Jan. 15, 1929.

1,699,072

J. KINNEY, JR

WELL DEVELOPER

Filed June 13, 1927

FIG 1

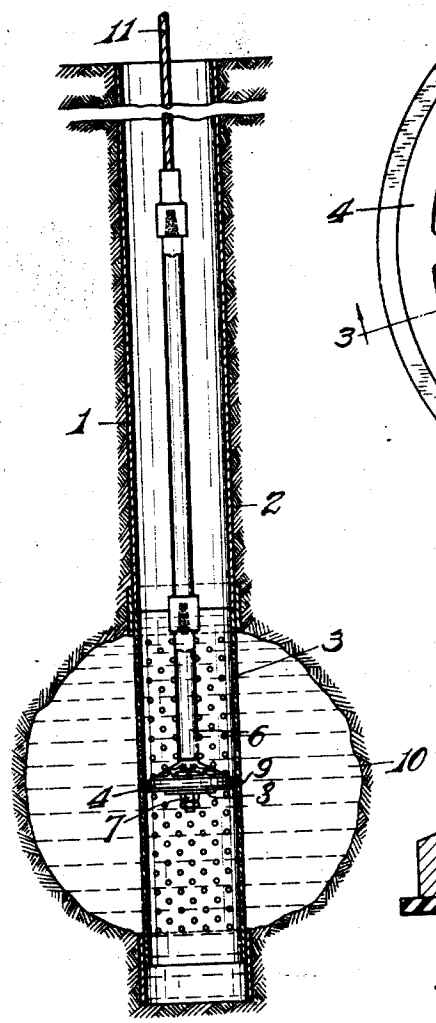


FIG 2

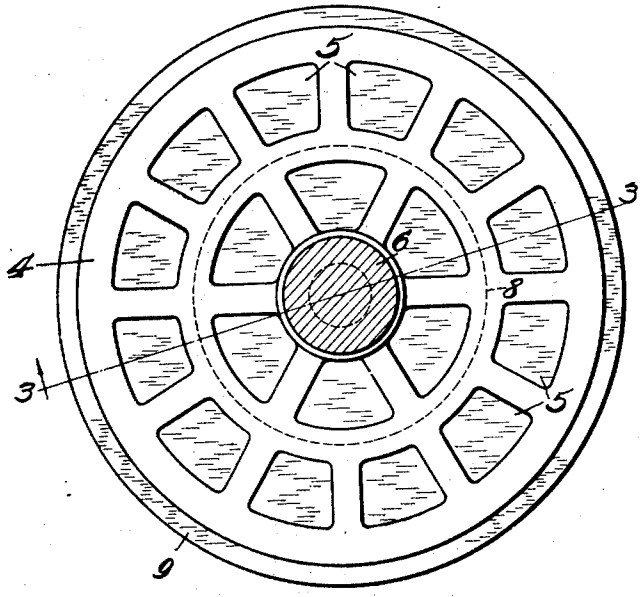
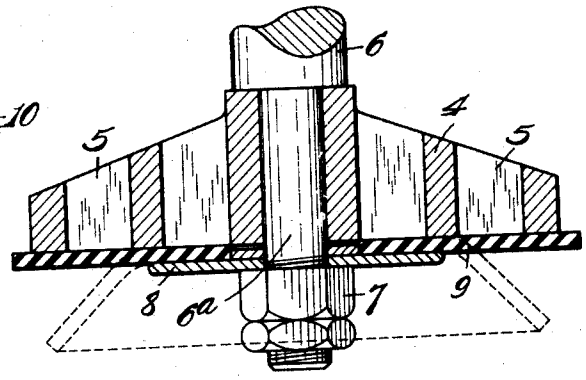


FIG 3



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Patented Jan. 15, 1929. 1,699,072

UNITED STATES PATENT OFFICE.

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WELL DEVELOPER.

Application filed June 13, 1927. Serial No. 198,321.

This invention relates broadly to artesian well tools, and more specifically to a basin developing tool for such wells.

The primary object of the invention is to provide a device, hereinafter termed a "well developer", by means of which strata of sand, gravel or clay surrounding the usual perforated casing section, or screen, of a water well may be coveniently collected for removal to form a water collecting basin or reservoir.

