

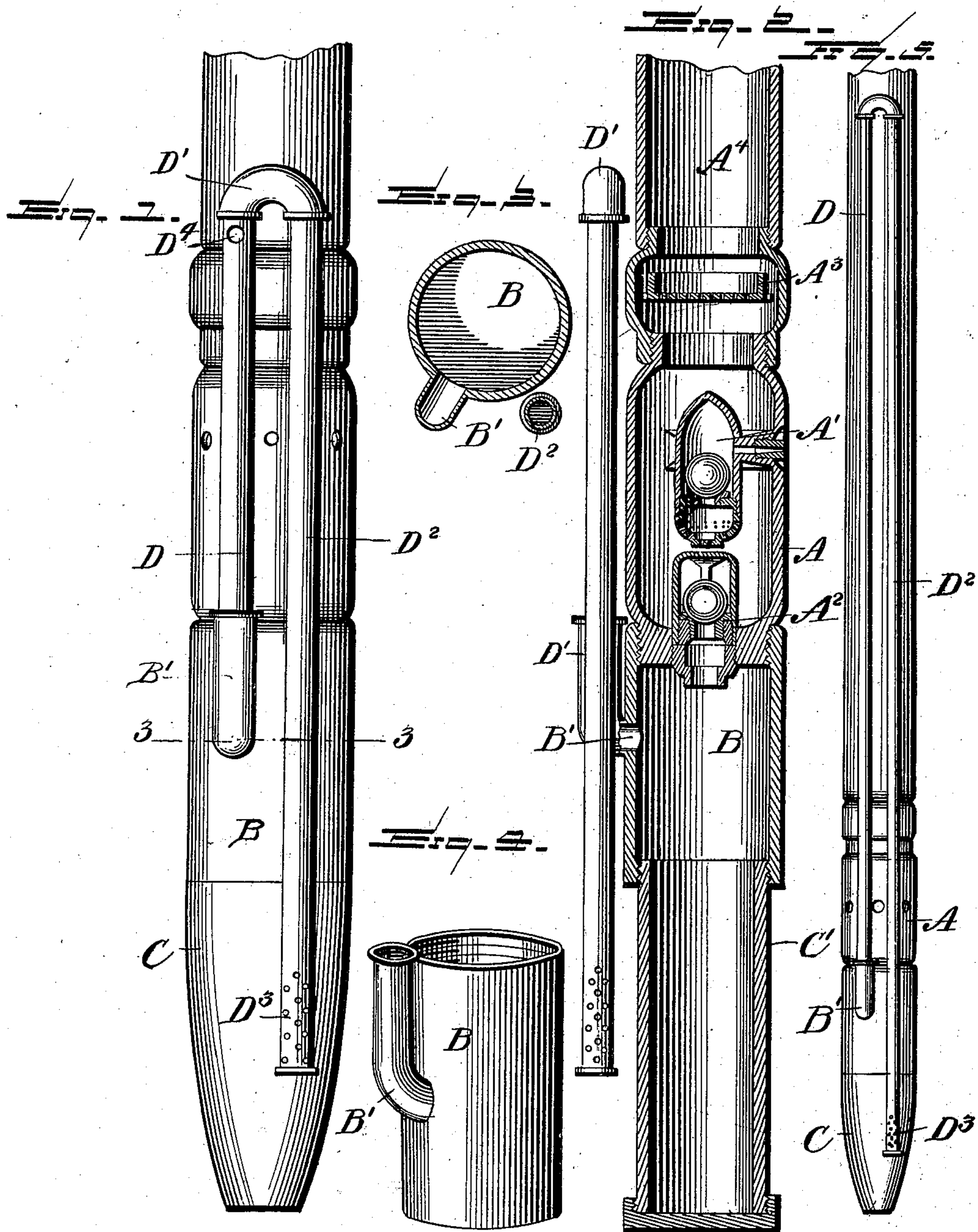
No. 692,758.

