

A. E. PUTNAM.
 SUCTION DEVICE FOR WELLS.
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1,069,466.

Patented Aug. 5, 1913.

Fig. 1.

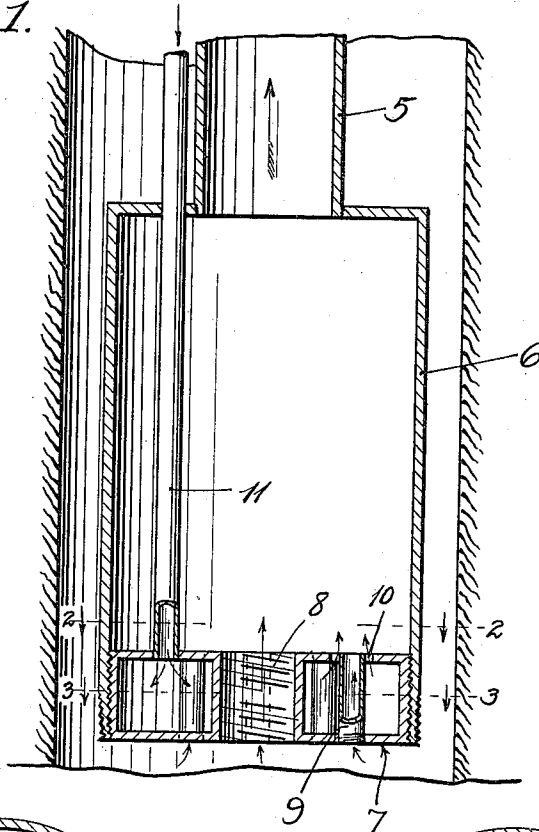


Fig. 2.

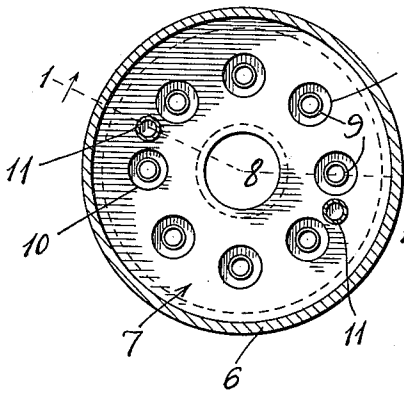


Fig. 4.

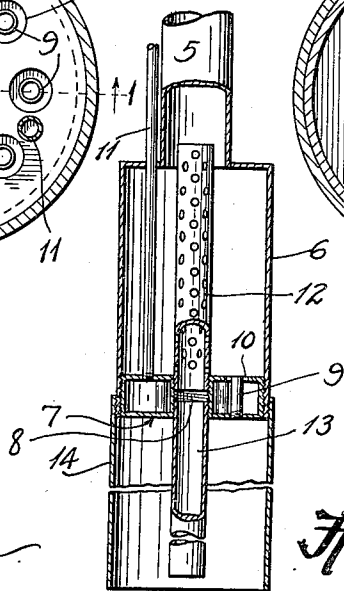
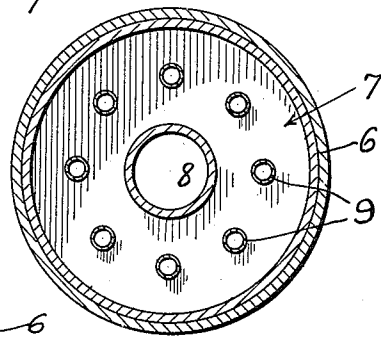


Fig. 3.



Witnesses:

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SUCTION DEVICE FOR WELLS.

1,069,466.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ALBERT E. PUTNAM, a citizen of Canada, residing in the city of Redlands, county of San Bernardino, and State of California, have invented new and useful Improvements in Suction Devices for Wells, of which the following is a specification.

This invention relates to improvements in suction devices for wells, and particularly to mechanism which may be placed within the bore of a well, and is arranged to have air under pressure forced into the same in such a manner as to be capable of entraining a stream of water or other liquid from the well.

It is also a further object of the invention to provide a pumping device which may be located in the bore of well, the said device having a series of nozzles around which air may be forced, or discharged in an upward direction for delivering or entraining the liquids in the well through an upwardly extending discharge pipe.

In the accompanying drawing forming a part of this specification, Figure 1 is a detail sectional view taken vertically through a portion of a well bore and showing the suction mechanism mounted therein, said section being taken upon line 1—1 of Fig. 2. Fig. 2 is a transverse sectional view through the pumping or suction mechanism taken upon the line 2—2 of Fig. 1. Fig. 3 is a central transverse section view taken upon the line 3—3 of Fig. 1. Fig. 4 is a detail vertical central sectional view through a suction mechanism of a modified form.

