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T. F. MOORE

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WELL POINT

Filed Sept. 29, 1925

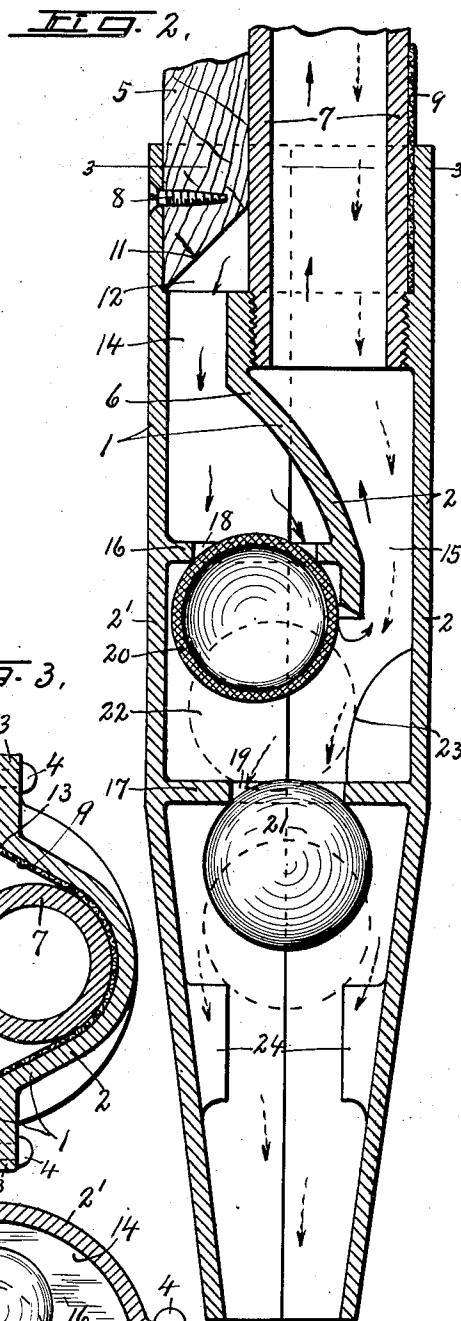
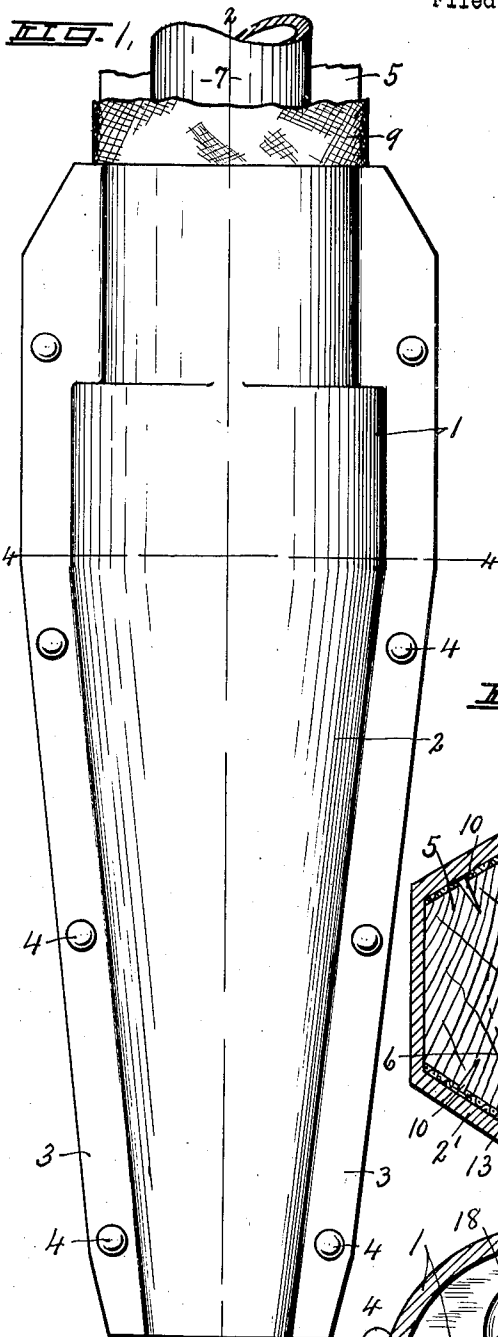


FIG. 3.

