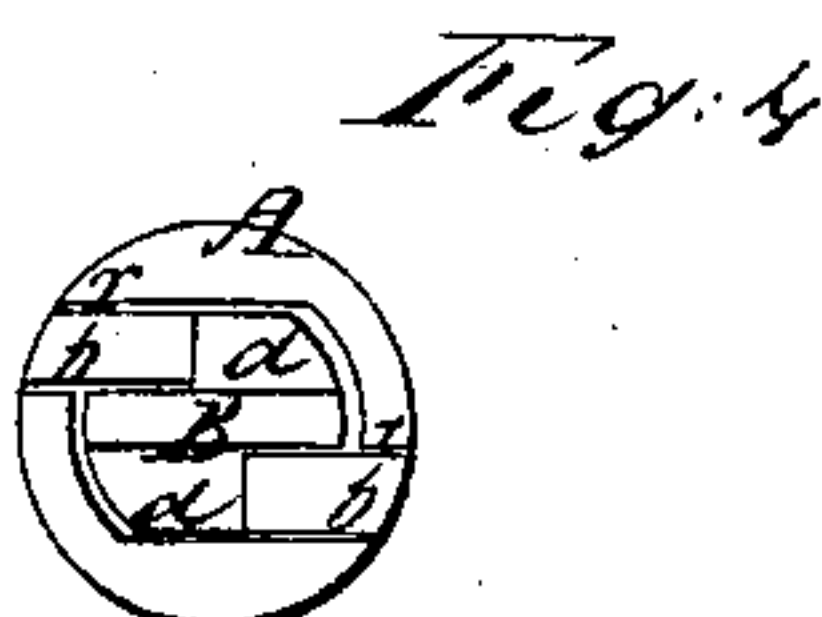
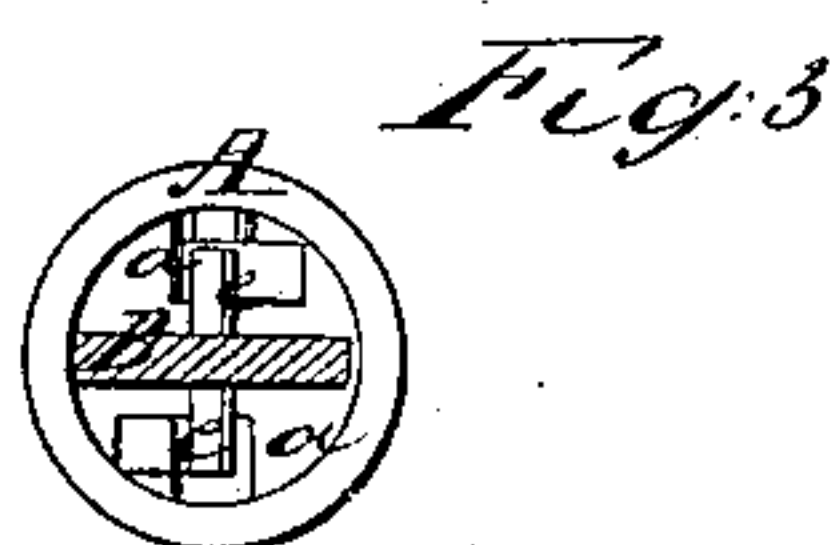
