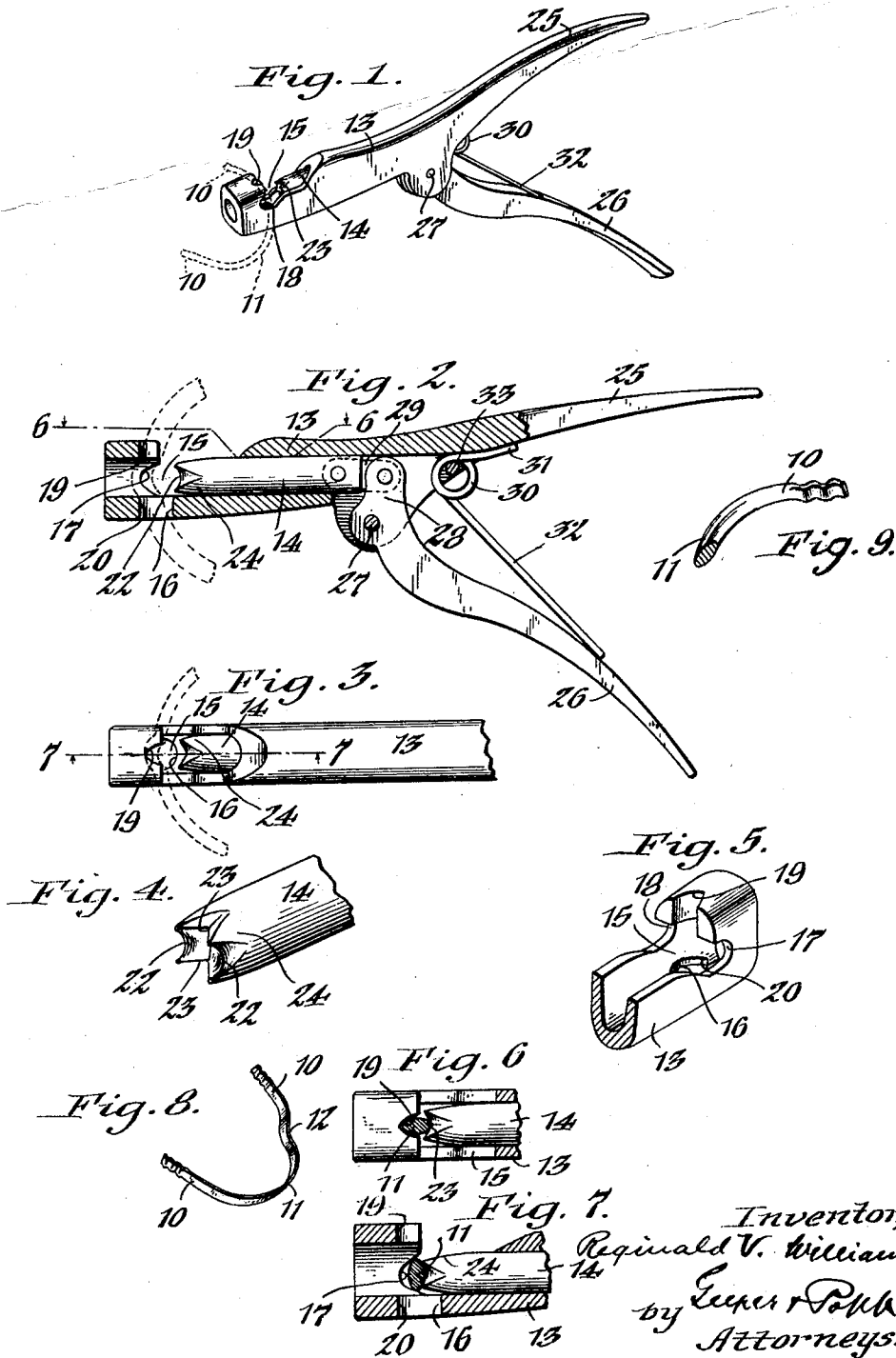


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BENDER FOR BARS, RODS, AND WIRES.
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UNITED STATES PATENT OFFICE.

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BENDER FOR BARS, RODS, AND WIRES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, REGINALD V. WILLIAMS, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Benders for Bars, Rods, and Wires, of which the following is a specification.

This invention relates to a bar, wire or rod bender and more particularly to a tool for bending lingual bars such as are used by dentists for connecting the sections of a denture.

In order to adapt a lingual bar to the mouth of a certain person, the bar must be bent into suitable form to pass over the muscles under the tongue and around a maloccluding tooth as well as adapt the same to other peculiar formations of the particular mouth, so as to render the fit of the denture as comfortable as possible.