Patented Feb. 4, 1902.

A. E. BARNHART.
OIL SAND FLOODER.

(Application filed May 20, 1901.)

(No Model.)



WITNESSES:

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OIL-SAND FLOODER.

SPECIFICATION forming part of Letters Patent No. 692,758, dated February 4, 1902.

Application filed May 20, 1901. Serial No. 61,112. (No model.)

To all whom it may concern:

Be it known that I, AARON E. BARNHART, a citizen of the United States, residing at Millerstown, in the county of Butler, State of Pennsylvania, have invented certain new and useful Improvements in Oil-Sand Flooders, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to oil-sand flooders, and particularly to a fitting or attachment adapted for application to the ordinary construction of suction-pipes used in oil-wells.

15 The invention has for an object to provide a simple and economical construction of parts occupying the least possible amount of space and adapted to be applied below the working barrel of the suction-pipe of an oil-well, so as to prevent the exhausting of the oil-supply and the consequent action of the air upon the oil-bearing strata of sand, which causes a thickening of the oil, thereby clogging the strata and seriously diminishing the pumping capacity thereof.

20 A further object of the invention is to provide such an attachment which will prevent the collection of the gas either beneath the working barrel of the pump or beneath the level of the oil within the well.

25 Other objects and advantages of the invention will hereinafter appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

30 In the drawings, Figure 1 is a side elevation of my attachment applied beneath the sprayer located at the lower end of a suction-pipe. Fig. 2 is a vertical section. Fig. 3 is a horizontal section on the line 3-3 of Fig. 1. Fig. 4 is a detail perspective of the coupling for the flooder attachment, and Fig. 5 is a detail elevation of a modified form of the invention.

35 Like letters of reference indicate like parts throughout the several figures of the drawings.

40 While this invention is applicable to different forms of suction-pipes and oil-elevating devices, it is particularly adapted and constructed for use in connection with the working barrel and sprayer mechanism shown in

my prior patent, No. 464,785, of December 8, 1891, and with the rivet-catching device disclosed in my Patent No. 665,772, of January 8, 1891.

55 In the drawings the letter A designates the shell or cylinder containing the sprayer mechanism A', which is similar in construction to that disclosed in my patent above mentioned and having at its lower portion the foot-valve A², as therein disclosed. The upper portion of this sprayer mechanism is provided with the rivet-catching device A³, supported within a casing, which is suitably threaded at the opposite ends for coupling to a suction-pipe A⁴ and the shell A. The parts just described comprise the working barrel of my pumping mechanism, and their operation in the present instance is similar to that disclosed in the patents mentioned. The lower portion of this cylinder A is suitably threaded, and connected thereto is a cylindrical coupling B, forming a portion of the improved flooding device. This coupling is provided at one side between its ends with an inlet B', extending upward parallel with the length of the coupling, and is suitably threaded at its opposite ends, one of which engages the casing A and the other the anchor-block section C, which may be of any usual construction and length, either solid, Fig. 1, or hollow, as at C', Fig. 2.

60 Connecting with the inlet B' for the coupling B and communicating with the oil-chamber therein is a vertically-disposed pipe D, connected at its upper end by a return-bend D' with a depending suction-pipe D², perforated at its lower portion in the usual manner, as shown at D³. The pipe D in passing upward lies between two of the outlets from the sprayer device A', and the depending leg D² of said pipe is similarly disposed, so as not to interfere with the spray from said device. This intake-pipe extends upward above the sprayer device and working barrel and adjacent to the return-bend D' is provided with an air-inlet D⁴, so that when the oil falls below this level the air may enter the intake-pipe and prevent the further lifting of oil by the pump, which if continued would exhaust the well. It will also be noted that the chamber formed by the coupling B, connected to the working barrel and anchor, is completely

closed with the exception of the inlet connection B', so that the feed for the pump is only through the pipes D² and D into the coupling B.