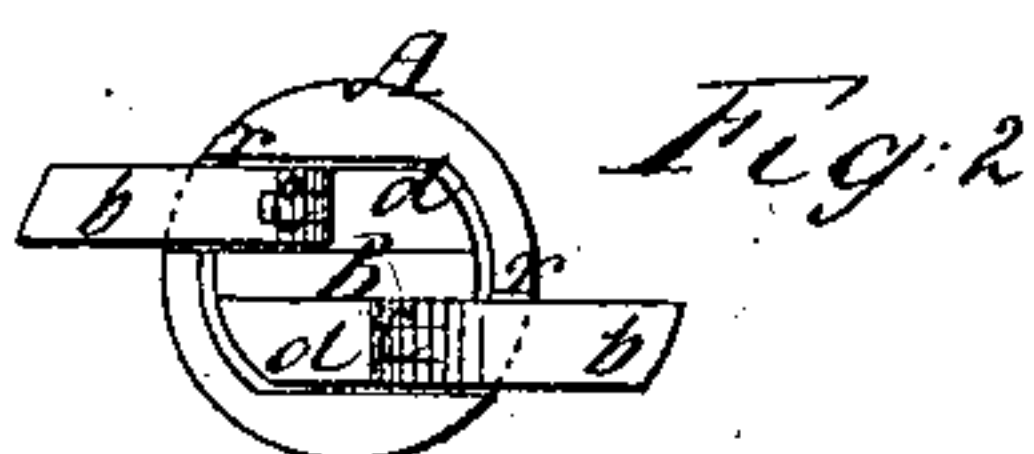
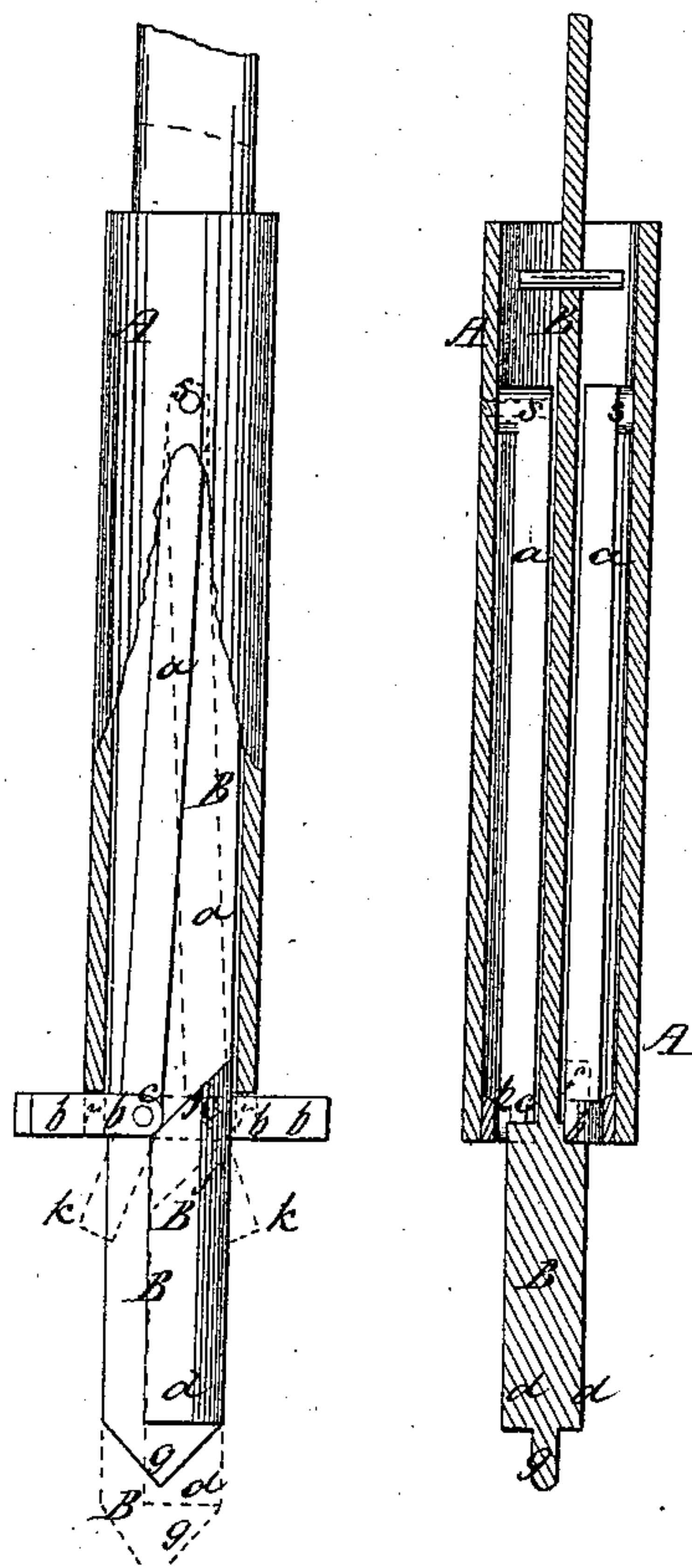


