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WELL CEMENTING DEVICE

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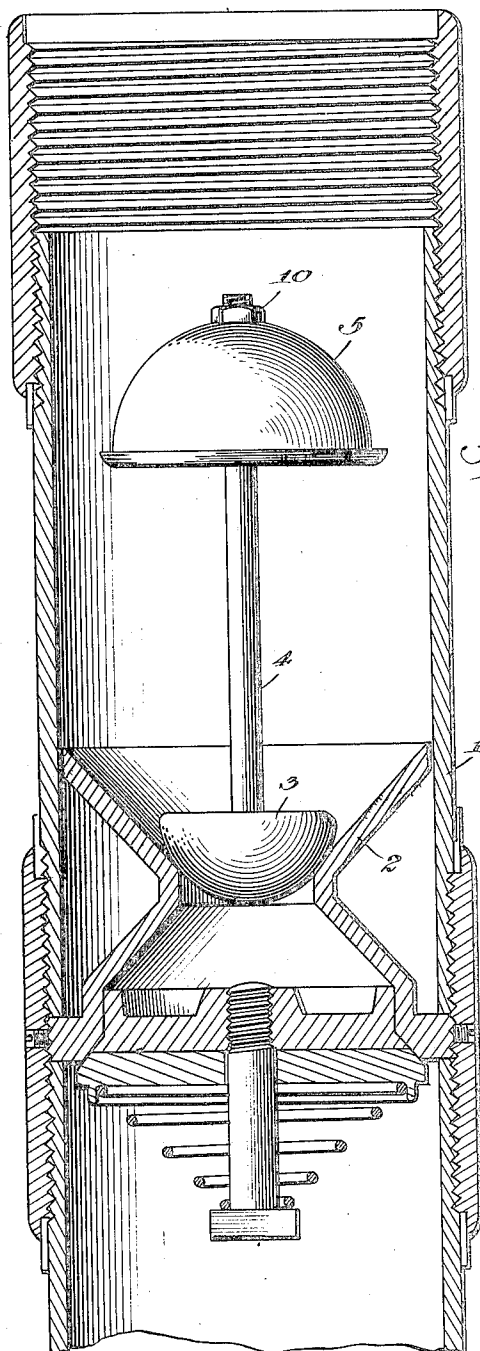


Fig. 1.

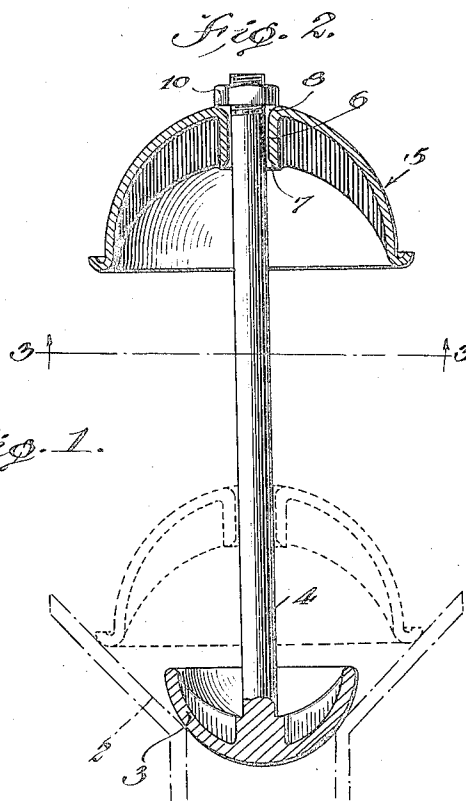
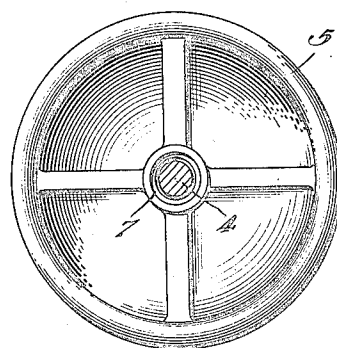


Fig. 2.



WITNESSES

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WELL-CEMENTING DEVICE.