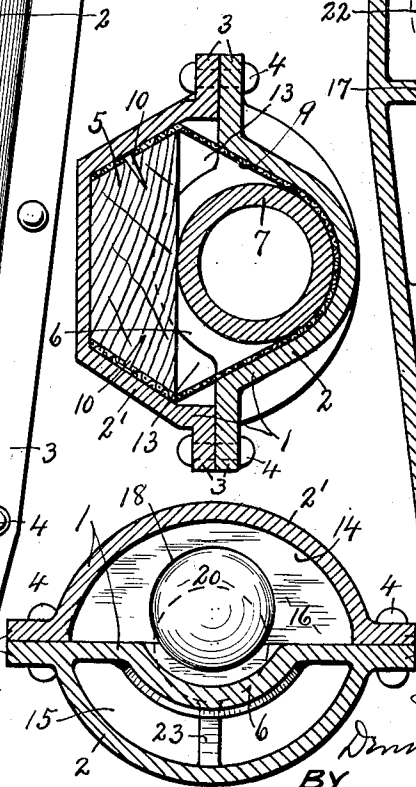


FIG. 4.

WITNESS
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WELL POINT.

Application filed September 29, 1925. Serial No. 59,318.

This invention relates to a well point of the class set forth in my application Serial No. 754,617, filed December 8, 1924, and formally allowed under date of July 6, 1925, for removing seepage water from trenches and other excavations or depressions as may be required for the laying of sewer pipes, water mains and other sub-way conduits or for the erection of foundations for various super-structures.

In the use of a device of this character preparatory to the excavations it is necessary to make a hole in the ground of sufficient size to permit the well point to be inserted to the proper depth.

This may be accomplished by projecting a jet of water under high pressure into the ground where the well point is to be inserted and when the hole is made to the desired depth withdrawing the jet nozzle and then inserting the well point into the hole thus formed and connecting the pipe extension of the well point to a suitable suction device for withdrawing the water which may seep into the hole until the surrounding ground is sufficiently dehydrated to permit the necessary excavations and constructive work therein.

The main object of the present invention is to permit the well point and its extension pipe to be used for the double purpose of projecting a jet of water under pressure into the ground for forming a hole, inserting the well point into the hole as it is being formed by the projection of water there-through under pressure and when projected to the desired depth using the same well point and its extension pipe for withdrawing the water from the hole and the surrounding ground until it is sufficiently dry to permit excavation and constructive work therein.

Another object is to construct the well point in such manner that it may be used for jetting water through dry sand or other soil which tends to absorb the projected jet of water for making a hole of sufficient depth therein to receive the well point in addition to its other function of withdrawing the moisture from the soil as the excavation and constructive work progresses.

Other objects and uses relating to specific parts of the device will be brought out in the following description.

In the drawings:

Figure 1 is a side elevation of a well point

embodying the various features of my invention.

Figure 2 is a longitudinal vertical sectional view of the same device taken on lines 2—2, Figure 1.

Figures 3 and 4 are transverse sectional views taken respectively in the planes of lines 3—3, Figure 2, and lines 4—4, Figure 1.

As illustrated, this well point comprises a hollow upright shell —1— of cast iron or other suitable metal which is mainly oval in cross section and is divided through its longer diameter to form opposed sections —2— and —2'— having outwardly projecting flanges —3— along their meeting edges clamped together by rivets —4— or equivalent fastening means.

The lower end of the shell —1— is tapered to form a nozzle through which water under pressure may be projected under sufficient pressure to form a hole in the ground when the nozzle is applied thereto and thus permitting the shell to be readily sunk into said hole as it is deepened by the continuous jetting of the water therein.

The upper end of the section —2'— is preferably made in the form of a half hexagon for receiving one side and the opposite edges of a screen supporting strip —5— of wood or equivalent material, the inner face of said strip being substantially flat while the strip as a whole is shown as located wholly at one side of the meeting edges of the sections —2— and —2'— shown in Figure 2.

The upper end of the section —2— is somewhat semi-circular in cross section and just below this semi-circular portion is provided with a hollow bracket —6— projecting inwardly from the outer wall thereof and preferably integral therewith for receiving the lower end of an upright pipe —7— which together with the wooden strip —5— extends any suitable height above the upper end of the shell —1— according to the depth to which it may be desired to insert the well point in the ground, it being understood that these extensions —5— and —7— may be continued indefinitely as may be necessary for different conditions of the ground or for varying depths of the constructive work.

The lower end of the pipe —7— is preferably threaded externally and engaged with internally threaded walls in the upper end

of the hollow bracket —6— as shown in Figure 2 for holding the hollow section —1— and pipe in fixed relation against relative endwise or lateral movement.

5 The lower end of the wooden strip —5— is firmly secured to and within the upper end of the shell —1— by screws —8— or equivalent fastening means for holding those parts in fixed relation against relative
10 endwise or lateral movement.

The inner flat face of the wooden strip —5— and adjacent side of the pipe —7— preferably abut against each other to act as mutual reinforcements. The wooden strip
15 —5— is of somewhat greater width transversely than the diameter of the pipe —7— so as to extend equal distances beyond its line of contact with the adjacent side of the pipe and thereby to form intervening
20 spaces between said line of contact and the side walls of the shell —1—.