5 As shown in Figs. 1 and 2, the intake-pipes are provided with the aperture D¹ to regulate the level to which the oil may be pumped, while in the modification shown in Fig. 5 this aperture is omitted and the length of pipe
10 continued to a height substantially equal to the lifting height of the pump. In this form when the oil-level within the well is at its proper height the oil will rise in the leg D² of the intake-pipe to a sufficient height to
15 permit the pumping action through the pipe D into the coupling B. As soon as the oil-level falls below the predetermined line in this pipe D² the distance between the level of oil and the working barrel of the pump will
20 be such that the oil cannot be raised thereby. It should be explained that under ordinary conditions the diameter of oil-wells varies from five inches to six and one-fourth inches, and it is therefore an element of essential im-
25 portance that any flooder-pipe connections must be contained within the smallest possible space, so as to be inserted in the well and to operate therein without interfering with the operation of the other parts or prevent-
30 ing the withdrawal of the tubing when it becomes necessary. It is also very important in this class of devices that the spraying action should be continued beneath the level of the body of oil within the well or within the
35 body thereof, so that the oil-sand is protected from the air by the liquid in the well while the spraying-jet agitates the body of liquid, so as to produce the most desired feeding action, and removes from the sand any clog-
40 ging substances which may collect during the flow of the oil. It will therefore be seen that there is an important and essential relation between the use of an automatic spraying device and means for maintaining a level of oil
45 above the injection-openings from said sprayer. Another difficulty occurring in the pumping of oil-wells is the collection of gas beneath the body of oil, whereby the oil is supported at a false level, and as soon as the
50 gas escapes the level of the oil suddenly drops, so that the well becomes exhausted before the pumping action can be stopped. With the present invention the perforations D³ from the intake-tube D² permit the escape of gas
55 through opening D in said tube, so as to establish an equal pressure of the air and gas upon both the upper and lower surfaces of the oil. In the pumping operation it will also be
60 of the anchor C first removes from the well

the water beneath the body of oil, which can be discharged from the pump in any desired manner, and then continues the pumping of the oil so long as the level of the same continues above a predetermined line. It will
65 also be observed that when it is used in connection with a spraying device it is essential that the oil shall be discharged from the intake-pipe into a closed chamber beneath the spraying device and working barrel, as to ad-
70 mit the air above said sprayer would defeat the operation of the same. To prevent injury to the end D³ of the intake-pipe, it does not extend to the bottom of the well or beyond the anchor-section, as injury to the in-
75 take would occur if so extended.

It will be obvious that changes may be made in the details of construction and configuration and of the working barrel to which the coupling is applied without departing from
80 the spirit of the invention as defined by the appended claims.

Having described my invention, what I claim as new is—

1. In an oil-sand flooder, the combination
85 with a suction-pipe and working barrel having a foot-valve, of a coupling secured at the lower end thereof to form a receiving-chamber, an anchor-section at the lower end of said coupling, an inlet communicating with
90 said coupling between its ends, an intake-pipe connected to said inlet and extending above the level of said foot-valve, and a suction-leg to said intake extending below said coupling; substantially as specified.

2. A coupling for a working barrel and anchor-section of an oil-sand flooder comprising an open cylindrical section threaded at opposite ends, and an intake connection extending parallel with the outer periphery of said
100 coupling toward one end thereof and communicating at its opposite end with the coupling between its ends; substantially as specified.

3. In an oil-sand flooder, the combination
105 with a working barrel containing a sprayer device and having a threaded lower end, a coupling threaded to said end and to an anchor-section, an inlet communicating with said coupling between its ends, an intake-pipe connected to said inlet and having an open-
110 ing therein above said sprayer device, and a suction-leg to said intake extending below the point of connection with said coupling; substantially as specified.

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

AARON E. BARNHART.

Witnesses:

GEORGE P. TADDER,

FREDERICK W. JACKSON.