

(No Model.)

J. D. STEPHENSON.  
TOOL FOR SINKING WELLS.

No. 454,082.

Patented June 16, 1891.

Fig. 1.

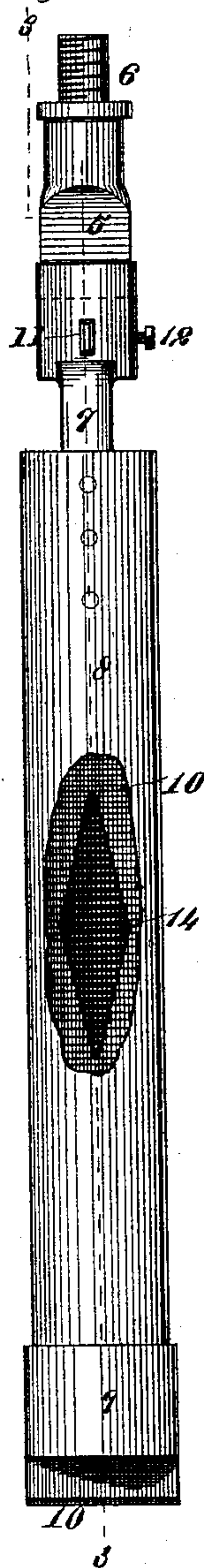


Fig. 2.

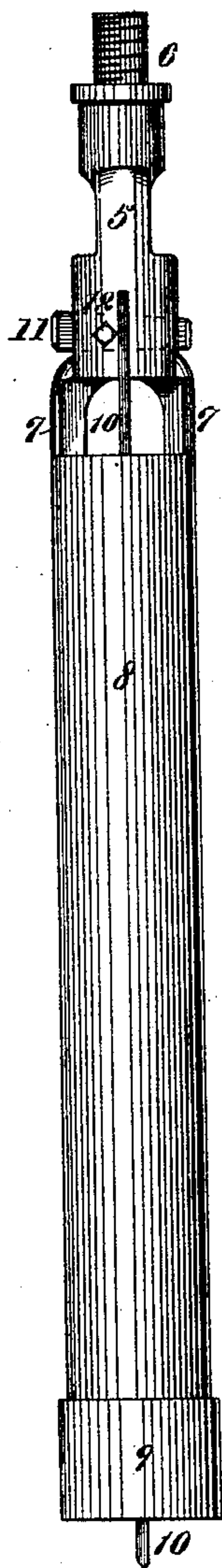


Fig. 3.

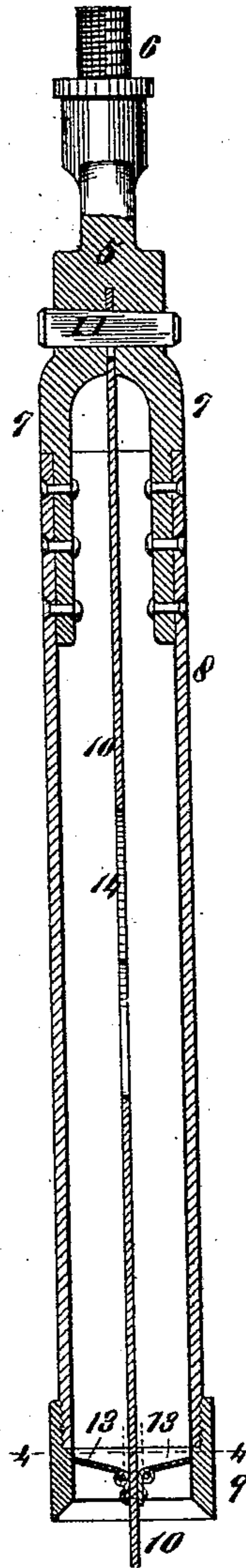
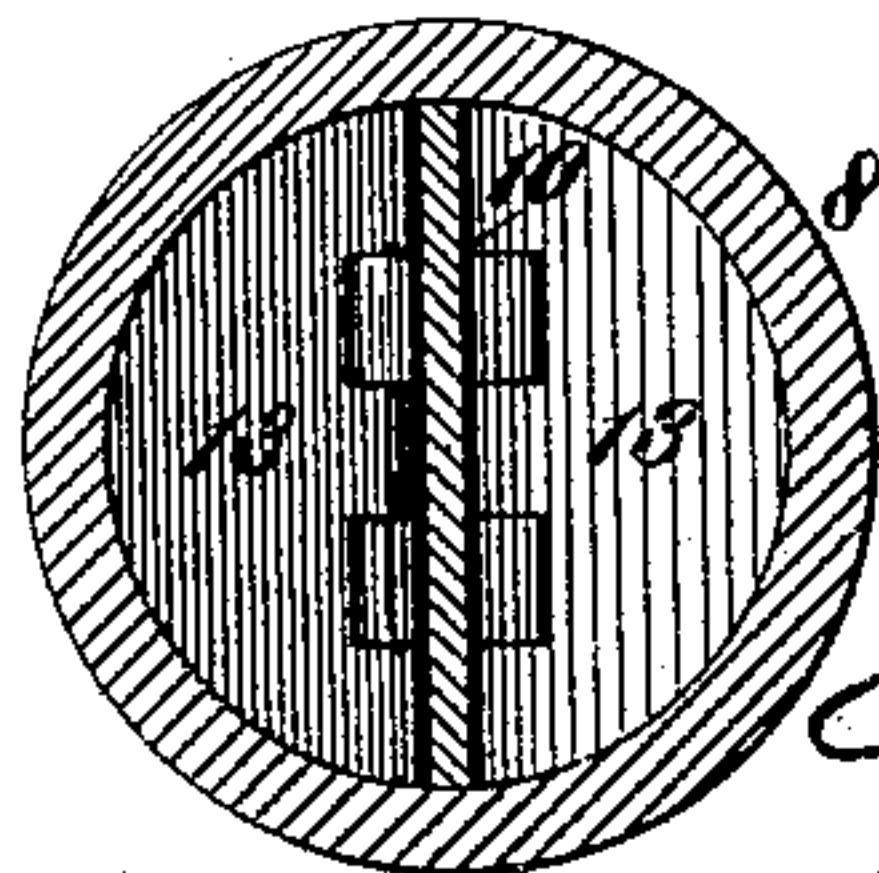