The details and features of the invention will now be specifically described reference being had to the accompanying drawings, in which—

5 indicates an uptake or discharge pipe for directing and delivering liquids from a well bore. 6 indicates a casing carried by the said pipe 5 and adapted to be lowered and properly positioned in the bore of a well for engaging the liquids therein. The casing 6 is arranged to be closed at its lower end by a nozzle member 7 which is usually formed with a screw threaded periphery adapted to be secured in the threaded end of the casing 6. The said nozzle member 7 is in the form of a hollow casing having a central passage 8 through which the liquids from the well pass in being forced upward

from the said well. The lower wall of the said casing 7 is provided with a series of tubular nozzles 9 which are opened from end to end and extend from the said lower wall in which they are fixed to points opposite the upper wall of said casing 7. The said upper wall of the casing 7 is formed with openings surrounding the nozzles 9, said openings being of a sufficiently large diameter to provide annular passages 10, about the upper ends of said nozzles as will be clearly understood by reference to Figs. 1 and 2 of drawing. Preferably a series of said nozzles and passages 10 are arranged around the central opening or passage 8.

The casing 7 forms an air chamber which is adapted to receive air under pressure through one or more pipes 11 which extend into the bore of the well from any suitable compressed air supply mechanism not shown, the lower ends of the said pipes 11 being screwed into threaded apertures formed in the upper wall of the casing 7. When the device is located in a well and air or other suction producing agent is forced downwardly through the pipes 11, it will issue from the annular passages 10 in an upward direction so as to produce a suction above the nozzles 9 and cause the water or other liquids in the well to be drawn through the nozzles and forced upwardly in the casing 6 and the pipe 5. In this manner a number of streams are entrained above the openings 10 and water or liquids will be aerated and caused to pass through the central passage 8 until the pipe 5 is practically filled with a column of aerated liquid, a double action being produced, by the ejectors and water entering the passage 8.

The mechanism above described may be further modified in its action and effect by screwing in the upper end of passage 8 a perforated pipe 12, the lower end of which is exteriorly threaded so that it may be screwed upon threads formed in the passage 8. The pipe 12 is preferably made of sufficient length to have its upper end extend a short distance into the lower end of pipe 5 as clearly shown in Fig. 4. In this instance also a pipe 13 is generally secured in the lower end of the passage 8 and allowed to project to any desired distance below the casing 7 and the said pipe may be carried to a part near the bottom of the well if desired. When using the pipes 12 and 13 the mechanism is also generally pro-

vided with a lower casing or pipe 14 which is threaded upon the lower end of the casing 6 as shown in Fig. 3, and the said casing 14 may be carried to any desired depth in the well. The action of the mechanism is practically the same as that of the first form of the mechanism described. The entrained jets surrounding the perforated pipe 12 will establish a suction in the discharge pipe 5 and the pipe 12, which will draw the water or other liquid through the said pipe in a similar manner to that described with reference to the mechanism shown in Fig. 1.

It will be observed that the mechanism may thus be altered to adapt it to wells of various depths, either by lengthening the pipe 5 and pipes 11 so as to locate the casing 6 deep in the well, or by using lengthening pipe sections 13 and 14, in reaching the deeper portions of the well, all within the spirit of the invention.

What is claimed is:—

1. A suction device comprising a casing having a removable transverse head secured therein, said head having nozzles passing through it and having an air chamber formed within it whereby air may be permitted to escape under pressure around the said nozzles, and means for delivering air under pressure to the said air chamber.

2. A pumping device for wells comprising a casing adapted to be lowered into the bore of a well and having an outlet discharge pipe extending upwardly therefrom, a hollow member forming a transverse head in said casing and having openings in its upper wall, one or more nozzles mounted in said member and extending into said air openings and means for supplying the hollow member with air under pressure where-

by jets of water may be entrained upwardly in the said casing for delivering the water from the well.

3. A well suction device comprising a casing adapted to be secured in a well, a discharge pipe supporting the same in said well, a hollow nozzle member having a central passage for the liquids to be pumped, a series of hollow nozzles being secured in the lower wall of the nozzle member and extending to points opposite the upper wall thereof, the said upper wall having passages forming annular discharge openings around said nozzles and a pressure producing pipe extending to said nozzle member from any pressure supply means.

4. A suction device for wells comprising a casing adapted to be lowered into a well and having a discharge pipe extending to the surface of the ground, a nozzle member mounted in said casing and having hollow nozzles extending through the same, the said casing having air outlet passages surrounding the said nozzles, a pipe for supplying air under pressure to said nozzle member the nozzle member also having a passage extending through the same, a perforated pipe mounted in said passage and extending through the said casing, a suction pipe also mounted in said central passage and extending toward the bottom of the well and an outer depending casing carried by the first mentioned casing.

In witness that I claim the foregoing I have hereunto subscribed my name this 23 day of October, 1911.

ALBERT E. PUTNAM.

Witnesses:

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IRENE M. LAMB.