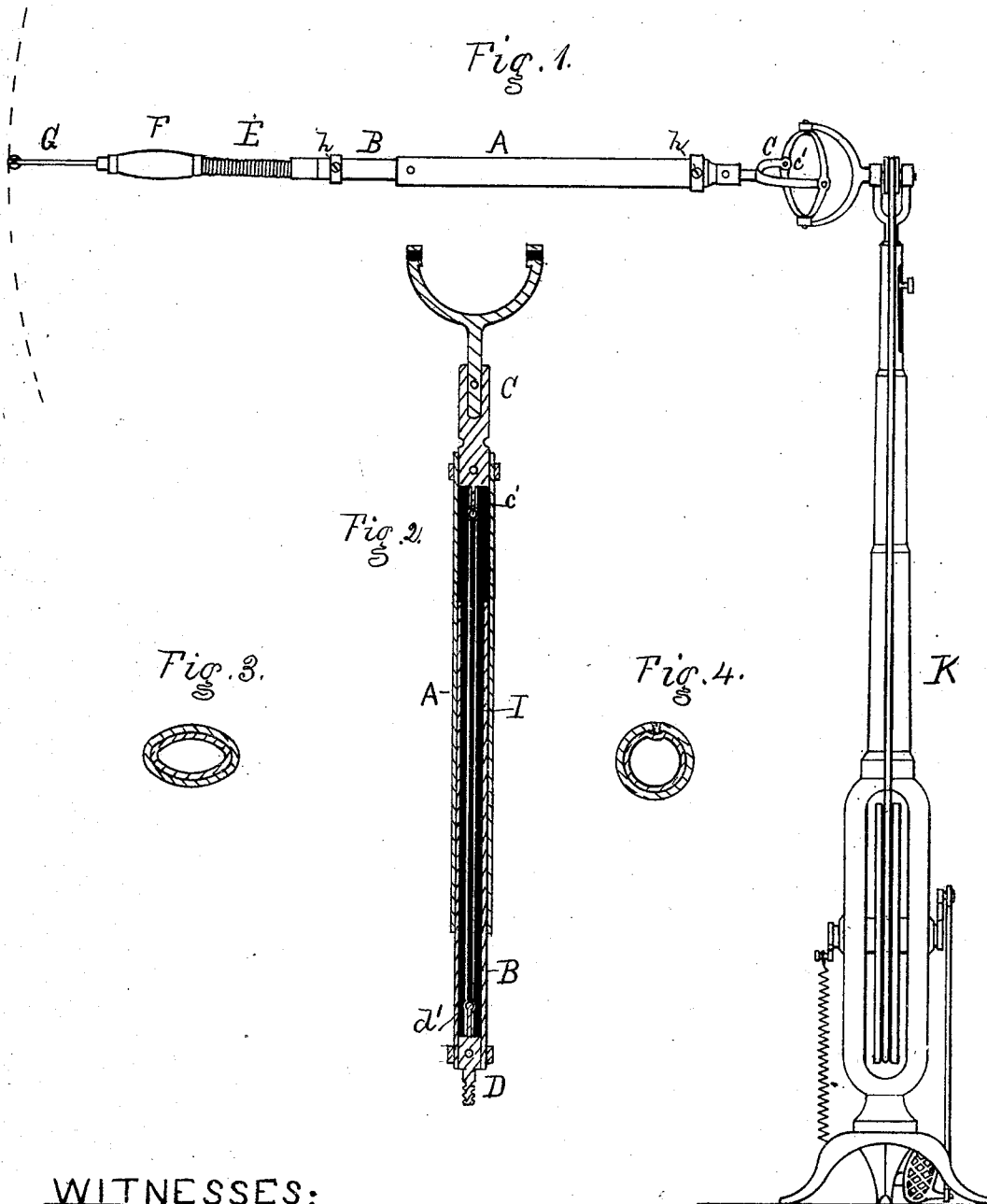


**C. E. EDWARDS.**  
**Dental Drilling-Machines.**

No. 145,098.

Patented Dec. 2, 1873.



WITNESSES:

*Isaac H. Jones*  
*Andrew H. Smith*

INVENTOR:

*Charles E. Edwards*

# UNITED STATES PATENT OFFICE.

CHARLES E. EDWARDS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
SAMUEL S. WHITE, OF SAME PLACE.

## IMPROVEMENT IN DENTAL DRILLING-MACHINES.

Specification forming part of Letters Patent No. **145,098**, dated December 2, 1873; application filed  
June 3, 1873.

