Sept. 15, 1931. J. M. CRAIGO 1,823,090

DENTAL MACHINE

Filed June 13, 1928 2 Sheets-Sheet 1

Fig. 1.

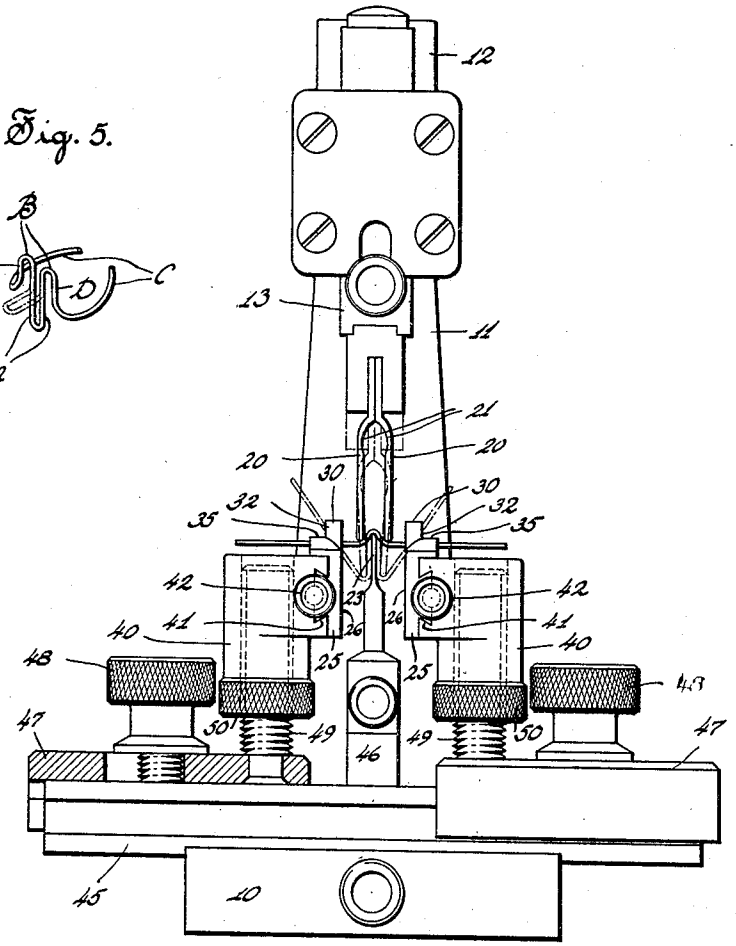
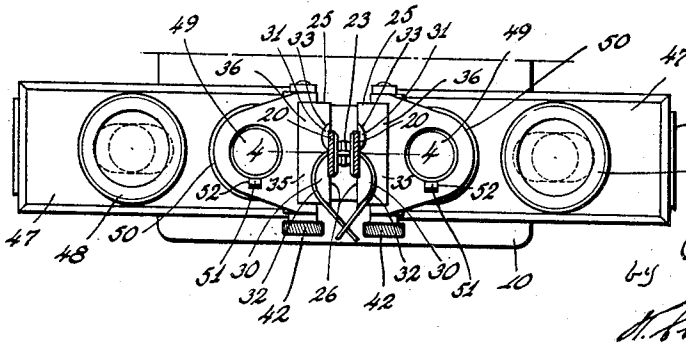


Fig. 5.

Fig. 2.



Inventor
John M. Craigo
by
H. Clay Lindsay
His Attorney

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Fig. 3.