This invention has for its object the production of a bending tool which is particularly useful in dentistry for bending lingual bars and the like easily, readily and quickly into the various forms required to make the same fit the mouth of a certain person with a maximum degree of comfort.

In the accompanying drawings: Figure 1 is a perspective view of the bar bender embodying my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a fragmentary top plan view of the tool. Fig. 4 is a fragmentary perspective view of the plunger. Fig. 5 is a similar view of the barrel. Fig. 6 is a horizontal section on line 6—6, Fig. 2. Fig. 7 is a vertical section on line 7—7, Fig. 3. Fig. 8 is a perspective of one form of lingual bar which may be produced by this tool. Fig. 9 is a vertical longitudinal section of another form of lingual bar which may be produced by this tool.

Similar characters of reference indicate corresponding parts throughout the several views.

Lingual bars, rods or wires are used in dentistry for connecting the sections of a denture which are located in different parts of the mouth. This bar is originally straight and usually of oval form in cross section, and in order to suit a particular mouth and denture, this bar must be bent into a substantially U-shaped form, as shown in Fig. 8, the arms 10 of the same being either depressed or raised relatively to the bow 11

thereof, the bow in many instances being arranged at an angle, as shown in Fig. 9, and inwardly bent turns being formed on the bar whenever required, as shown for instance at 12 in Fig. 8, to permit the bar to pass around a maloccluding tooth.

In the preferred form of the tool for effecting this bending of the bar, the same comprises a guide barrel or tubular body 13 in which a plunger or punch 14, preferably of cylindrical form, reciprocates lengthwise. Adjacent to its front end this barrel is provided on its upper side with a mouth 15 which extends from the periphery of the barrel to the bore of the same on the diametrically opposite side thereof. On the underside of the barrel opposite its mouth the same is provided with an opening 16.

17, 18 represent one pair of horizontal concave abutment or anvil seats formed on diametrically opposite sides of the barrel and preferably on the front side of the mouth 15, these seats being adapted to form a support for the lingual bar in one position thereof while being operated upon. These horizontal abutment seats are preferably made comparatively wide and of blunt form, so that a lingual bar of oval cross section can be engaged therewith either sidewise or in a more or less angular position, in order to place the lingual bar in the required position to produce the desired bends in the same.

19, 20 represent a pair of vertical concave abutment or anvil seats formed on diametrically opposite sides of the barrel, preferably at right angles to the horizontal seats 17, 18, these vertical seats being preferably made comparatively narrow and of sharp form, so that a lingual bar of oval cross section can be engaged edgewise therewith and held reliably in place when it is desired to bend the bar in a plane parallel with its long or major axis. The upper vertical seat 19 is arranged on the upper front side of the mouth of the barrel and the lower seat 20 is formed on the front side of the opening 16. At its front end this plunger is provided with two pairs of concave seats 22, 23, the members of one pair being arranged at right angles to the other pair. The pair of seats 22 are arranged horizontally and adapted to cooperate with the horizontal seats of the barrel and the seats 23 are arranged vertically and adapted to cooperate with the

vertical seats of the barrel. The front end of the plunger tapers forwardly, as shown at 24, for a purpose which will presently appear.

5 The reciprocating movement may be imparted to the plunger by any suitable means, those shown in the drawings being preferred and comprising a handle 25 projecting rearwardly from the upper part of the barrel, 10 a hand lever 26 pivoted by a transverse pin 27 to the lower rear part of the barrel and having an upper arm 28 which is operatively connected with the plunger by a link 29, a 15 spring for yieldingly keeping the handle and hand lever spread apart and consisting of a coil 30 having arms 31, 32, which engage said handle and lever, respectively, and a pin 33 arranged on the rear part of the barrel and passing through said coil for retaining the spring in place.

20 When it is desired to produce a lingual bar of the form shown in Fig. 8, the straight bar blank is placed crosswise in engagement with the horizontal blunt anvil seats and 25 then the plunger is moved forwardly and pressed against the rear side of the bar between the horizontal anvil seats, as shown in Fig. 7, whereby the bar is bent so that its ends turn backwardly while that part immediately between the anvil and plunger 30 seats is moved forwardly. By repeating these operations on successive parts of the bar the same may be by degrees gradually bent parallel with its minor axis into horse-shoe or U-shape, as shown by dotted lines in Fig. 3. If parts of the bar require a reverse 35 or inward bend in order to avoid a maloccluding tooth, such an inwardly turned bend, as shown at 12 in Fig. 8, may be produced by either reversing the previously bent U-shaped bar and placing the same across the horizontal seats or the vertical 40 seats of the anvil, as shown in Fig. 1, preparatory to closing the plunger on the same.