*To all whom it may concern:*

Be it known that I, CHARLES E. EDWARDS, of the city of Philadelphia, in the State of Pennsylvania, have invented certain improvements in Dental Drilling-Machines, of which the following is a specification:

My invention relates to the mode of constructing the arm which carries the drill, in such a manner that, while in the operation of drilling, the pressure of the drill will be in accordance with the pressure of the hand or fingers of the dentist in operating upon the tooth of the patient, as heretofore. The retraction of the drill will be automatic, or entirely without any assistance from the operator, except to support and direct it. This I accomplish by constructing the arm of two tubes, accurately fitted to slide the one within the other, in combination with an elastic core or central cord of elastic gum, or a spiral spring, having one of its ends attached to the outer end of the inner tube, and its other end attached to the outer end of the outer tube, and the length of said elastic cord or spiral spring being such as to cause it to be moderately stretched or strained within the inner tube when the latter is fully retracted within the outer tube, and, at the same time, allow the inner tube to be drawn out to the extreme length of the same without breaking, or unduly and permanently stretching or impairing, the retractile power of the said elastic cord or central core; the object of my invention being to afford greater facility in the direction and control of the drill-carrying arm, and avoid the necessity and delay which would be consequent, as heretofore, of carefully pushing back the inner tube within the outer one on every occasion in which drilling would have to be resorted to.

Figure 1 is a side elevation of a dentist's portable drilling stand or lathe, embodying my invention. Fig. 2 is an enlarged longitudinal central section of my improved drill-arm, showing the two tubes and the elastic core in their relation to each other, and to the respective end attachments, for connection with the stand and the drill, the inner tube being also partially drawn outward. Fig. 3 is a transverse section of the two tubes enlarged. Fig. 4 is a like section, showing a modification in the form

of the tubes, whereby any rotary motion of the inner tube within the outer one is prevented.

The outer tube, A, and the inner tube, B, are both made of sheet metal, and accurately fitted together, so that the inner tube, B, will slide accurately and smoothly within the outer tube, A, when moved by the operator. One end of each of said tubes is closed by a solid piece of metal, the outer tube, A, being firmly secured to the stem C of one portion of a common universal joint, *c'*, and one end of the inner tube, B, being firmly secured to the solid stem D, to which the usual spiral E, handle F, and drill G are adjustably secured. The inner ends of the solid pieces C and D have each a central stem, *c' d'*, ending with a small globular head. Each of the solid pieces is secured permanently in place by means of a small screw, *h*, which enters through the tube into the solid piece, and thus allows the said solid piece to be easily inserted or withdrawn, as occasion may require. The elastic core I is, in the present instance, a slender tube of elastic gum; and is applied by first detaching one of the solid pieces, (say C,) slipping the end of the elastic core over the globular end *c'* of the projecting stem, and tying fast by lapping a thread around the same. The said core is then passed through the inner tube, B, and the solid piece C screwed fast in the end of tube A. The inner tube, B, being pushed into the outer one, A, as far as it will go, its solid piece D detached, and the elastic core I drawn or stretched out sufficiently, is secured over the head of the stem *d'* and tied fast by a lapping-thread, as described in the other case, and then the solid piece D inserted and secured by its screw, the length of the elastic core I being cut to such a length as will cause it to be slightly on a stretch when the two tubes A and B are closed up together. In the present instance, the tubes A and B are made oval, as shown in Fig. 3, for the purpose of preventing the outer tube, A, to which the universal joint *c'* is directly connected, from slipping around the inner tube, B, to which the drill G is attached, during the rotary motion of the said outer tube. As a modification of the form of said tubes, the inner one may be made cylindrical, and then grooved longitudinally from end to end on one side, or

slightly indented thereat, for the reception of a small pin projecting from the inside of the end next to the drill of the outer tube, as represented by Fig. 4, the said outer tube being also cylindrical; but the oval form shown in Fig. 3 is believed to be the better one. Rotary motion is given to the arm by means of a treadle, cord, and pulleys attached to an upright portable stand, K, in the usual well-known manner, the operator guiding the drill by means of the handle F, within which the drill rotates.

It will be readily understood, without any further explanation, that the rotary and the longitudinal forward motions of the drill can be given by the operator with the most perfect facility, ease, and accuracy, and that, as the retractive action is automatic, the trouble and difficulty of withdrawing the drill from the tooth-cavity by the positive motion of his hand against frictional resistance, and the consequent risk of injuring the form of the said cavity, are entirely avoided.

I am aware that a weight suspended from a cord passing over pulleys, and connected to the sliding drill-carrier by means a swivel, has been tried for the purpose of automatically retracting the drill, but this contrivance is complicated and very liable to get out of order. I, therefore, do not desire to claim, broadly, the application of the principle of withdrawing or retracting the drill automatically; but

What I desire to secure by Letters Patent is confined to the following, viz:

In dental drilling-machines, the combination of the elastic core I with the tubes A and B of the horizontal arm of the machine, so as to automatically withdraw the tool while it is rotating, substantially as hereinbefore described.

CHARLES E. EDWARDS.

Witnesses:

ANDW. J. BOSWELL,  
ISAAC H. JONES.