

(No Model.)

J. B. EDSON.

FORMATION OF DEEP WELLS AND APPARATUS THEREFOR.

No. 288,557.

Patented Nov. 13, 1883.

Fig. 1.

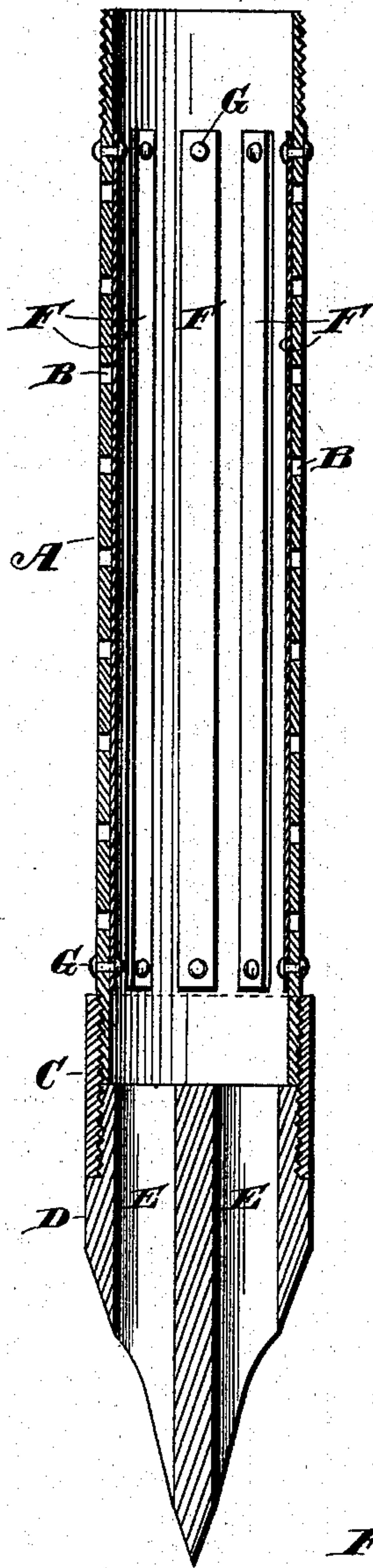


Fig. 2.