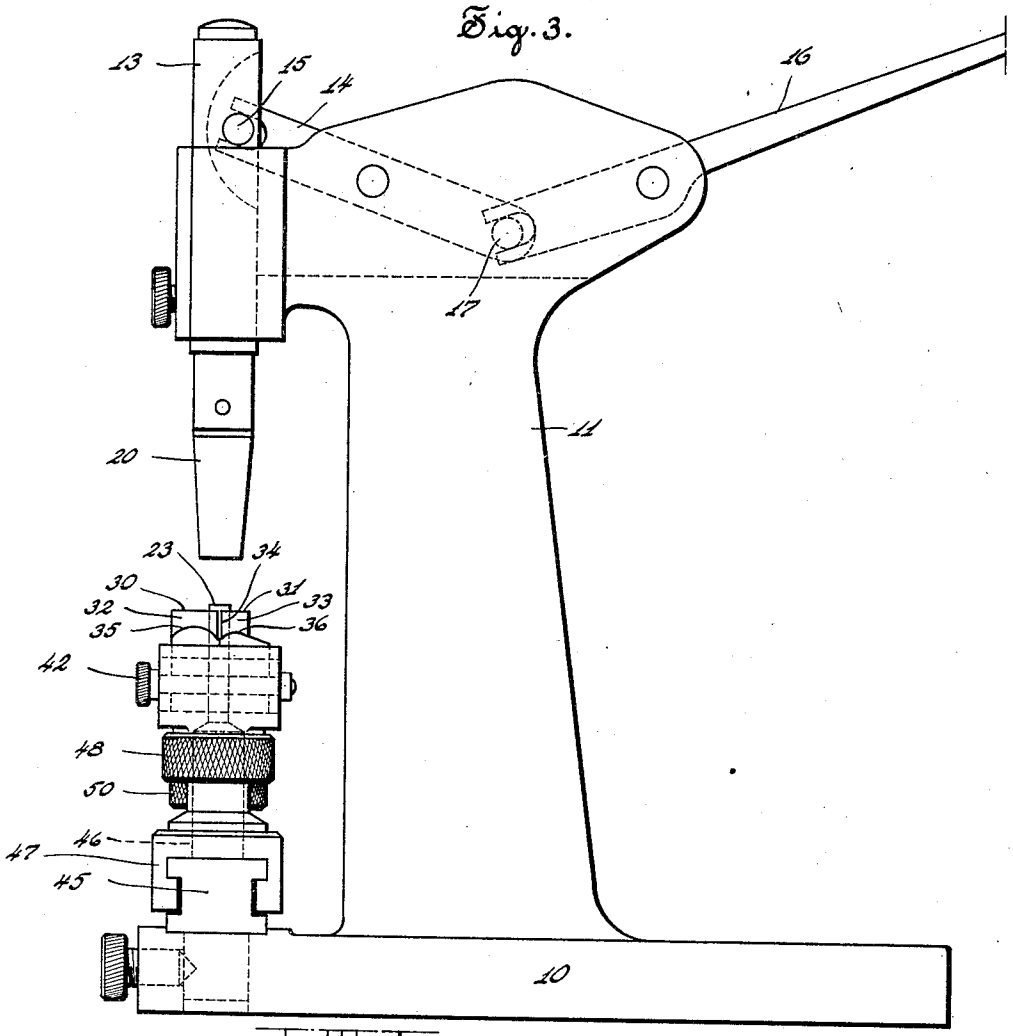
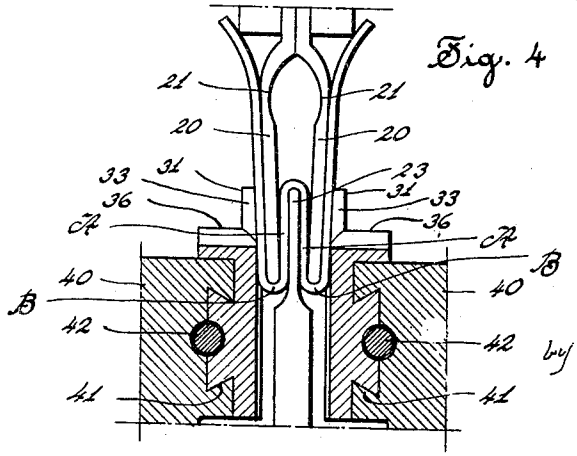


Fig. 4



Inventor
John M. Craigo
by H. Clay Lindsley
His Attorney

Patented Sept. 15, 1931

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UNITED STATES PATENT OFFICE

JOHN M. CRAIGO, OF HARTFORD, CONNECTICUT

DENTAL MACHINE

Application filed June 13, 1928. Serial No. 285,154.

This invention relates to a machine for use in dental work, and has particular reference to an apparatus for forming wire clasps removably attached to a tooth and to which clasps a denture is to be secured.

The object of the present invention is to provide a simple and effective apparatus by means of which clasps of the character described may be accurately formed at a relatively slight expense of time and labor.

A further aim of the invention is to provide a machine of this sort by means of which clasps varying in size and shape may be quickly and properly formed.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the appended claims.

In the accompanying drawings, wherein I have shown, for illustrative purposes, one embodiment which the present invention may take:

Figure 1 is a front elevational view of the machine;

Fig. 2 is a horizontal sectional view of the bottom portion thereof;

Fig. 3 is a side elevational view of the machine;

Fig. 4 is a vertical sectional view taken substantially on line 4—4 of Fig. 1, and shows the operation of bending a wire into clasp form; and

Fig. 5 is a perspective view of a clasp of the type adapted to be formed in the machine of the present invention.