*E. C. Dow,*  
*Expanding Rock Drill,*  
*No 52,831. Patented Feb. 27, 1866.*

*Fig 1*

*Fig 5*



*Witnesses*  
*J. H. Coombs*  
*L. Holmes for*

*Inventor*  
*Edward C. Dow*

# UNITED STATES PATENT OFFICE.

EDWIN C. DOW, OF BROOKLYN, NEW YORK.

## IMPROVED BORING-TOOL FOR OIL-WELLS.

Specification forming part of Letters Patent No. 52,831, dated February 27, 1866; antedated February 11, 1866.

*To all whom it may concern:*

Be it known that I, EDWIN C. DOW, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Expanding Boring-Tools for Oil-Wells and other Purposes; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a longitudinal view, partly in section, of a boring-tool constructed according to my invention. Fig. 2 is a bottom view of the same, representing the cutters thrown outward, the same as in Fig. 1. Fig. 3 is a top view of the bore, representing the cutters drawn in, and Fig. 4 is a bottom view of the same as represented in Fig. 3. Fig. 5 is a central vertical section of the tool at right angles to Fig. 1.

Similar letters of reference indicate corresponding parts in all the figures.

After oil-wells have been sunk it is desirable to enlarge the size of the bore at the bottom, so as to form a chamber for the purpose of obtaining a more copious flow of oil by exposing more surface, and to obtain a reservoir for the oil.

The principal object of this invention is to facilitate the forming or boring of such chambers; and it consists in a novel mode of applying and adjusting the cutters, whereby their expansion, while the tool is in the well, is provided for, and provision is made for withdrawing them through the smaller portion of the bore above after the chambering of the lower portion has been completed.

A is a cylindrical tubular stock of iron or steel, of such length as may be required, according to circumstances, and of such external size as to pass easily down the bore of the well.

Two arms, *a a*, Figs. 1 and 3, are pivoted at their upper ends by pins *s s* to the inside of the stock A, opposite to each other, in such manner that the lower ends of said arms can vibrate in planes parallel with the diameter of the tube. One of these arms *a* is shown in Fig. 1, in which the stock A is represented as being removed for that purpose. To the lower end of each of these arms a cutter, *b*, is hinged by one end, as shown at *c*, Figs. 1 and 2.

These cutters *b* are fitted into square recesses *r r* in the lower end of the stock A in such a manner that they can slide therein, and that the cutters are even with the lower end of the stock A when the cutters are in the position represented in Fig. 2 and the positions shown in black and red outline in Fig. 1.

B is a flat rod fitted to slide through the center of the stock A between the arms *a a*, which are arranged one on each side of the center of the stock. This central rod, B, is provided at its upper end with a cross-piece, *e*, Fig. 3, which extends over the upper ends of the arms *a*, where it acts as a stop to prevent the rod from falling down any lower than is requisite. The lower end of said central rod, B, is provided with two projections, *d*, Figs. 1, 2, and 4, one on each side, diagonally opposite to each other, and each made at the upper end with an inclination or wedge surface, *f*, as shown in Fig. 1. The length of the central piece, B, below the inclinations *f*, Fig. 1, depends upon the depth of the chamber to be bored. The upper end of the stock A is to be firmly attached to a tubular boring-bar in any suitable manner. The outer ends of the cutters *b b* may be faced with diamonds or other hard jewels.

When this tool is to be applied to use the central piece, B, is pushed or allowed to drop downward through the stock A, so that the whole length of the projections *d* and the inclinations *f*, Fig. 1, protrude through the bottom of the stock, and the cutters *b b* are pressed horizontally inward, as shown in red outline in Fig. 1, and also shown in Fig. 4, so that the outer ends or cutting-edges will be even with or not project beyond the periphery of the stock, and in this condition the tool is lowered into the well or inserted into the bore to be chambered until the point *g*, Fig. 1, of the central rod touches the bottom. When used in a vertical or nearly vertical position the weight of the stock and its attached rod presses the inner ends of the cutters *b b* against the wedges *f*, which are thus caused to force the cutters outward; but when the tool is used in any other position some other means of forcing the stock into the bore must be used, and as the tool is turned the cutters cut their way outward until they have been pressed out to their full extent, after which, as the bor-



ing progresses, the inner ends of the cutters *b* will slide along the sides of the projections *d* until the cutters arrive at the bottom of the bore and the chamber is finished. In this operation the cutters are supported in an extended position by the tops or backs of the recesses *r r* in the stock.

When the tool is withdrawn from the bore, the ends of the cutters, coming in contact with the top or back of the chamber they have cut, will be turned downward or inward, as represented by dotted lines at *k*, Fig. 1, thus permitting the tool to pass freely up or back through the smaller bore above the chamber.

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

The combination of the tubular stock *A*, the pivoted vibrating rods *a*, the hinged cutters *b*, and the central sliding rod, *B*, with its projections *d* and wedges *f*, substantially as herein specified.

EDWIN C. DOW.

Witnesses:

HENRY T. BROWN,  
J. W. COOMBS.