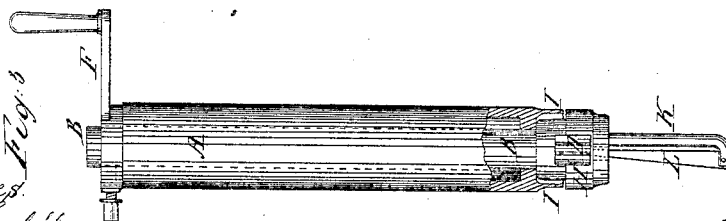
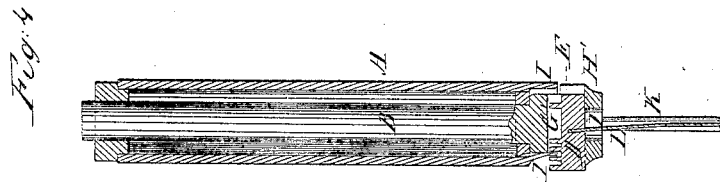
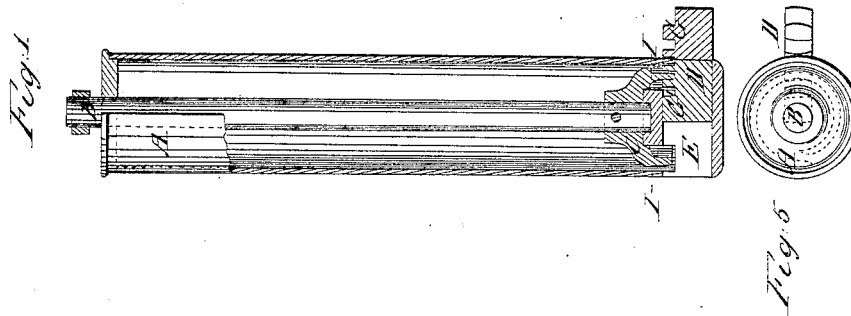
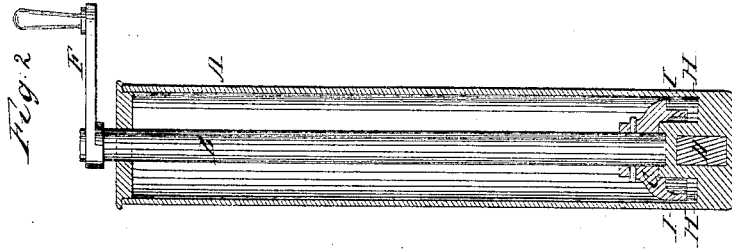


*G. F. Case,*  
*Expanding Rock Drill.*

*No 49,717.*

*Patented Sep. 5, 1865.*



*Witnesses*  
*E. S. Topliff*  
*J. M. Covington*

*Inventor*  
*Geo F. Case*  
*By J. H. Case*

# UNITED STATES PATENT OFFICE.

GEORGE F. CASE, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN EXPANDING DRILLS FOR WELL-BORING.

Specification forming part of Letters Patent No. 49,717, dated September 5, 1865.

*To all whom it may concern:*

Be it known that I, GEORGE F. CASE, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Expanding Drills for Artesian Wells; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents an apparatus or implement made according to my invention, the greater part thereof being shown in section. Fig. 2 is a longitudinal section thereof at right angles to the section in Fig. 1. Fig. 3 represents a modification thereof, partly in section. Fig. 4 is a longitudinal section at right angles to the view given in Fig. 3. Fig. 5 is a plan or top view of Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of this invention is to produce an implement or apparatus by means of which the bottom of an Artesian well or any other part thereof can be chambered out or enlarged in diameter; and it consists in a tube which carries in a diametrical chamber at its lower end a horizontal drill capable of being driven outward beyond the periphery of the tube in order to cut away the sides of the well when the tube which carries it is rotated.

A is a hollow cylinder, closed at the bottom, whose length is to be such as to extend from the surface of the earth down to the place to be chambered out. This cylinder is to be rotated by any suitable means, as by a belt or cog-gearing, or by a crank. Such means are not here shown, because I do not claim any particular manner of applying them. The bottom of the cylinder has a horizontal opening, E, made clear across it on the line of its diameter, to receive a drill or reaming-tool, D, whose upper side has teeth cut thereon, as shown in the drawings. An annular groove, H, is cut in the bottom of the cylinder, in its inside, which intersects the opening E on opposite sides.

B is a central shaft, extending the whole length of the tube A, and fitted on top with a crank, F. Its bottom carries a helix, I, whose outline is seen in dotted outline in Fig. 5, and

which revolves in said groove H, and consequently when in motion engages the teeth on the tool D and causes said tool to protrude beyond the circumference of the tube when the crank is turned in one direction, and to be withdrawn when turned in the opposite direction. The bearing-point of the shaft is in the solid part of the bottom of the cylinder, above the opening E. When the tool D has been protruded beyond the circumference of the tube it is evident that the revolution of the tube will cause the sides of the well to be worn and cut away by the tool. The tube may be nearly equal to the diameter of the well, if such tube is specially provided for the operation described; but the ordinary well-tubing, which is of much less diameter, may be used for this purpose, in which case, in fitting the tool to its bottom, provision should be made not only for strengthening the bottom of such tubing, but also for properly supporting the tool therein. When the tool D has been driven out to its greatest extent the advanced edge of the helix I comes against the broad tooth G' of the tool, and the advance of the tool is stopped. So when it has been withdrawn into the tube the opposite edge of the helix comes against the broad tooth G at the opposite end of the tool, when its return movement ceases.

The modification of my invention shown in Figs. 3 and 4 consists in detaching the bottom of the tube H' from the rest of the tube, and in connecting such bottom to the shaft B, so that they revolve together, and also in forming the helix I, which drives out the tool D, upon the lower edge of the tube. When thus arranged the revolution of the tube causes the protruding end of the tool D to abrade and cut away the sides of the well, as in the plan above described. When the helix has reached the blank space G', where the teeth on the upper side of the tool have been cut out, the advance of the tool ceases, but since, if the tool and the helix were left in the position at which that advance places them, the helix would not be able to return the tool by a revolution in the opposite direction, therefore I have provided a spring, L, whose force is always exerted to carry the tool toward the right, so as to bring its last tooth against the inner side of the helix, whereby the helix is kept in constant engagement with the

teeth of the tool to withdraw or to advance it. The spring is placed on the end of the hanging bracket K, whose end is screwed into the bottom section, H. The free end of the spring enters a recess made for it in the lower side of the tool D, an opening, J, being cut in the bottom part, H, for the spring to play in.

I claim as new and desire to secure by Letters Patent—

1. Enlarging the diameter of the bottom or other part of an Artesian well, substantially as shown.

2. Advancing the tool D in a horizontal direction, substantially as and for the purpose above described.

3. In combination, the tube A, the shaft B, the tool D, toothed as described, and the helix I, substantially as shown.

G. F. CASE.

Witnesses:

S. T. POMEROY,  
M. M. LIVINGSTON.