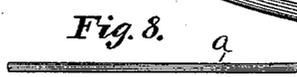
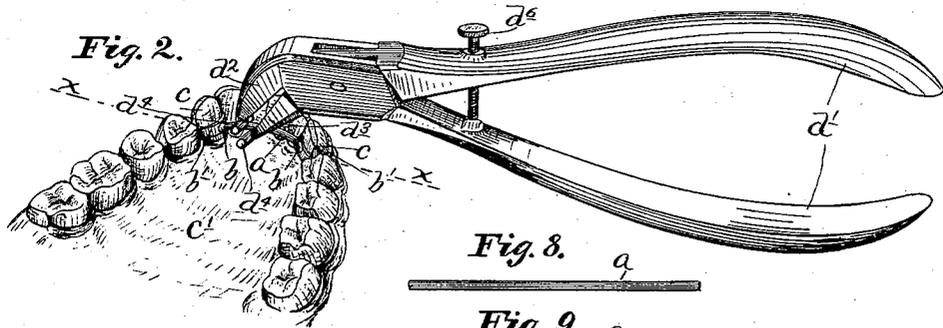
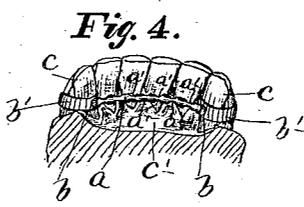
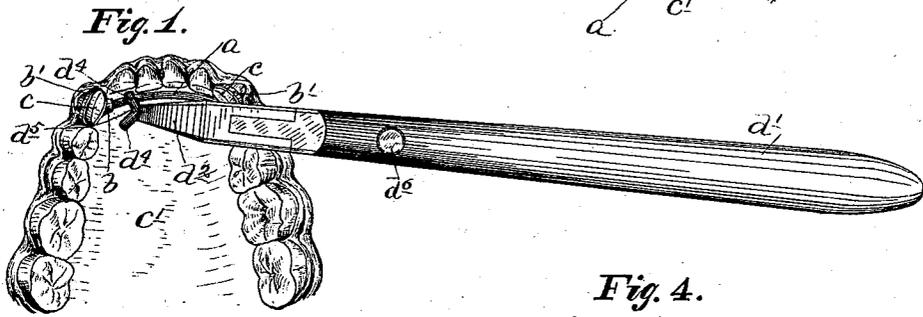
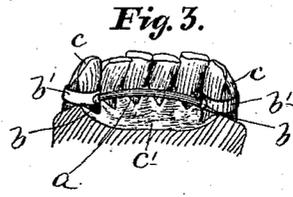
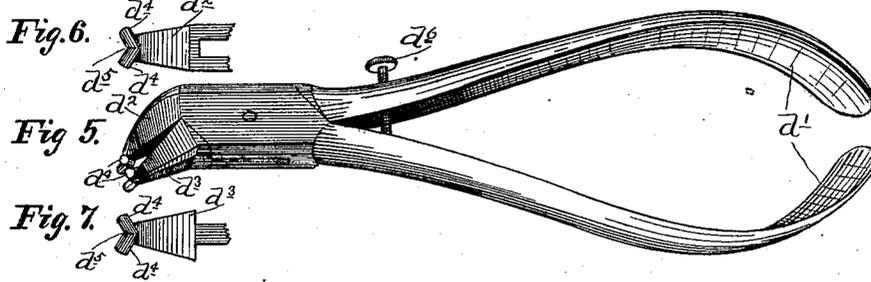


(No Model.)

E. H. ANGLE.  
DENTAL REGULATING PLIERS.

No. 536,166.

Patented Mar. 19, 1895.



Witnesses:  
*C. F. Kilgore*  
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Inventor.  
*Edward H. Angle.*

*Jas. F. Williamson*

# UNITED STATES PATENT OFFICE.

EDWARD H. ANGLE, OF MINNEAPOLIS, MINNESOTA.

## DENTAL REGULATING-PLIERS.

SPECIFICATION forming part of Letters Patent No. 536,166, dated March 19, 1895.

Application filed July 5, 1894. Serial No. 516,621. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD H. ANGLE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Dental Regulating-Pliers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide a form of pinchers or pliers, especially adapted for use by dentists in the regulation of teeth.

My invention and its use are illustrated in the accompanying drawings, wherein like letters refer to like parts.

Figure 1 is a plan view showing my regulating device applied to the teeth of a human jaw, and my improved pinchers in operative position thereon; and Fig. 2 is a perspective of the same. Fig. 3 is a vertical section looking from the rear of the jaw, shown in Figs. 1 and 2, said section being taken on the line X X of said Fig. 2, and the extensible rod being shown in its normal condition. Fig. 4 is a similar view to Fig. 3, the extensible rod being shown as lengthened by pinching, or the displacement of the particles of its mass. Fig. 5 is a perspective view of the pinchers, and Figs. 6 and 7 are views, in plan, showing the inside faces of the pincher jaws, the body of the pinchers being broken away. Figs. 8 and 9 are plan views showing the rod or wire which is used for regulating purposes, respectively, before and after, it has been lengthened by pinching, or the displacement of the particles of its mass.