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This invention relates in general to a cementing device for use in carrying out the methods for cementing wells forming the subject-matter of my co-pending applications filed October 1, 1925, Serial Numbers 59,887 and 59,888, and the present invention relates particularly to a novel form of valve assembly co-operable with the valve seat within the well casing and designed to stall the pump so as to advise the operator that the cementing has all been forced below the valve seat located adjacent the point of discharge as well as to prevent further flow of the cement.

One of the principal objects of the present invention resides in the provision of a simple form of valve assembly which necessitates the provision of only one valve seat in the casing but which insures a proper seal at the proper time.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part of this specification, and in which:

Figure 1 is a fragmentary sectional view showing a valve assembly constructed in accordance with the present invention and illustrating the same co-acting with its seat, a fragment of the well casing and parts carried thereby being shown.

Figure 2 is a view partly in elevation and partly in section showing the valve assembly, and

Figure 3 is a detail view in section on the line 3—3 of Figure 2.

Referring to the drawings the numeral 1 designates the cementing discharge device, the construction of which is more fully shown and described in an application executed under even date with the present case and identified as case Number 1. The cement device has a seat 2 for the valve assembly.

The valve assembly includes a main valve member 3 having the form of a cup and integral with or suitably fixed to the lower end of the stem 4. A movable valve member 5 is provided and has a flanged opening 6 at its center. The valve member 5 is also in the form of a cup. The flanged opening 6 of the valve member 5 receives the stem 4, the stem 4 being a free sliding fit in the flanged

opening 6. The end portions of the wall of the flanged opening 6 are beveled, as shown at 7 and 8 in Figure 2, so as to preclude the possibility of the valve member 5 sticking or freezing on the stem 4. A nut 10 threaded on the upper end of the stem 4 prevents displacement of the valve member 5 from the stem. The entire valve assembly is lighter than cement and heavier than mud fluid so that the assembly will sink in the mud fluid but will float in the upper portion of the cement. The main valve member 3 is slightly heavier than the cement so that it will sink into the cement a short distance but the movable auxiliary valve member 5 is lighter than the cement so that it will float above the same and will be retained adjacent the nut 10 and spaced a considerable distance from the valve member 3.

In operation the cement is first placed in the well casing in accordance with the method described in the applications hereinabove referred to and the valve assembly is placed on the top of the cement and the mud fluid pumped on the valve assembly and the cement until all of the cement has passed below the valve seat 2 and out through the cement discharge means located just below the same. The valve member 3 then seats against the seat 2 to prevent the cement from being pumped beyond the point of discharge and to cause the pump to stall to advise the operator that the cementation has been completed. If some obstruction on the seat 2 should prevent the seating of the valve member 3 the resultant flow that occurs and the displacement of all of the cement below the valve seat 2 will cause the auxiliary movable valve member 5 to move down to the dotted line position shown in Figure 2 and to engage the seat at points spaced from the valve 3, thereby providing for the desirable seal which the valve 3 has failed to affect.

I claim:—

1. A cementing device for use with well casings having a single valve seat therein adjacent the point of discharge of the cement and comprising a valve assembly having a main valve member co-operable with the valve seat, a stem connected to the main valve member, an auxiliary valve member mounted for free movement on the stem, means for preventing displacement of the auxiliary valve member from the stem, said auxiliary valve member being in the form of an in-

verted cup, said valve assembly as a whole being lighter than cement but heavier than the mud fluid.

2. A cementing device for use with well casings having a single valve seat therein adjacent the point of discharge of the cement and comprising a valve assembly having a main valve member co-operable with the valve seat, a stem connected to said main valve member, an auxiliary valve member mounted for free sliding movement on the stem, means for preventing displacement of the auxiliary valve member from the stem, said auxiliary valve member being lighter than cement, said main valve member being heavier than cement, said valve assembly as a whole being lighter than cement but heavier than the mud fluid.

3. A cementing device for use with well

casings having a valve seat therein adjacent the point of discharge of the cement and comprising a valve assembly having a main valve member co-operable with the valve seat, a stem connected to said main valve member, an auxiliary valve member mounted for free sliding movement on the stem, means for preventing displacement of the auxiliary valve member from the stem, said auxiliary valve member being lighter than cement, said main valve member being heavier than cement, said valve assembly as a whole being lighter than cement but heavier than the mud fluid, said auxiliary valve member being in the form of an inverted cup and having a flanged opening provided with beveled portions at its ends, the flanged opening receiving the stem.

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