45 If the bar requires the bow to be arranged at a rearwardly-sloping angle, this may be produced by first placing the bar blank vertically across the vertical pair of anvil seats and pressing the same by means 50 of the vertical seat of the plunger, as shown in Fig. 6, thereby bending the bar parallel with its major axis, so that upon subsequently bending the bar as a whole into U-shape, the same bow will be offset from the arms, as shown in Fig. 9. By presenting the bar blank in different positions to the horizontal and vertical seats of the anvil and plunger, the bar may be bent into any 55 desired shape to suit the requirements of a particular case.

60 As the bar blank is bent, those parts in immediate engagement with the anvil and plunger are moved forward while those parts on opposite sides of the plunger are 65 thrown backwardly, this being possible by

reason of the clearance which is afforded between the anvil and plunger by the taper form of the front end of the latter.

It will be obvious from the foregoing that this device permits of properly shaping or 70 bending lingual bar and orthodontia wires and appliances commonly used in the dental profession as well as other purposes. The blanks may be bars, rods or wires of any 75 desired form in cross section such as round, half round, oval or square, and of gold, silver or other desired metal.

Although the bending tool may be constructed of any suitable metal, its barrel and plunger are preferably constructed of brass 80 or copper which will not mar or nick the precious metal bars, wires or rods while being bent.

By constructing the contact end of the plunger in the form of concave seats arranged horizontally and vertically corresponding to the companion seats on the barrel, the bender is able to obtain a better hold on the blank while bending the same.

Furthermore, many bends in the bar 90 which have heretofore been made with great difficulty can be made with this bar bender easily and perfectly.

I claim as my invention:

1. A bar bender comprising a barrel provided at its front end with a pair of concave seats on its opposite sides with which the bar to be bent is adapted to engage crosswise, and a plunger guided in said barrel and adapted to engage at its front end with said 100 bar between said seats.

2. A bar bender comprising a barrel provided at its front end with a pair of concave seats on its opposite sides with which the bar to be bent is adapted to engage crosswise, and a plunger guided in said barrel 105 and having a forwardly-tapering front end which is adapted to engage with said bar between said seats.

3. A bar bender comprising a barrel provided at its front end with a pair of concave seats on its opposite sides with which the bar to be bent is adapted to engage crosswise, and a plunger guided in said barrel 110 and provided at its front end with a concave seat which is adapted to engage with said bar between the seats on said barrel.

4. A bar bender comprising a barrel provided at its front end with two pairs of concave seats, the members of each pair being 120 arranged on opposite sides of the barrel and at right angles to the seats of the other pair, either of said pairs of seats being adapted to receive the bar to be bent in a position crosswise of the barrel, and a plunger 125 guided in said barrel and adapted to engage its front end with said bar between said pairs of seats.

5. A bar bender comprising a barrel provided at its front end with two pairs of con- 130

cave seats, the members of each pair being arranged on opposite sides of the barrel and at right angles to the seats of the other pair, either of said pairs of seats being adapted to receive the bar to be bent in a position crosswise of the barrel, and a plunger guided in said barrel and provided at its front end with two concave seats which are arranged at right angles to each other and either of which is adapted to engage said bar between said pairs of seats on the barrel.

6. A bar bender comprising a barrel provided at its front end with two pairs of concave seats, the members of each pair being arranged on opposite sides of the barrel and at right angles to the seats of the other pair, either of said pairs of seats being adapted to receive the bar to be bent in a position crosswise of the barrel, and a plunger guided in said barrel and adapted to engage its front end with said bar between said pairs of seats, the members of one pair of seats on the barrel being comparatively sharp and the members of the other pair of seats being comparatively blunt.

7. A bar bender comprising a barrel provided at its front end with two pairs of concave seats, the members of each pair being arranged on opposite sides of the barrel and

at right angles to the seats of the other pair, either of said pairs of seats being adapted to receive the bar to be bent in a position crosswise of the barrel, and a plunger guided in said barrel and provided at its front end with two concave seats which are arranged at right angles to each other and either of which is adapted to engage said bar between said pairs of seats on the barrel, the members of one pair of seats on the barrel being comparatively sharp and the members of the other pair of seats being comparatively blunt and the seats on the plunger which cooperate with the two pairs of seats on the barrel being of corresponding sharp and blunt form.

8. A bar bender comprising a barrel provided at its front end with a pair of concave seats on its opposite sides with which the bar to be bent is adapted to engage crosswise, a plunger guided in said barrel and adapted to engage at its front end with said bar between said seats, a handle arranged on the rear end of the barrel, a lever pivoted on the rear part of the barrel and operatively engaging with the plunger, and a spring interposed between said handle and lever and operating to separate the same.

REGINALD V. WILLIAMS.