When the wooden strip —5— and pipe —7— are brought into the relation just described they are bound together by a screen
25 —9— of burlaps or other water pervious material extending from end to end of the wooden strip —5— and also a part of the length of the pipe —7— except where said pipe is threaded into the upper end of the
30 hollow bracket —6— as shown in Figure 2, said screen having its ends secured to the opposite upright edges of the wooden strip —5— by means of nails —10— or other suitable fastening means so that when the
35 wooden strip —5— and pipe —7— are assembled in the shell —1—, the lower edges of the screen —9— will be impinged between the opposite upright beveled edges of the strip —5— and adjacent sides of the
40 shell section —2'— while the lower end of the intermediate portion of said strip will be similarly impinged between the outer side of the adjacent portion of the pipe —7— and contiguous wall of the shell section
45 —2— as shown more clearly in Figure 3.

The upper end of the hollow bracket —6— terminates a sufficient distance below the upper end of the shell —1— to permit proper insertion and securement of the lower
50 end of the wooden strip —5— within the upper end of said shell, said strip having its lower edge —11— beveled upwardly and inwardly from its outer face to form a water passage —12— communicating with
55 the spaces between opposite sides of the pipe —7— and adjacent walls of the shell —1—.

When the fabric screen —9— is wrapped around the pipe —7— and edges of the wooden strip —5— the opposite sides there-
60 of extend from the outer face of the pipe toward the strip in transversely diverging planes so as to form vertical passages —13— communicating at their lower ends with the passage —12— for a purpose hereinafter
65 described.

The upper end of the hollow bracket —6— projects beyond the meeting faces of the sections —2— and —2'— but in spaced relation to the outer wall of the section
70 —2'— to form an intervening passage —14— communicating with the lower end of the passage —12—, the remaining portion of the inner wall of the bracket being inclined downwardly and outwardly and is spaced apart from the outer wall of the
75 section —2— to form an intervening passage —15— which communicates at its upper end with the lower end of the pipe —7—, Figure 2.

The intermediate portion of the shell
80 —1— is provided with vertically spaced horizontal partitions —16— and —17— having ports or openings —18— and —19— therethrough respectively controlled by float
85 valves —20— and —21—.

The partition —16— is located some distance below the lower end of the wooden strip —5— and slightly above the lower end of the bracket —6— and is formed partly
90 on each of the sections —2— and —2'— at opposite sides of the longitudinal division between said sections and thereby forms the lower wall of the chamber —14—.

The partition —17— is also partly on each of the sections —2— and 2'— at op-
95 posite sides of the meeting faces of said sections and some distance below the partition —16— to form therewith an intervening valve chamber —22— which communi-
100 cates with the lower end of the passage —15— at one side of the valve opening —18— and also communicates with both of the valve openings —18— and —19— when the ball valves —20— and —21— are
105 opened.

The valve —20— is of greater diameter than the opening —18— and is adapted to seat against the underside of the walls of said opening when closed by the upward
110 pressure of water accumulating in the shell —1— but in the absence of such pressure may fall by its own weight upon the partition —17— but when opened is prevented from closing the opening —19— by a pro-
115 jection —23— on the interior of the shell section —2—.

In like manner the ball valve —21— in the lower valve-chamber is of greater diam-
120 eter than its opening —19— and is adapted to seat from the underside against the walls of said opening when buoyed upwardly by water pressure in the shell —1— but in the absence of such pressure may drop by its own weight from its seat against suitable
125 underlying shoulders —24— projecting inwardly from the walls of the shell —1— some distance below the valve when closed as shown in Figure 2.

The lower end of the inside wall of the hollow bracket —6— extends a sufficient
130

distance below the partition —16— to co-operate with the opposite wall of the shell section —2'— in forming a guide for the ball valve —20— and is also spaced apart 5 from the shoulder —23— a less distance than the diameter of the ball to prevent the entrance of the ball into the passage —15— and to assure the closing of the valve by water pressure from below.

10 As previously stated this device may be used for projecting a jet of water under pressure into the ground to form a hole of sufficient size to permit it to be readily inserted thereto to any depth desired and 15 when inserted to the proper depth the water under pressure may be shut off and the device connected to a suction pump or equivalent mechanism for withdrawing the water from the hole and from the soil surrounding the same.