Fig. 4.



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# UNITED STATES PATENT OFFICE.

JAMES D. STEPHENSON, OF BOERNE, TEXAS.

## TOOL FOR SINKING WELLS.

SPECIFICATION forming part of Letters Patent No. 454,082, dated June 16, 1891.

Application filed September 29, 1890. Serial No. 366,439. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES D. STEPHENSON, a citizen of the United States, residing at Boerne, in the county of Kendall and State of Texas, have invented certain new and useful Improvements in Tools for Sinking Wells, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates more particularly to improvements in tools for sinking Artesian wells.

The object of the invention is to construct a tool for such purpose that will perform its duty under all circumstances and excavate as well in hard material as in soft earth, as quicksand and cavey formations, and will not have its functions interfered with when an insufficient flow of water is encountered.

The invention consists of a socket-piece, preferably in the center of which is arranged a diaphragm or central plate carrying at the lower end two hinged valves opening upward, the lower extremity of the central plate or diaphragm forming a chisel or cutting-edge protruding from the end of the tool. The central plate or diaphragm is secured to the tool, so that it can be readily detached, whereby when the tool is lifted to the surface of the ground the excavated material contained therein will readily free itself from the tool.

The invention will best be understood by referring to the accompanying drawings, in which—

Figure 1 is an elevation of a tool made in accordance with my invention, illustrating the same as partly cut away to show the internal arrangement. Fig. 2 is an elevation thereof taken at right angles to the plane of Fig. 1. Fig. 3 is a vertical section through the center of the tool on the line 3 3 of Fig. 1, and Fig. 4 is a horizontal section on the line 4 4 of Fig. 3.

The same figures of reference indicate the same parts throughout the several views.

The tool is made up of a stub 5, which has a screw-thread 6 at its upper part, by which it may be secured to the bit which is flexibly suspended above. To arms 7 7 that depend

from the stub 5 is secured a hollow cylinder 8, at the lower end of which is a cutting ring or annulus 9.

In sinking wells by the dropping method, for which the present tool is adapted, and in strata that could not be penetrated by the ordinary open-sided drop-auger or earth-socket, when an insufficient flow of water is encountered, the contents slip from the tool and thus prevent the well from being excavated. So, also, when alternate layers of slate and clay or other hard and soft formations are encountered, they cause the ordinary open-sided earth-socket to expand and lock in the well. The tool has therefore to be abandoned and more tedious methods resorted to. The object of the present invention is to obviate these difficulties and to construct a tool that will perform the required duty under all the circumstances named. For this purpose I provide the socket 8 with a central diaphragm or plate 10, which is removably held to the stub 5 by a key 11, that passes through perforations in said stub and the upper part of said plate. This key is held in place by a set-screw 12. The lower part of the plate or diaphragm 12 is provided with semicircular hinged valves 13 13, which open upwardly. These valves are adapted to fit snugly the inside of the tool. The hinges of said valves are riveted on the central diaphragm taperingly, so as to offer as little obstruction as possible to the material passing in the tool. The lower end of this central diaphragm is fashioned into a cutting-edge that precedes the annular cutting-edge 9, making a chisel cutting-edge, which acts to penetrate the different strata, so that the annular cutting-edge 9 will more easily perform its work.

