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TOOL FOR PERFORATING WELLS

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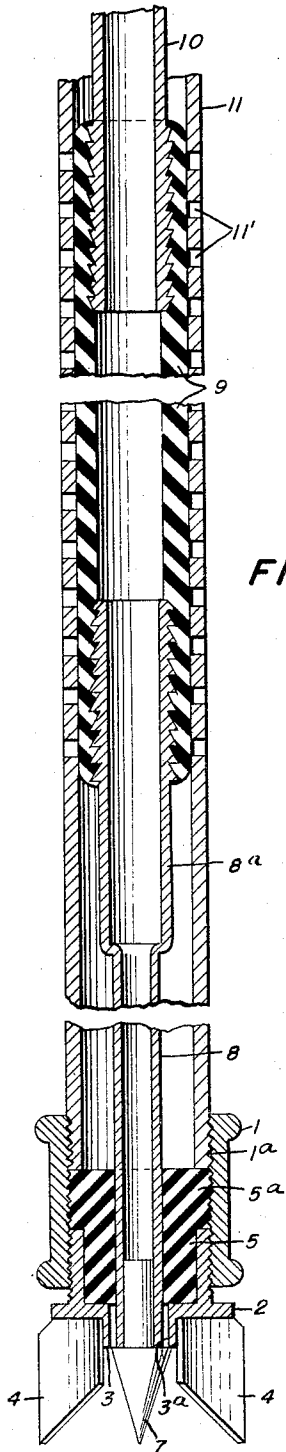


FIG. 1

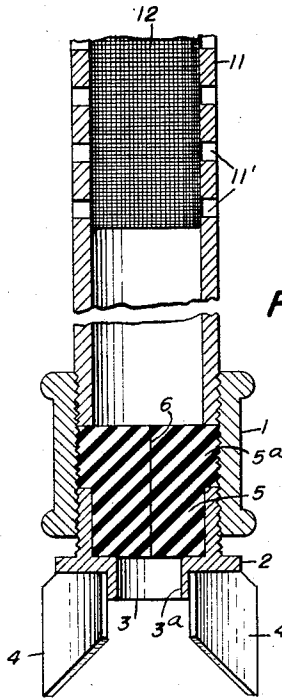


FIG. 2

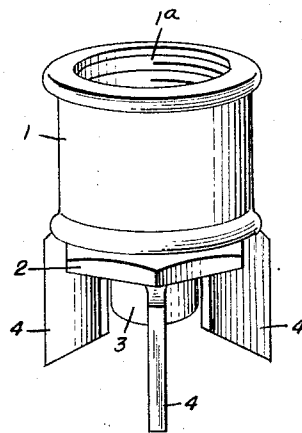


FIG. 3

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5 Claims. (Cl. 166—205)

The present invention relates to well forming equipment and more particularly to means cooperable with the filter positioned in the drilled hole or perforation in the ground serving to prevent sand or other foreign matter passing into the water conduit directly thus impairing the pump and the water installations above the ground and clogging or otherwise adversely affecting the filter.

It has always been a problem with the conventional means used for filtering, when such means have been inserted in the hole to prevent foreign matter from fouling the interstices and metallic cloth forming the filter as soon as the filtering means has been positioned. Hence, the salient object of this invention is the provision of a simple and efficient tool means carried by the lower end of the conduit in which the filter is located, which means assists in locating the filter in the hole and when the filter is in proper position positively prevents the admittance of water or foreign matter into the conduit without first passing through the filter.

Various other objects and advantages of the invention will become readily apparent to one skilled in the art from a consideration of the ensuing detailed description and attached drawings.

In order that this invention may be fully understood reference will now be made to the drawings, in which:

Fig. 1 is a longitudinal cross-sectional view of the invention in its working position.

Fig. 2 is a view generally similar to Fig. 1 showing how the resilient stopper or plug shuts automatically after the water injection tube has been withdrawn, and

Fig. 3 is a view in perspective of the tool means forming the subject of the invention.

It is to be borne in mind that after the hole has been formed in any fashion currently used in the art and the sand layer, or the location at which the filter has been reached, the present invention is brought into operation.

More specifically, it will be seen in Fig. 3 that 1 denotes a cylindrical sleeve member located at the lower end of a filter conduit, to later be more fully described and the bore of the sleeve member is threaded throughout a major portion of its length as at 1a. A cup-shaped cap 2 is positioned in the lower part of the bore of the sleeve member 1 and the side wall of the cap is secured within the bore by suitable means, such as soldering, threading or the like. The outer wall of the cap is provided with a centrally located projection 3 having an aperture 3a therein, and a plurality of cutting blades 4 extend perpendicularly from the outer wall at equally spaced intervals, with such blades serving as a means allowing the assembly to penetrate the sand more easily.

