pointed out in the claims, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawing

Figure 1 is a side elevation of the improved sand separator.

Figure 2 is a vertical sectional view through the improved sand separator.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a sectional view taken on the line 5—5 of Figure 2.

Figure 6 is a sectional view taken on the line 6—6 of Figure 2.

Like characters of reference are used throughout the following specification and the accompanying drawing to designate corresponding parts.

In carrying out the invention, there is provided an improved form of sand separator for use for separating sand from oil being pumped from oil wells making sand.

A combination upset adapter coupling 1 having a reduced internally threaded upper end 2 will be threaded upon the section of pipe 3 connected with the seat of the sub-surface pump (not shown). The enlarged lower end 4 of the coupling 1 is externally threaded for threading into the internally threaded upper end of the elongated upper fluid chamber 5 composed of a

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section of predetermined length of pipe 6 and forming the sub-surface pump's intake reservoir for sand-free and filtered fluid.

The externally threaded lower end 7 of the pipe 6 is adapted to thread into the internally threaded upper end 8 of the adapter coupling 9, which comprises a perforated seat member 10 disposed within the adapter coupling 9 and a cooperating movable perforated plate 11 having a guide stem 35, the coupling 9 operating to cause the pressurized fluid within the production string tubing (not shown), after the sub-surface pump (not shown) has been unseated or lifted from normal operating seating position, to be diverted through the perforations in the perforated member 10 of the coupling 9 and through the perforated lower plate 36 into the filter screen section disposed therebelow and now to be described, thus accomplishing a flushing and washing action upon the sand grains or other foreign matter which have accumulated outside the filter element.

The filter element is supported upon a length of smaller pipe 12 which forms an inner barrel filter guide and support which may or may not be perforated, and is threaded as at 13 on its upper end for threading into the coupling 9.

The filter element is formed of a plurality of concentrically disposed wire mesh sleeves 14, and an outer perforated heavy metal sleeve or jacket 15, the same being supported at its upper end by the perforated and grooved top plate 16 and at its bottom end by the solid plate 17 which is centrally bored to extend about the inner barrel 12. The filter element is supported upon the inner barrel 12 by means of the hexagonal jamb nut 18 and locking nut 19 threaded upon the externally threaded end at 20 adjacent its lower end.

An outer jacket 21 is slotted at 22 and is externally threaded at 23 on its upper end for threading into the lower internally threaded end of the adapter coupling 9. The lower end of said outer jacket 21 is externally threaded at 24 on its lower end for receiving and supporting the internally threaded bottom filter support 25 composed of a heavy coupling with welded cross segments 26 extending across its lower end, with an axially disposed threaded opening 27 formed therethrough for receiving the threaded bolt 28 which extends upwardly through the opening 27 and into a threaded opening 29 in the lower end of the inner barrel 12, thus securing the several parts in assembled position. It is obvious that

the filter parts may be quickly disassembled for cleaning or replacement of worn parts.

In operation, the fluid passing through plate 11 and lower plate 36 washes off sand grains from the filter element without the employing of special fishing tools and additional devices to aid in the accomplishing of bottom hole filter cleaning and washing.

The sub-surface pump (not shown) is unseated and permits the fluid column, normally the height of the production string of tubes, to flow downwardly towards the perforated plate 11 to be controlled thereby as it passes therethrough to effect the cleaning and washing of the filter.

While the preferred embodiment of the instant invention has been illustrated and described, it will be understood that it is not intended to limit the scope of the invention thereto, as many minor changes in detail of construction may be resorted to without departure from the spirit of the invention.

What is claimed is:

1. A sand separator for oil wells, comprising a pipe section forming an intake reservoir for a subsurface pump, an adapter coupling secured on the lower end of the pipe section, said adapter coupling having a central bore and having a circular line of vertical bores surrounding the central bore, a circular perforated plate disposed at each end of the adapter coupling in spaced relation with the adapter coupling, a hollow guide stem formed integral with the circular perforated plate at one end of the adapter coupling and fitted in the central bore of the adapter coupling through which fluid passes to the central bore, said circular plates having circular lines of openings aligning with the circular line of openings in the adapter coupling through which sand ladened fluid is forced as the separator reciprocates, a pipe extending into the lower end of the central bore of the adapter coupling over which

the circular plate at the lower end of the adapter coupling is mounted, a plurality of spaced concentrically arranged perforated filter sleeves disposed around said pipe and secured thereto in spaced relation with each other, a perforated sleeve encasing the filter surface through which fluid flows on its passage to the adapter coupling, an outer open ended jacket surrounding the sleeves in spaced relation therewith, and said jacket having spaced longitudinally disposed slots formed in the wall thereof.

2. A sand separator for oil wells, comprising a pipe section forming an intake reservoir for a subsurface pump, an adapter coupling secured to the pipe section, said adapter coupling having a large central bore and a circular line of bores surrounding the central bore, the bores extending through the adapter coupling, a disc-like plate secured at each end of the adapter coupling, said disc-like plates having openings registering with the bores of the adapter coupling and through which fluid passes through the separator, spaced filter sleeves disposed within one another, supported by the adapter coupling, and an outer jacket surrounding the spaced filter sleeves in spaced relation with the filter sleeves, and said jacket having slots disposed longitudinally thereof, through which fluid passes to the separator.

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