

Feb. 4, 1936.

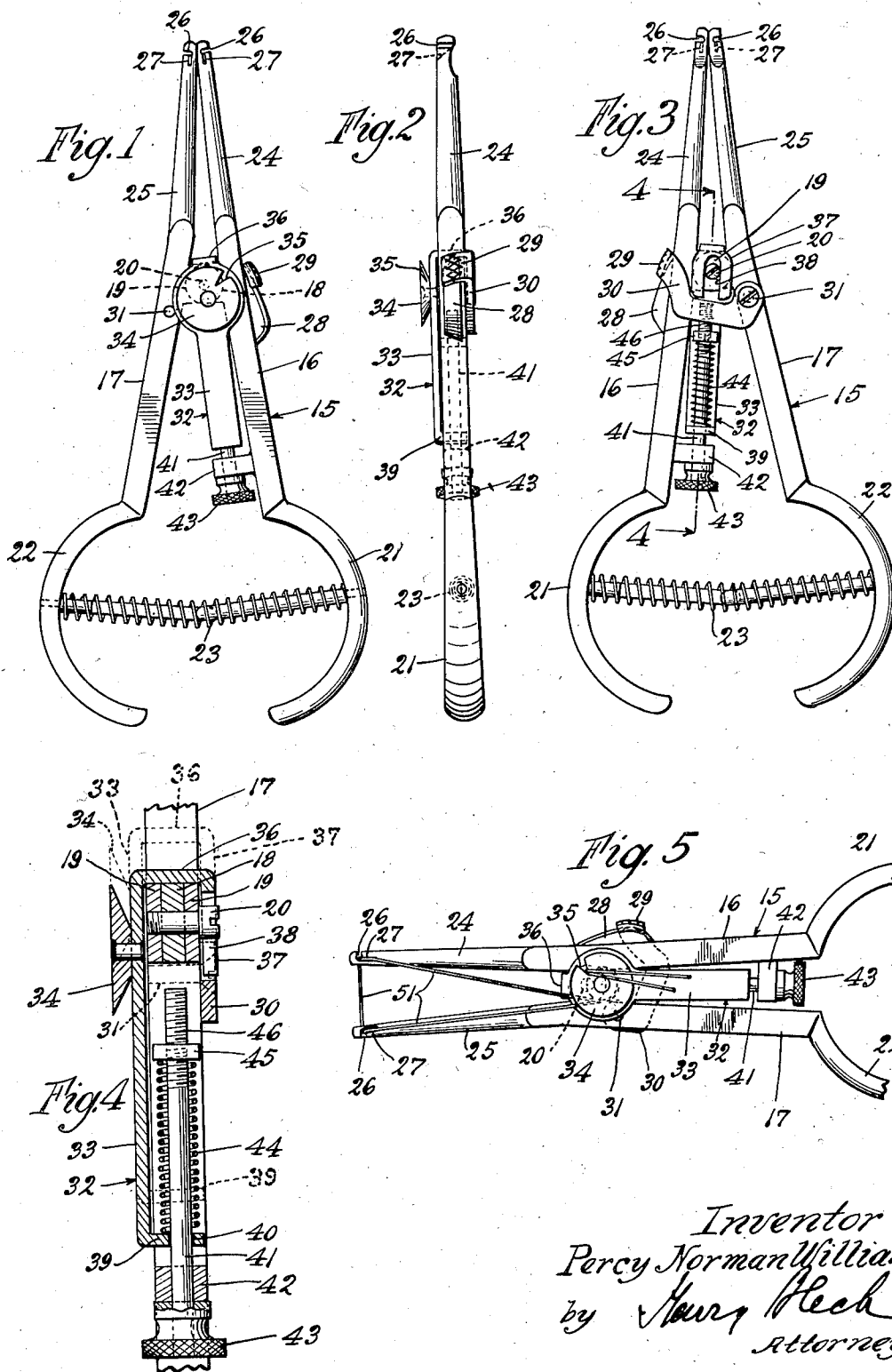
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2,029,904

