W. J. LILLY.

PUMP PLUNGER.

APPLICATION FILED AUG. 5, 1915.

1,204,889. Patented Nov. 14, 1916.

Fig. 1,

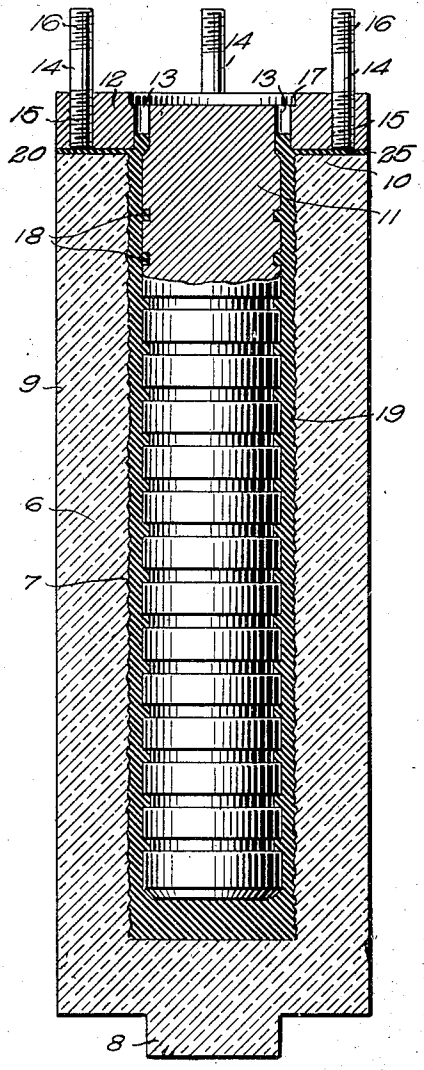


Fig. 2,

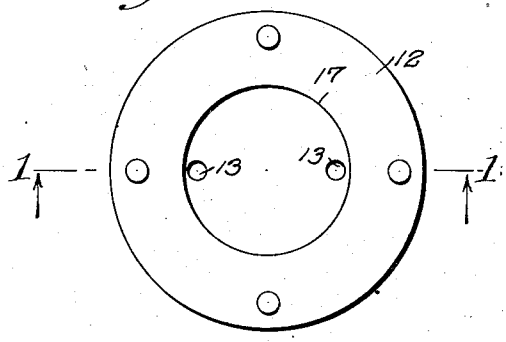


Fig. 3,

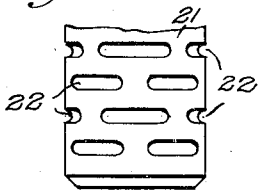


Fig. 4,

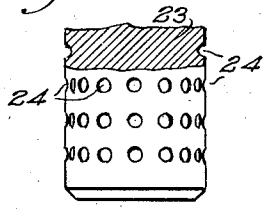
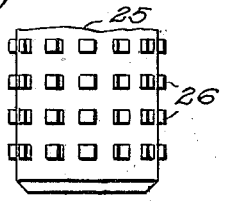


Fig. 5.



WITNESSES

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PUMP-PLUNGER.

1,204,889. Specification of Letters Patent. Patented Nov. 14, 1916.

Application filed August 5, 1915. Serial No. 43,798.

To all whom it may concern:

Be it known that I, WILLIAM J. LILLY, a subject of the King of Great Britain, and a resident of Butte, in the county of Silver-bow and State of Montana, have invented a new and Improved Pump-Plunger, of which the following is a full, clear, and exact description.

My invention relates to pump plungers for general use and is particularly adapted for pump plungers employed in mines for the purpose of removing mine water and other liquids containing acids.

More particularly stated, I seek to provide a pump plunger consisting mainly of acid-proof material so arranged as to be effective in all respects required by a pump plunger and yet possessing great strength coupled with simplicity—the external portion of the pump plunger being not only very smooth but impervious to the corrosive action of acids and the like with which the water to be pumped may be impregnated.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, and in which like characters indicate like parts.