The machine of the present invention has certain features in common with the dental machine disclosed in my co-pending application Serial No. 280,005, filed May 23, 1928. For a more specific description of certain of the parts, that application may be referred to.

In order that the construction and operation of the machine may be more clearly understood as the description proceeds, the clasp shown in Fig. 5 will first be described. This clasp is formed of wire and has a central U-shaped portion with legs A, reverse bends or U-shaped loops B at the extremities of the legs A, and arms C projecting from the legs D of the reverse loops. The U-shaped portion A may be bent intermediate its ends so as to form an outwardly extending tongue, as shown by dotted lines in Fig. 5. The arms C are adapted to straddle a tooth in the mouth, and a denture is adapted to be soldered or otherwise secured to the tongue. Obviously, the size and shape of the clasp will vary in accordance with the tooth to which it is removably secured and with the denture adapted to be secured to the clasp.

Referring to the machine in detail, it has a frame with a base 10, a standard 11 and a head 12. Mounted for vertical reciprocating movement in the head is a plunger 13 of any desired construction. The plunger may be moved up and down through any desired form of mechanism; for example, there may be pivoted in the head a lever 14, the forward end of which is bifurcated so as to straddle a pin 15 carried by the plunger. 16 is an operating handle pivoted in the head and having its forward end bifurcated so as to straddle a pin 17 on the rear end of the lever 14.

Carried by the plunger is a bending fork having a pair of spaced flexible blades or prongs 20 which are flat and parallel.

In the present instance, the blades or prongs 20 are of slightly reduced thickness, as at 21, so as to give to the blades the desired flexibility. Opposed to the open or lower end of the fork is a central die member which is in the form of a blade 23. The upper end of this blade 23 constitutes a ridge over which the blades 20 are adapted to bend the wire so as to form the central U-shaped portion A of the clasp. As will be seen most clearly from Figs. 1 and 3, the blade 23 is parallel to the blades 20 and is adapted to be straddled by those blades.

Located to opposite sides of the central blade 23 are members or elements which con-

stitute rests for supporting the wire while being bent by the blades 20 about the blade 23. These members also are employed for bending the wire so as to complete the reverse loops B of the clasp. They further constitute bending dies or surfaces for determining the shapes and sizes of the arms C of the clasp. These members are designated generally by the numeral 25. The opposed surfaces 26 of these members 25 are parallel to the plane of the blade 23. Upon the upper ends of these members are forming or bending surfaces about which the arms C of the clasp are adapted to be shaped. Each is provided with a pair of upwardly extending projections 30 and 31. The outside surfaces of the projections 30 are curved or rounded, as at 32, so as to form the opposite sides of a circle, so to speak. The outside surfaces 33 of the projections 31 are curved in a similar manner. Between each pair of projections is a slot 34. The projections 31 are smaller than the projections 30. At the base of each of the curved surfaces on the projections are vertically curved or arched bending or forming surfaces. For example, at the base of each of the projections 30 is a vertically curved surface 35, and at the base of each of the projections 31 is a vertically curved surface 36.

It will be noted that the upper ends of the members 25 are generally similar in construction and arrangement to the corresponding members of the machine shown in my said pending application.

The members 25 may be, of course, mounted in any suitable manner for such movements and adjustments as may be deemed necessary. In the present illustrative disclosure, they are shown as being adjustably carried by supports or holders 40. The opposed faces of the holders have horizontally extending dove-tailed gibs 41, and the members 25 have V-shaped or dove-tailed grooves slidably receiving these gibs. The members 25 may be adjusted on the holders by turning the screws 42.

The numeral 45 designates a transversely extending guide rail which is preferably removably secured to the base 10 in order that this rail, together with the parts carried thereby, may be removed when the frame is to be used in connection with other devices. The central blade or bending tool 23 is removably carried by a stud 46. Adjustably mounted on the rail to each side of the stud 46 is a slide 47 which may be clamped in adjusted positions on the rail by clamping screws 48. Carried by each slide is a vertical post 49 on which the holders 40 are mounted for vertical adjustment but held against rotary movement. The holders rest upon nuts 50 which are threaded onto the posts. The holders are held against rotation with respect to the posts by keys or pins 51 working in grooves or spline-ways 52.

The operation of the machine is briefly as follows: The size and shape of the clasp to be made having been determined by an examination of the tooth to which it is to be applied, the holders 40, together with the members 25 carried thereby, may be vertically adjusted by turning the nuts 50. The piece of wire is placed in the machine so that it extends through the slots 34 and cross-wise of the blades 20 and 23.