ORTHODONTIC APPLIANCE

Filed Oct. 10, 1934

2 Sheets-Sheet 1



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Fig. 6

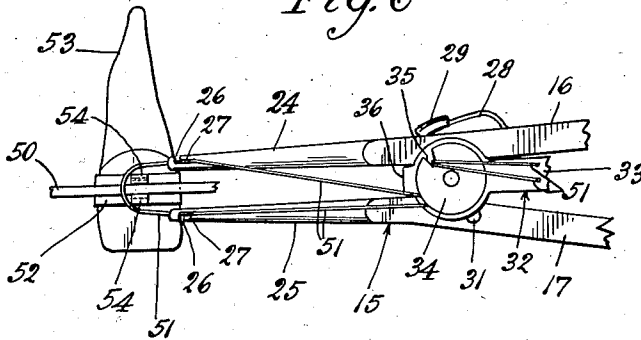


Fig. 7

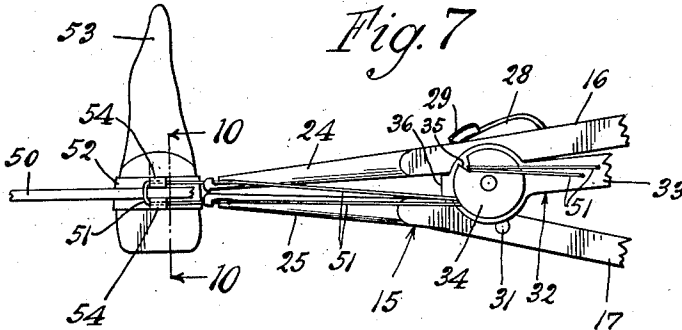


Fig. 10

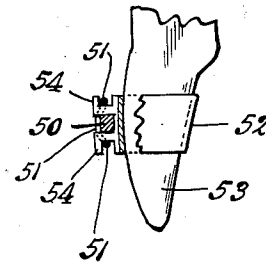


Fig. 8

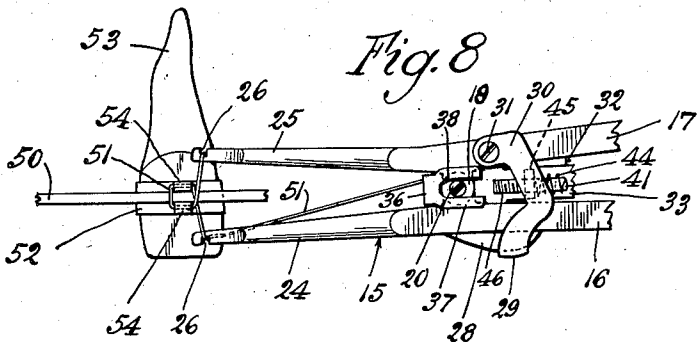
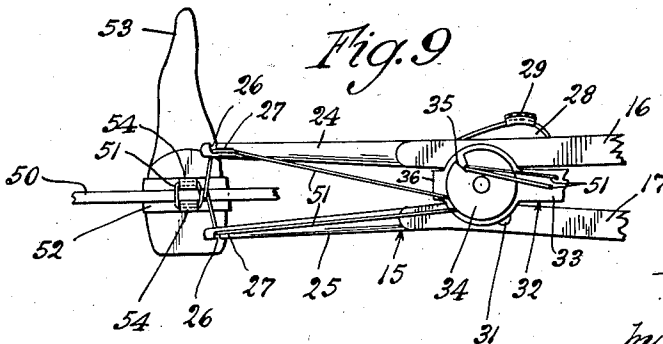


Fig. 9



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UNITED STATES PATENT OFFICE

2,029,904

ORTHODONTIC APPLIANCE

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6 Claims. (Cl. 32-66)

My invention relates to an orthodontic appliance known as ligature tension pliers, provided for attaching ligature wires to labial arch wires employed in dentistry for the correction of malposition of teeth.

My invention has as an object to provide means by which ligature wires may be bent and formed so it may be easily applied to a tooth or to a tie bracket band.

A further object is to provide means by which teeth may be attached to labial arch wires with ligature wires with a definite predetermined tension on said ligature wires during application, particularly at places difficult to reach.

A still further object aims at the provision of adjusting means whereby the tension of the ligature wires may be selectively varied.

In dentistry the common practice is to apply ligatures by hand, which is arduous and fatiguing, and results in uncertain tension on the teeth, as it is unlikely that two ligature wires can be applied by hand with exactly the same tension.

With these and other equally important objects in view which will become apparent from a perusal of the invention, the latter comprising means described in the following specification, particularly pointed out in the claims forming a part thereof and illustrated in the accompanying drawings, in which,

Fig. 1 is a side elevation of my device.

Fig. 2 is an end elevation.

Fig. 3 is a view looking towards the rear of the device as shown in Fig. 1.

Fig. 4 is an enlarged section taken along the line 4-4 of Fig. 3.

Fig. 5 is a fragmentary side elevation illustrating the device in the locked or open position with the ligature wire in position.

Figs. 6 to 9 illustrate different steps of applying a ligature wire about a tie bracket in a tooth and securing it to a labial arch wire, and

Fig. 10 is an enlarged section taken along the line 10-10 of Fig. 7.

Like parts are indicated by like symbols throughout the specification and drawings.

Referring to the drawings, my orthodontic appliance, known as tension pliers, generally designated by 15 include the opposed tongs 16 and 17, provided with lugs 18 and 19 for a pivot pin 20. The tongs are formed at one end with handle portions 21, 22 normally held in the position illustrated in Fig. 1 by any suitable spring means 23. The opposite ends terminate in preferably tapered shanks 24 and 25 each of which is provided at its extremity with a slot 26 cooperating

with an inclined groove 27 at right angles thereto.

Any suitable locking means may be employed for holding the tapered shanks 24, 25 of the tension pliers against the comparison of the spring 23 in opened position, referring to Figs. 8 and 9.