For example, in case the condition of the soil is such as to prevent the easy entrance of the well point thereto the lower end of the well point will be placed with its nozzle 25 against the ground at the place where it is to enter and the upper end of the pipe —7— will be connected to a source of water supply under pressure allowing the water to pass downwardly through the pipe and thence 30 through the passage —15— into the chamber —22— thereby closing the valve —20— against its seat in the partition —16— and opening the valve —21— to allow the water to pass downwardly through the lower end or nozzle of the well point to displace the 35 underlying soil and thus permit the device to gradually sink into the hole, this operation being continued until the lower end or some portion of the screen —9— is brought 40 to or below the level of the water seepage at which time the water pressure will be shut off from the pipe —7— and the latter will be connected to a suction pump or equivalent device for withdrawing the water 45 which may pass through the screen into the shell —1—.

That is, when the device has been sunk to the desired depth the seepage water will pass through the screen —9— and thence thru 50 the passages —13— and —12— into the chamber —14— while the suction produced in the pipe —7— and passage —15— communicating therewith and with the chamber —22— will cause the valve —20— to open 55 and allow the seepage water in the chamber —14— to be withdrawn through the opening —18— and thence through the chamber —22— and passage —15— and out through the pipe —7— to the suction pump 60 where it is discharged some distance remote from the place of entrance of the well point into the ground.

During this operation of withdrawing the screened water by suction from the shell

—1— the valve —21— will be closed against 65 its seat in the partition —17— to prevent the entrance of sand and other foreign matter into the chamber —22— thereby assuring the free operation of the pump in withdrawing the water from the surrounding 70 ground exclusive of any foreign matter which might interfere with the free operation of the device.

It will be noted that the cross sectional form of the bracket —6— gradually changes 75 from a circular form at the top for receiving a pipe to a relatively narrow but crescent shaped form at the bottom but of substantially the same cross sectional area so as to maintain a free flow of the water 80 therethrough and at the same time affords a sufficient space for the operation of the valve 20 without in any way enlarging or altering the external diameter of the shell —1—.

What I claim is:

1. In a device for draining water-containing soil, a shell adapted to be inserted into the soil and provided with a main passage therethrough from end to end for receiving water under pressure and a branch 90 passage leading from the main passage through the upper end of the shell for receiving seepage water from the soil, and a valve controlling the seepage passage. 95

2. In a device for draining water-containing soil, a shell adapted to be inserted into the soil and having its upper end provided with a screened inlet passage and an outlet passage, said outlet passage being adapted to be connected to a means for producing suction therein, said inlet passage and outlet passage being connected to each other through a port, and a valve adapted to be operated by the entrance of 105 water into the shell to close said port and to automatically open when suction is applied to the outlet to permit the seepage water within the shell to be drawn from the inlet into the outlet. 110

3. In a device of the character described, a shell adapted to be inserted into the soil and provided with valve-chambers at different levels connected by a port, the upper valve chamber having separate passages 115 leading therefrom through the upper end of the shell, the lower valve chamber having an inlet passage in its upper end and an unobstructed outlet passage in its lower end and a float valve controlling said port. 120

4. In a device of the character described, a shell adapted to be inserted into the soil and provided with separate valve chambers at different levels, the upper valve chamber having separate passages leading therefrom through the upper end of the shell 125 and connected by a port, a float valve controlling said port, the lower valve-chamber

having an outlet in its lower end connected by a port to the upper valve chamber, and a valve controlling the last-named port.

5 5. In a device of the character described, a shell having valve chambers at different levels connected to each other through a port, the lower valve chamber having an outlet in its lower end, the upper valve chamber having separate branch passages
10 leading therefrom through the upper end of the shell, a float valve controlling said port and adapted to be closed by the rise of water in the shell, a separate float valve controlling one of said branch passages
15 and adapted to be closed by the rise of water in the shell, the other branch passage being adapted to be connected to a source of water supply under pressure for opening the first-named valve and permitting the
20 passage of water through the outlet into the soil to make a hole therein for the reception of the shell and to simultaneously close the second-named valve, said other branch passage being also adapted to be
25 connected to a means for producing suction therein for closing the first-named valve and opening the second-named valve to allow the seepage water accumulating in the shell to be withdrawn from the first-named branch

passage into the upper valve chamber and 30 thence outwardly through the second-named branch passage.

6. In a device of the character described, a shell adapted to be inserted in the soil and provided with valve chambers connected 35 by a port, one of said valve chambers having an outlet leading therefrom through the lower end of the shell, the other valve chamber having separate branch passages leading therefrom through the upper end 40 of the shell, and separate float valves for said port and one of said branch passages respectively.

7. In a device of the character described, a shell adapted to be inserted in the soil 45 and provided with valve chambers connected by a port, one of said valve chambers having an outlet leading therefrom through the lower end of the shell, the other valve chamber having separate branch passages 50 leading therefrom through the upper end of the shell, separate float valves for said port and one of the branch passages respectively, and a screen covering one of said branch passages. 55

In witness whereof I have hereunto set my hand this 21st day of September 1925.

THOMAS F. MOORE.