As is well known in the art, in order to obtain an approximate maximum flow or capacity in water wells, it is necessary not only to maintain the apertures or perforations in the screen free and unobstructed, but also to provide around said screen a fluid receiving basin or reservoir of maximum capacity. And it is the object of this invention to provide a tool by means of which sand surrounding the screen may be collected or deposited within the bottom end of the well, whence it may readily be removed by the use of a bailer or pump.

In describing the invention in detail, reference is herein had to the accompanying drawings, in which—

Figure 1 is a sectional view of a well, illustrating the application of my invention;

Figure 2 is an enlarged top plan view of the invention; and—

Figure 3 is a section on line 3—3, Fig. 2.

Referring to said drawings, 1 designates a line of well casing disposed in a well 2 and having therein adjacent to the bottom of the well, or in the water-bearing stratum of the latter, a perforated section, or screen, 3 for the admission of the water to be pumped.

Suspended for reciprocating movement within the screen 3 is an agitator which comprises a circular plunger-like body 4 having numerous apertures or holes 5 extending vertically therethrough. Said body, which preferably has a diameter somewhat less than that of the screen, has a central hub portion 4^a mounted upon the reduced lower end 6^a of a stem 6 attached to or depending from the drilling cable 11, an attaching nut 7 being threaded upon said reduced end of the stem 6 against a plate or washer 8 which underlies said body. A circular disk 9 of a suitable flexible material, as rubber, is interposed between said washer 8 and the body 4 having a diameter approximating that of the screen and serving as a check valve. Said disk or valve is adapted, in downward movement of the agitator within the screen, to seat closely against the under face of said body for closing the holes 5, and, in upward movement of the agitator to be bent downward, or away from, said agitator to open said holes.

In practice, when it is desired to form a basin, as 10, in the fluid-bearing sand to which the screen is disposed, thus materially to increase the yield of the well, the agitator is rapidly raised and lowered, or reciprocated, within said screen. As the agitator descends, the fluid contained within the screen below the agitator is displaced, being forced outward through the perforations below the agitator and at the same time water from the basin enters through perforations above the agitator carrying therewith in suspension sand from without the screen. Then, as the agitator is elevated, the flexible disk 9 is bent downward, uncovering the holes of the agitator so that the water and sand may pass unobstructedly therethrough to allow said sand to deposit within the lower end of the well.

Is is to be noted that the agitation of the water produced by the reciprocating movements of the agitator is sufficiently violent to effect rapid dislodgment of the sand surrounding the screen and that, as a result, the deposit of sand within the bottom of the well, as above described, is accomplished rapidly and continuously.

What is claimed is—

1. A well developer comprising, in combination with a perforated screen of a well casing, a plunger-like agitator body suspended for reciprocating movements within said screen, said body having passages extending therethrough, and a flexible disk-like valve disposed in underlying relation to said body and having a diameter approximating that of said screen, said valve being adapted, in downward movement of said body, to close said passages so that water displaced in the descent is forced outward through the perforations of said screen, and being adapted, in upward movement of said body, to be bent downward into opening relation to said passages, thereby to permit water above said body to pass downward through said passages to deposit within the bottom of the well sand carried in suspension by the water.

2. A well developer comprising, in combination with a perforated screen of a well casing, a plunger-like agitator body suspended from a drilling cable and adapted for

reciprocation within said screen, said body being provided with vertical passages, and a flexible disk-like check valve supported concentrically with and in underlying seated relation to said body for closing said passages during descent of said body, said valve having a diameter approximating that of the strainer and being adapted to be unseated for opening said passages during upward movement of said body, thereby to permit water above said body to pass downward for depositing within the bottom of the well matter carried in suspension.

3. A well developer comprising, in combination with a perforated screen of a well casing, a plunger-like agitator body suspended for reciprocating movements within said screen, said body having passages extending therethrough, and a disk-like valve of flexible material supported concentrically upon and normally disposed in seated passage-closing relation to a face of said body, said body being adapted, in reciprocating movements thereof, to create a rapid circulation of water to and from the interior of the screen through the perforations of the latter, and said valve being adapted in such movements alternately to open and close said passages for effecting the deposit within the bottom of the well of sand carried in suspension by the circulated water.

In testimony whereof, I affix my signature.

JAMES KINNEY, JR.