Then the lever 16 is operated so as to move the plunger 13 downwardly, thus bringing the lower ends of the prongs 20 into engagement with the wire. Normally, these prongs are sprung inwardly so that the distance between them is less than the thickness of the blade 23 plus two diameters of the wire. When the prongs are brought into engagement with the wire, however, the prongs will spread apart, as shown in Fig. 1, so that the bend in the wire over the upper edge of the blade 23 is not initially made too sharp, and shearing of the wire at the top of this blade is avoided. Upon continued movement downwardly of the prongs 20, they will, owing to their own resiliency, spring towards each other, thereby drawing the wire, which is between these prongs and the central blade 23, closely against the latter blade, as is shown by broken lines in Fig. 1 and by full lines in Fig. 2. The central U-shaped portion of the clasp is thus formed, and the reverse bends B are partially formed. The holders 40 are now moved towards each other, as shown in Fig. 4, so that the opposed faces 26 of the members 25 will engage the portions of the wire between these faces and the prongs 20 and bring those portions into substantial parallelism with the legs A. That is to say, the reverse bends B are completed and the legs D are brought into proper relation to the legs A. The ends of the wire are then bent into the angles or corners formed by the bending surfaces 32 and 35 (in case larger arms C are desired) so as to give the arms C of the clasp the proper shape. If a smaller clasp is to be made, the bending surfaces 33 and 36 may be used for bending the arms C.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the in-

vention which, as a matter of language, might be said to fall therebetween.

I claim as my invention:

1. In a dental machine of the character described, a member over which the work is to be bent, and a pair of blades opposed to said member and adapted to bend the work thereover, said blades being arranged to automatically move away from each other when brought into engagement with the work and to move towards each other after an initial bend has been formed in the work, said arms being resiliently urged towards each other at all times.

2. In a dental machine of the character described, a member over which the work is to be bent into U form, a pair of blades opposed to said member and adapted to straddle the same and bend the work thereover, and resilient means normally urging said blades towards each other.

3. In a dental machine of the character described, a member over which the work is adapted to be bent, and a pair of resilient blades opposed to said member and adapted to straddle the same, said blades being urged by their own resiliency towards each other throughout the bending operation.

4. In a dental machine of the character described, a central blade over which the work is adapted to be bent, a fork having prongs parallel to and adapted to straddle said blade, said prongs being resilient, and means for supporting said fork for movement into and out of straddling relation to said blade.

5. In a dental machine of the character described, a member over which the work is adapted to be bent, a rest to each side of said member, and a pair of blades opposed to said member and adapted to bend the work thereover, said blades being arranged to automatically move away from each other when brought into engagement with the work and to move towards each other after an initial bend has been formed in the work.

6. In a dental machine of the character described, a central blade over which the work is adapted to be bent, a rest to each side of said blade, and a pair of resilient blades opposed to said central blade and adapted to straddle the same.

7. In a dental machine of the character described, a central blade over which the work is adapted to be bent, a rest mounted to each side of said central blade for adjustment longitudinally thereof, and a fork having a pair of prongs opposed to said central blade and adapted to straddle the same.

8. In a dental machine of the character described, a central blade over which the work is to be bent, a pair of rests straddling said central blade, said rests being supported for adjustment longitudinally and transversely of said central blade, and a pair of resilient blades opposed to said central blade and adapted to straddle the same between said rests.

9. In a dental machine of the character described, a central die element, a pair of elements to opposite sides thereof and mounted for vertical and transverse adjustments relative thereto, and a member opposed to said central die element and mounted for movement to and from the space between said side elements.

10. In a dental machine of the character described, a central die element, a pair of side elements to opposite sides of said central die element, and an element opposed to said central die element and adapted to move into and out of the space between said side elements, said side elements being mounted for vertical adjustment for movement towards and away from said central die element and for adjustment on a line normal to the line of vertical adjustment and transverse movement.

11. In a dental machine of the character described, a central blade over which the work is adapted to be bent, a pair of rests one to each side of said central blade, said rests having forming surfaces about which the arms of the clasp are adapted to be formed, and a fork having prongs parallel to and adapted to straddle said central blade.

12. In a dental machine of the character described, a central blade over which the work is adapted to be bent, a member to each side of said blade; each of said members having a side face parallel and opposed to a side face of said blade, a portion adapted to support the work, and bending surfaces; and a pair of resilient blades opposed to said central blade and adapted to straddle the same.

JOHN M. CRAIGO.