As an example I have illustrated a cam member 28 formed upon the tong 16, adapted to be engaged by an offset portion 29 of a locking lever 30, pivoted as at 31 to the tong 17.

Mounted for longitudinal movement on the the pliers is a bracket member, generally designated by 32, which may include a central portion 33, to which is secured a ligature bobbin 34 provided with a triangular slot 35 an offset portion 36 normally resting upon the lugs 18, 19, and a slotted end member 37 embracing said lugs. The slot 38, engaging the protruding head of the pivot pin 20, serves as a guide for the bracket member 32. The bracket member is further provided with a lug 39 which is apertured as at 40 to receive an adjusting screw 41 which in turn is held for rotation in an apertured lug 42 on the tong 16 by a knurled controlling knob 43. Surrounding the adjusting screw 41 is a coil spring 44 compressed between the lug 40 of the bobbin bracket and an abutment nut 45, screw threaded upon the screw threaded end 46 of the adjusting screw 41.

Referring to Figs. 5 to 9, I have illustrated the steps necessary for attaching teeth to an orthodontic appliance known as a labial arch wire by means of a ligature wire 51. I may either pass the wire 51 around a tooth and apply it directly to the labial arch wire 50, or I may employ any suitable tie bracket 52 fastened to a tooth 53. The tie brackets may be provided with any suitable slotted wings 54 adapted to receive the arch wire 50, clearly shown in Fig. 10.

In order to attach a tooth with a tie bracket 52 to an arch wire, the pliers are locked in opened position by means of the locking lever 30; a ligature wire is threaded in the slots 26 and 27 and the loose ends are wound about the bobbin 34 and threaded through the triangular slot 35 as illustrated in Fig. 5. It will be noted (see Fig. 4) that the face of the bobbin 34 adjacent the bracket 32 is conical to attain a binding effect for the ligature wire to prevent slipping.

The locking lever is now released and the tension pliers are permitted partly to be closed by the spring means 23, which causes the ligature wire to form a loop for applying it over the tie bracket wings 54 (see Fig. 6). The loop is completed by closing of the pliers as shown in Fig. 7. The operator then gives the pliers a half turn and opens and locks the pliers in opened position

which brings into play the tension means associated with the bobbin, about which the ligature wire is secured.

The spring 44 permits longitudinal movement of the bobbin bracket 32. The tension of the ligature wire may be varied as demanded by means of the adjusting screw 41 and once set, a definite predetermined tension on the ligature wire is provided for each succeeding tooth to be attached to the labial arch wire. The knot of the ligature wire is completed by an additional half turn of the pliers, shown in Fig. 9. The ligature wire is then released from the bobbin and the loose ends may be cut off.

It will be understood that my tension pliers are likewise effective for rotating teeth, as now practiced in dentistry, by employment of any suitable band attached to each tooth, including anchoring means for the ligature wire.

While the drawings show a preferred embodiment of the invention, numerous changes and alterations may be made without departing from the purview of the invention. I therefore, do not limit myself to details of construction and arrangement as shown, but claim my invention as broadly as the state of the art permits.

I claim:

1. In combination with orthodontic pliers for applying and locking wire ligatures, an angular notch at the extremity of each beak of said pliers for supporting an intermediate portion of a ligature wire, fastening means for the ends of said ligature wire, and tensioning means supporting said fastening means, said tensioning means being effective during application of said ligature wire.

2. In combination with orthodontic pliers for applying and locking wire ligatures, an angular notch at the extremity of each beak of said pliers for supporting an intermediate portion of a ligature wire, fastening means for the ends of said ligature wire, and means supporting said fastening means to permit a predetermined tension of

said ligature wire to be obtained, said tension means being effective during application of said ligature wire.

3. In combination with orthodontic pliers for applying said locking wire ligatures, means at the extremity of each beak of said pliers adapted to support an intermediate portion of a ligature wire, fastening means for the ends of said ligature wire, tension means supporting said fastening means, said tension means being effective during application of said ligature wire, and adjusting means for said tension means for selectively varying the tension for said ligature wire.

4. In combination with orthodontic pliers for applying and locking wire ligatures, spring means provided for normally closing the beaks of said pliers, means at the extremity of each beak of said pliers adapted to support an intermediate portion of a ligature wire, fastening means for the ends of said ligature wire, tension means supporting said fastening means, said tension means being effective during application of said ligature wires, and means for holding the beaks of said pliers in opened position.

5. In combination with orthodontic pliers for applying and locking wire ligatures, spring means for normally closing the beaks of said pliers, a holder on said pliers for the ends of a ligature wire, means at the end of each plier beak to support an intermediate portion of said ligature wire, and means for adjusting said holder to vary the tension of said ligature wire.

6. An orthodontic plier, including a pair of tongs secured together for pivotal movement, a spring between the handle ends of said tongs to normally close the operative tong ends, said operative tong ends being notched, a holder adjustably secured to said tongs and securing the ends of a ligature wire being threaded through said tong notches, and means for adjusting said holder to vary the tension of said ligature wire.

PERCY NORMAN WILLIAMS.