A plug or stopper 5 of rubber or similar material is lodged within the bore of the sleeve member above the cap 2 and the upper end of the plug is flanged as at 5a with the flange seated on the upper end of the side wall of the cap 2. The lower end of the plug is planar and contacts the inner face of the outer wall of the cap. The plug 5 is formed with a slit or restricted orifice 6 which

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extends throughout the longitudinal axis of the plug and normally such slit is closed as shown in Fig. 2.

To form the slit 6, a punch 7 is fitted into the lower open end of a pipe 8 having a portion 8a of larger diameter and the pipe 8 is employed to conduct water exteriorly of the sleeve member 1 during the positioning of the filter.

Secured to the upper end of the portion 8a of the pipe 8 by suitable means is a rubber conduit 9 and a water pipe 10 is affixed within the upper end of the conduit 9 and the pipes 8 and 10 are of the same diameter.

A metal conduit 11 surrounds the pipes 8 and 10 and the conduit 9 and the lower end of the conduit 11 is threaded to engage the threads 1a of the sleeve member 1 so that the member 1 can, together with the components 8, 9 and 10 be secured to the conduit 11. Also, it will be noted that the wall of the conduit 11 is provided with apertures 11' to define the filter, and, if necessary, the apertures can be covered interiorly or exteriorly with a metal cloth 12 as can be seen in Fig. 2.

Furthermore, in Fig. 1, it will be observed that the length of the rubber conduit 9 is such that the apertured area 11' of the conduit 11 is positioned opposite the conduit so that when water is admitted into the pipe 10, the water pressure expands the same thereby closing the apertures 11'.

In the use of the invention, and assuming the hole has been drilled to the proper depth, the pipe 8 with the punch 7 attached thereto is forced through the plug 5 to form the slit 6 therein and position the lower end of the pipe 8 in the bore of the projection of the cap 2 as shown in Fig. 1. The punch 7 is then withdrawn from the pipe 8 so that a passageway extends below the outer wall of the cap 2.

The rubber conduit 9 is then secured to the pipes 8 and 10 and the conduit 11 secured to the sleeve member 1. The assemblage is now ready for introduction into the hole by the use of conventional equipment. As the sleeve member is operating in the sandy zone, water is admitted into the pipe 10 for exit through the lower end of the pipe 8 thereby enabling the blades 4 to penetrate more easily the sand and the closing of the apertures 11' by the conduit 9 permits any water entering the well to facilitate the operation of the sleeve 1 without damaging the filter area 11'.

After the filter has been positioned in its proper location, the pipe 10, conduit 9 and pipe 8 are withdrawn from the conduit 11 and when the pipe 8 leaves the plug 5, the elasticity of the plug material closes the orifice 6 as is illustrated in Fig. 2 so that no foreign matter or the like can enter the conduit and the water must gain access to the interior of the conduit through the filter 11'.

It will be appreciated from the foregoing description that the present invention includes but few cardinal working parts and is positive and efficient in operation. The unit can be readied for use and it is unnecessary to employ highly skilled personnel for its installation. The tool can be easily and inexpensively manufactured and the cost of proper maintenance is negligible.

Furthermore, it is to be understood that the invention is not to be confined to any strict conformity with the showings in the drawings and modifications and alterations may be made therein provided the same marks no material departure from the spirit and scope of the appended claims.

I claim exclusive right on:

1. In a filter assemblage adapted to be positioned in a well hole, a conduit having an apertured area intermediate the ends thereof defining a filter zone, a sleeve secured to one end of the conduit, a resilient plug within the sleeve below the conduit and having a restricted orifice extending throughout the length thereof, cutting blades

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on and depending from the sleeve enabling the sleeve to penetrate the soil, and a water pipe within and extending longitudinally of the conduit with the lower end thereof mounted in the restricted orifice so that when water is introduced into the pipe, the water is directed below the sleeve to facilitate the penetration of the blades and upon the withdrawal of the water pipe from the conduit when the conduit is in place, the removal of the lower end of the pipe from the restricted orifice causes the resilient material of the plug to close the restricted orifice so that water and foreign matter cannot enter the end of the conduit through the plug but must pass through said apertured area of the conduit.

2. A filter assemblage as claimed in claim 1 wherein the lower end of the sleeve is closed by a cap with the plug being positioned between the cap and the end of the conduit and the cutting blades being carried by the cap.

3. A filter assemblage as claimed in claim 2 wherein said cap is provided with a projection having a bore therein in alignment with the restricted orifice of the

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plug and the lower end of the water pipe is positioned in the bore of the projection when such pipe has been mounted in the orifice of the plug.

4. A filter assemblage as claimed in claim 1 wherein said water pipe includes a resilient section of a length substantially corresponding to the length of the apertured area of the conduit and having an outer diameter approximately the inner diameter of the apertured area serving to close the apertured area during the passage of water through the water pipe.

5. A filter assemblage as claimed in claim 4 wherein one face of the apertured area is covered by a metallic cloth.

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