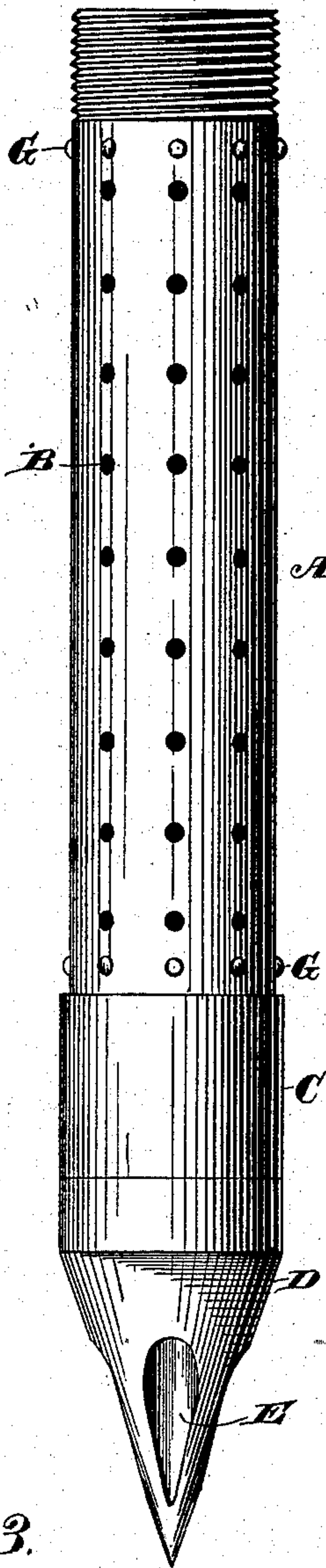
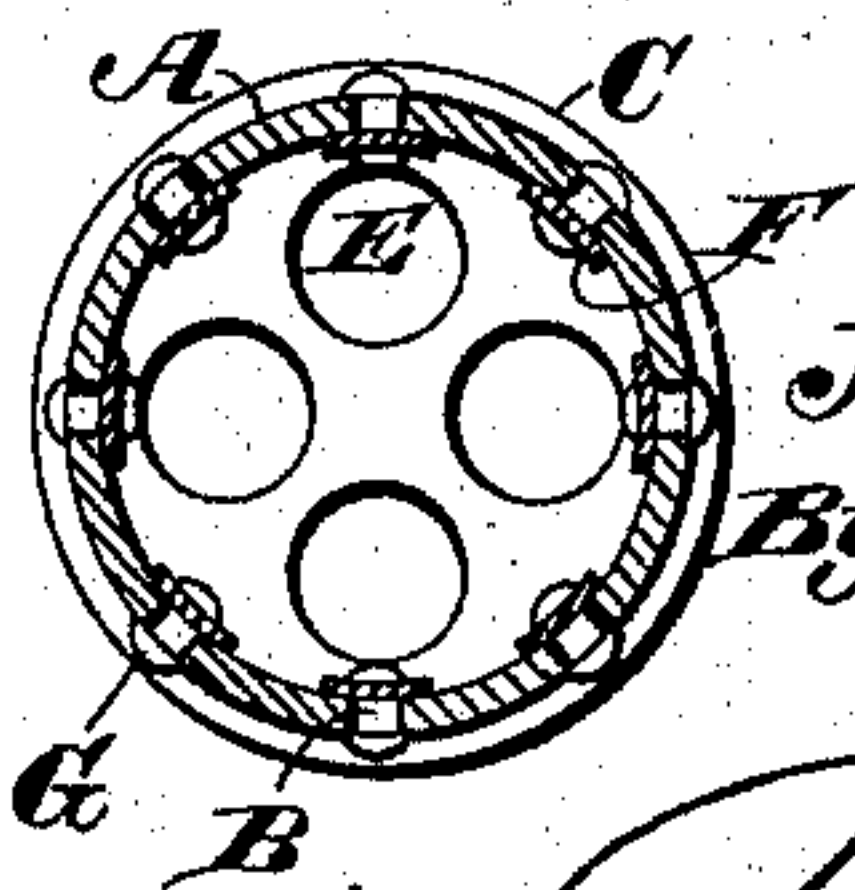


Fig. 3.



Witnesses.

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FORMATION OF DEEP WELLS AND APPARATUS THEREFOR.

SPECIFICATION forming part of Letters Patent No. 288,557, dated November 13, 1883.

Application filed September 8, 1883. (No model.)

To all whom it may concern:

Be it known that I, JARVIS B. EDSON, a citizen of the United States, residing at Adams, county of Berkshire, State of Massachusetts, have invented new and useful Improvements in the Formation of Deep Wells in Quicksand, Marl, Clay, &c., and Apparatus Therefor, of which the following is a specification.

This invention relates to that class of improvements in which wells for the purpose of obtaining water are formed through deposits or beds of quicksand, marl, clay, &c., by forcing water through a tube and washing away the material around the lower end of the same, (thereby permitting it to settle down into the hole so formed,) and which tube thus becomes the lining or wall of the well itself after the washing process has ceased, which process is more fully set forth in United States Patent granted me May 15, 1883, and numbered 277,695.

The present invention consists, first, in concentrating the effluent stream at the moment of its leaving the pipe upon the materials to be acted upon by a suitably-constructed point; and, secondly, in providing a suitable end to the well-pipe to facilitate the proper collection and entrance of the water sought when the same is reached.

Referring to the drawings, Figure 1 is a central longitudinal section of the end and point combined. Fig. 2 is an elevation of the end and point shown in Fig. 1. Fig. 3 is a cross-section of Fig. 1, taken in the line 3 3.

In all the figures like letters indicate like parts.

A indicates a short length of pipe threaded at both ends and perforated with holes B B in sufficient quantity and size.

C is a pipe-coupling, into one end of which the pipe A is screwed.

D represents the point, which consists of an upper cylindrical portion having a male thread, by which it is connected with the coupling C, and a lower extremity tapered to a sharp point. Openings E are cut longitudinally in said point, having their openings in the conical or tapered face thereof.