The tool is intended to be used by raising it by any suitable machinery and allowing it to fall. The material cut loose by it will, as the tool descends, push the valves 13 upward, which will close as the tool is raised, and will retain the material therein, preventing any flow of water that is encountered from washing said material out of the tool, or causing the contents thereof to slip from it. So, also, when quicksand, mud, or other soft earth is encountered, the valves 13 will allow such material to readily pass into the tool, but



will prevent it from leaving it. As this tool is particularly well adapted for quicksand, mud, and soft earth, it may be called a "sand-pump," "mud-socket," "mud-bit," or improved "earth-socket."

Sometimes more material will accumulate on one side of the diaphragm than on the other, owing to more passing through one of the valves than the other, and to maintain the same quantity of material on each side of the diaphragm I cut said plate away at 14, in order that the spaces on each side of the diaphragm may communicate with each other, and the excess of material on one side pass through said opening to the other side, maintaining the same quantity of material on each side of the tool. After the tool has become full it is drawn out of the well and raised about a foot above the ground, the set-screw is then turned, the key 11 taken out, whereupon the diaphragm carrying the valves drops down and permits the material to fall from the tool. The diaphragm carrying the valves is now slid back to its place, the key 11 inserted to hold it in place and the set-screw 12 screwed down against the key to prevent it from slipping out. I regard one or more valves which accomplish the same function as herein set forth as within the spirit of my invention.

I am aware that tools for boring wells have heretofore been provided with ball and other valves permanently secured in place for preventing the material from leaving the tool after it enters it, and do not wish to be understood as claiming, broadly, herein a valve for such purpose; but in such previous tools the material is discharged at the upper end of the tool, and not at the lower end, where the valves are, which are made removable for this purpose in my device.

What I desire to claim, and secure by Letters Patent of the United States as my invention, is—

1. A tool for sinking Artesian wells, consisting of a hollow socket provided with a cutting-edge, valves at the lower end of said hollow socket for permitting the material to enter the tool, but preventing it from leaving the same except when removed for such purpose, and a valve-carrying support removably secured to the hollow socket for holding said valves in place in said socket.

2. A tool for sinking Artesian wells, consist-

ing of a hollow socket provided with a cutting-edge, a diaphragm removably secured within said socket, and valves carried at the lower end of said diaphragm for allowing the material to enter the tool, but preventing it from leaving the same except when the diaphragm is removed for such purpose.

3. A tool for sinking Artesian wells, consisting of a hollow socket, a diaphragm within said socket removably secured to the same, the lower end forming a cutting-edge or chisel, and valves carried by said diaphragm at the end of said socket for allowing the material to enter the tool, but preventing it from leaving the same except when the diaphragm is removed for such purpose.

4. A tool for sinking Artesian wells, consisting of a hollow socket, a diaphragm within said socket removably secured thereto, the lower end forming a cutting-edge or chisel, an opening in said diaphragm for the purpose described, and valves carried by said diaphragm at the lower end of said socket for allowing the material to enter the tool, but preventing it from leaving the same except when the diaphragm is removed for such purpose.

5. A tool for sinking Artesian wells, consisting of a hollow socket, a diaphragm within said socket removably secured thereto, the lower end forming a cutting-edge or chisel, and hinged valves carried at the lower end of said diaphragm for allowing the material to enter the tool, but preventing it from leaving the same.

6. A tool for sinking Artesian wells, consisting of a hollow socket, a diaphragm within said socket, the lower end forming a cutting-edge or chisel, a key for removably securing said diaphragm to the stub carrying said socket, and hinged valves carried at the lower end of said diaphragm for allowing the material to enter the tool, but preventing it from leaving the same except when the diaphragm is removed.

In testimony whereof I have hereunto set my hand and affixed my seal, this 4th day of September, 1890, in the presence of two subscribing witnesses.

JAMES D. STEPHENSON. [L. S.]

Witnesses:

N. R. MILLER,  
PAT OLIPHANT.