Figure 1 is a section on the line 1—1 of Fig. 2, looking in the direction of the arrows, and shows my improved pump plunger; Fig. 2 is a plan view of the pump plunger shown in Fig. 1; Fig. 3 is a detail view showing in elevation a portion of a metallic core forming a part of my device and differing from the form of core shown in Fig. 1; Fig. 4 is a detail view showing, partly in section and partly in elevation, another form of core, used for substantially the same purpose as the forms shown in Figs. 1 and 3; and Fig. 5 is a fragmentary elevation showing still another form of core, used for the purpose above indicated.

A body member 6 having the form of a hollow cylinder is made, in this instance, of porcelain, though it may sometimes be made of glass, china, stone or any other substance acted upon but slightly, if at all, by the acids contained in water. The body member 6 is provided with an inner face 7 which is roughened. If the body member be made of porcelain it may be roughened by forming its inner face of crushed porcelain and casting the rest of the body member around this portion. The body member is provided at one of its ends with a projection 8. This projection is merely for the purpose of enabling the body member to be handled readily for purposes of grinding its surface.

The external round surface 9 and the upper end 10 of the body member 6 are ground. I provide a metallic core 11 having an annular flange 12 integral with it, these parts thus constituting a single member. This member is provided with holes 13; in this instance, two in number.

I provide a number of bolts 14 each having threaded portions 15, 16, and connect these bolts with the flange 12 by inserting the threaded portions 15 in holes which are drilled in the flange 12 and threaded. A recess 17 is provided for accommodating a projection usually found on the end of a crosshead. The core 11 is provided with a number of grooves 18. A quantity of plastic material 19 capable of hardening and setting is poured through the holes 13 so as to fill the grooves 18 and the space between the core 11 and the inner face of the body member 6. The material used for this purpose may be sulfur heated to a molten state, or it may be any suitable kind of cement capable of setting. The material 19 thus holds the core 11 rigid relatively to the body member 6. A small portion 20 of the plastic material may creep out between the ground end 10 and the adjacent flange 12, as shown at 20 in Fig. 1.

In some instances the core is given the form shown at 21 in Fig. 3; that is, it is provided with slots 22 each of arcuate form, as shown.

Sometimes it is desirable to give the core the form indicated at 23 in Fig. 4. In this instance, it is provided with shallow holes 24 extending radially inward.

If desired, the core may receive the form shown at 25 in Fig. 5. It is here provided with bosses 26 extending radially outward.

When the core has either form shown in Figs. 3, 4 or 5, it is very easily anchored by the plastic material 19.

Instead of using the bolts 14 any other appropriate means may be employed for connecting the plunger to the crosshead of the pump.

I do not limit myself to the precise construction shown as variations may be made therefrom without departing from the spirit of my invention, neither do I limit myself in all instances to any particular ma-

terial to be employed though I find that vitreous material is especially adapted for the body member 6.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A pump plunger comprising a body member made of acid proof material, a core extending into the said body member and spaced therefrom, and a plastic material capable of hardening and located in the space between the core, and the body member, the said core having a flange at its top and openings leading to the said space, for the admission of the plastic material.

2. A pump plunger comprising a body member having the form of a cylinder and made of acid proof material, a core extending into the said cylinder and spaced from the inner surface thereof, the core having an integral flange at its upper end extending over the top of the body member, the top of the core and flange having a circular recess formed therein, and openings leading from the bottom of the recess to the space between the core and body member, and binding material filling the said space and engaging the body member and the core, the said binding material being admitted through the said openings.

3. A pump plunger, comprising a body member having the general form of a cylinder and provided externally and at the upper end with a ground surface and internally with a roughened surface, said body member being made of porcelain, a metallic core extending into said body member and provided with anchorages, and a binding material located within said body member and engaging the inner surface thereof and also engaging said core, said core being further provided at its upper end with an annular flange and with a recess, the core having holes leading from the recess for admitting said binding material.

4. A pump plunger comprising a body member having the form of a cylinder and made of vitreous acid-proof material, the outer surface of said member being ground and the inner surface being roughened, a metallic core extending into the said cylinder and spaced from the inner surface thereof, the said core having an integral flange extending over the top of the body member, means secured to the flange for connecting the plunger to the cross head of a pump, the said core having grooves formed therein, a binding material within said body member and engaging the roughened inner surface thereof and the grooves of said core to hold the core rigid relatively to the body member, the said core having a recess in its top and holes leading from said recess to admit the binding material to the space between the body member and the core.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM JAMES LILLY.

Witnesses:

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