F F represent strips of rubber riveted in position at each end, as shown at G, and serving as valves for closing the holes B.

The operation of the whole will be readily

understood, as follows: In "washing down" a pipe to form a well it frequently becomes necessary to go down a considerable distance—say two hundred feet or more—during which the friction becomes considerable, and the water required for the operation has to be understandingly and oftentimes economically used—that is to say, the whole effect of the descending current of water should be concentrated upon what is immediately in advance of the pipe. To effect this I so perforate the point D with holes E as to deliver the water in advance of the body of the pipe, and generally in advance of the point, depending somewhat upon the speed with which the whole is lowered. In some formations of clay, sand, &c., the pipe has been lowered for short distances five feet per second; but when beds of certain grades of gravel are encountered much slower progress is made, not over a few feet an hour being possible at times, and it is of the utmost advantage when operating in such grades of gravel that the mechanical effect of the water should be produced at the lowest point possible and conjointly with the wedge-like action produced by steadily lowering the pipe-point as fast as admissible. It will be seen, therefore, that the perforated pointed end acts as a twofold way, the water washing away and rendering more buoyant what it can, and the point prying aside what the water has failed in displacing. In fact, where extremely large stones or boulders are encountered, the water is projected against the same and glances off in a right line to that of descent until it has sufficiently removed the adjacent material from the side of the boulder (generally the side which is nearest the point) to form a pocket into which the boulder rolls, allowing the descent of the pipe to continue as before. Of course it is not contended that where bed-rock or nothing but large stones or boulders are met with any progress can be made by this system, as the drilling method would be clearly indicated. The second feature of the invention consists in the peculiar construction of the end A of the pipe, to which the point D is attached. During the washing-down process it is highly important to deliver, without loss of "head," all the water at the point or extreme end, whereas when the desired water-bearing strata has been reached it is equally important

to have provided plenty of inlets for the water so formed other than and in addition to the openings through which water had been expelled during the constructing process. I therefore perforate the lower end of the well-pipe with small holes B B, through which the outside water can enter, but which shall properly retard the gravel and form a filter. These holes are so located as to admit of being easily closed or covered, as in this case, by strips of rubber or other suitable flexible material held, as shown, by rivets at either end, but still not so firmly covered but that a slight pressure from the outside may easily keep the strips off the same and allow the free entrance of the exterior water. In this manner, then, I am enabled to form very cheaply an effective end, practically tight during the construction of the well, but open and perforated as soon as water is reached and the operation of washing down ceases. I have also accomplished the same result by using one pipe sliding freely within the other, having the perforation-holes drilled through both and in line, so as to admit the exterior water when the end or point rested in its final position, but which at other times was so affected by the internal pressure of the water as to cause one pipe to slide upon the other just far enough to close the holes, or, rather, prevent their coinciding, and it is quite obvious that many other methods will readily suggest themselves by which the perforations can be kept closed pending the excess of the interior over the exterior pressure, and not otherwise; but the one shown herewith is the one I have succeeded best with and have found to work satisfactorily.

I do not claim, broadly, a perforated end of the well pipe or tube; nor do I claim such per-

forated pipe in connection with a solid point, as such inventions appear elsewhere.

What I do claim is—

1. In the construction of wells, a point, D, having passages extending through it in the direction of the advance of the point in the earth for the introduction of fluid downward through the point to wash away material at the lower end thereof, and to permit the upward flow through the point of the water stratum when the latter is reached, substantially as described.

2. The point D for a tube-well constructed with a series of longitudinal passages, E, extending in lines parallel to the solid center and axis of the point, substantially as described.

3. The perforated well-pipe end A, provided with the internal valves, F F, for closing said perforations during the construction of the well by the maintenance of an excess of pressure inside, substantially as described.

4. The combination of the perforated pipe A, provided with valves F F, with the point D, drilled in line of its axis, substantially as described.

5. The process of constructing deep wells by washing through a concentrated point attached to a section of perforated pipe provided with suitable valves for preventing the escape of the washing-water, but constructed to admit any exterior water when the washing down has ceased, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JARVIS B. EDSON.

Witnesses:

JAMES L. NORRIS,

JAMES A. RUTHERFORD.