In an improved method of regulating teeth which I have invented, I employ a rod or a wire  $a$ , preferably of German silver, such as shown in Fig. 8, and apply the same to operate with a pulling or pushing action on the tooth or teeth to be regulated, when the rod is lengthened by displacement in the particles of its mass. For example, the rod may be applied, as shown in Figs. 1, 2, 3 and 4, where it is sprung into ferrules  $b$ , formed on the bands  $b'$ , which are secured to the teeth  $c$ , both of which require to be pushed outward in the dental arch of the jaw  $c'$ . When the rod is thus in position, it may be lengthened

by reducing its cross section, and thereby producing longitudinal displacement in the particles of its mass. This displacement is most conveniently effected by a pair of pinchers. If the rod or wire  $a$  be originally of the length for instance, as shown in Fig. 8, it may be extended to the length shown in Fig. 9, by four applications of the pinchers, the bite of which on the rod is shown at  $a'$ . Hence, when the rod has been properly applied to the teeth which are to be regulated, it may be readily extended at will, to render the same effective for regulating the teeth.

Figs. 3, 4, 8 and 9, and the jaw shown in Figs. 1 and 2 of the accompanying drawings, and the foregoing description thereof, have been embodied in this case, simply for the purpose of illustrating the necessity for and the advantages of my improved form of pinchers, illustrated in Figs. 1, 2, 5, 6 and 7.

The rod  $a$ , as usually applied, lies close to the dental arch or the line of the teeth; and hence in nearly all cases, it would be extremely difficult and in most cases impossible to properly pinch the rod, for purposes of extension, by the ordinary pinchers. Hence, to meet the requirements of the case, I provide a pair of pinchers  $d'$   $d^2$   $d^3$   $d^4$   $d^5$  and  $d^6$ , the parts of which are constructed for the special purposes had in view. To these ends, the pincher-jaws  $d^2$   $d^3$  are of tapering form outward and of slightly curvilinear form downward, as shown in Figs. 2 and 5. The under jaw  $d^3$  is extended beyond the upper jaw  $d^2$ ; and both jaws are provided with lateral horns or projections  $d^4$ , extending outward and forward, at an angle to the plane of movement of the pinchers, one horn from each side of each jaw, the upper and lower members of which horns  $d^4$  co-operate to form the active surfaces, for effecting the bite or pinching action on the rod. It follows from the fact that the horns  $d^4$  project forward as well as sideways, that the said jaws, looking from the plan, form a crotch, having a depression or central clearance as shown at  $d^5$ . The said horns  $d^4$  taper slightly from base to tip, and are of curvilinear form in cross section. One of the handles  $d'$  has tapped therein an adjustable stop  $d^6$ , the inner end of which bears against the other handle, which construction serves to determine and limit the bite of the

pinchers, under the closing action of the handles, thereby preventing the severing of the wire.

5 As is evident, the adjustable stop  $d^6$  might be dispensed with, and the pinchers provided with a fixed stop which would prevent the pinching portions of the pinchers from coming into contact.

10 Having regard to the action, it is, of course, obvious, that either the right or the left set of the horns  $d^4$  may be used, according as convenience may require, in reaching the rod, wherever applied to either jaw. Otherwise stated, the tool will operate either right or left, and is universal for the purposes had in view. The fact that the jaw  $d^2$  is shorter than the jaw  $d^3$ , permits direct opposition of the co-operating horns  $d^4$  in the biting action, notwithstanding the angle to the jaw, at which the pinchers must be worked by the operator; and in virtue of the right and left set of horns  $d^4$ , this will come right regardless of whether the rod be located on the lower or the upper jaw, or on the one or the other side of either jaw.

25 By directing attention to the manner in which the pinchers are applied to pinch the rod, as shown in Figs. 1 and 2, it will be seen, first, by reference to Fig. 1, that it is of the utmost importance that the horns  $d^4$  should be turned at a forward angle, as described, and second, that the under jaw of the pinchers should project farther forward than the up-

per jaw. With this construction, the horns  $d^4$  may always be applied to the rod  $a$  at right angles thereto, thus preventing the bending or twisting of the rod. 35

By actual usage, I have demonstrated the efficiency of this form of pinchers, for the purposes stated. 40

It will, of course, be understood, that there may be other uses, for which this special form of pinchers might be serviceable. 45

What I claim, and desire to secure by Letters Patent of the United States, is as follows: 45

1. A pair of pinchers having pivoted downwardly curved jaws provided at their forward ends with pinching horns projecting at an angle to the plane of movement of the pinchers, substantially as described. 50

2. A pair of pinchers having downwardly curved pivoted jaws, the lower jaw being slightly longer than the upper, and pinching horns, at the extremities of said jaws, projecting at an angle to the plane of movement of the pinchers, substantially as described. 55

3. A pair of pinchers having on each jaw a right and a left horn projecting sidewise and forward from the center of the jaw tip, substantially as and for the purpose set forth. 60

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD H. ANGLE.

Witnesses:

JAS. F. WILLIAMSON,  
E. F. ELMORE.