

July 27, 1943.

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2,325,300

FRACTURE APPLIANCE

Filed Nov. 2, 1942

3 Sheets-Sheet 1

Fig. 1.

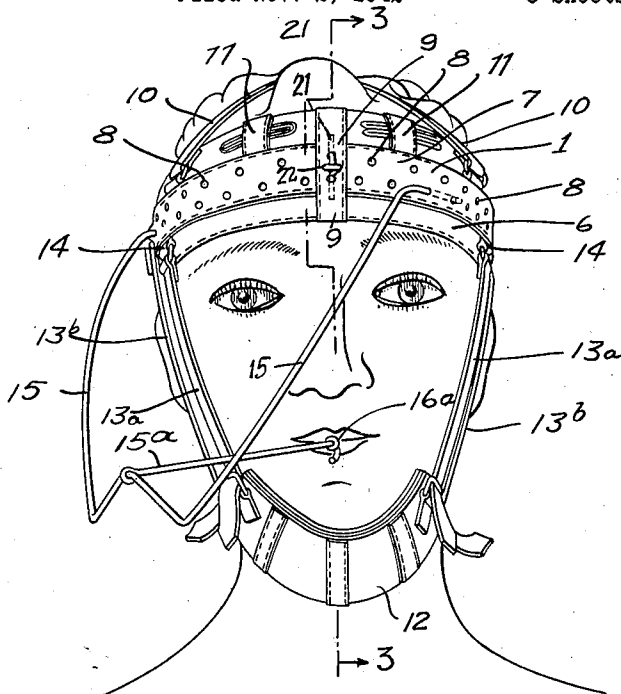
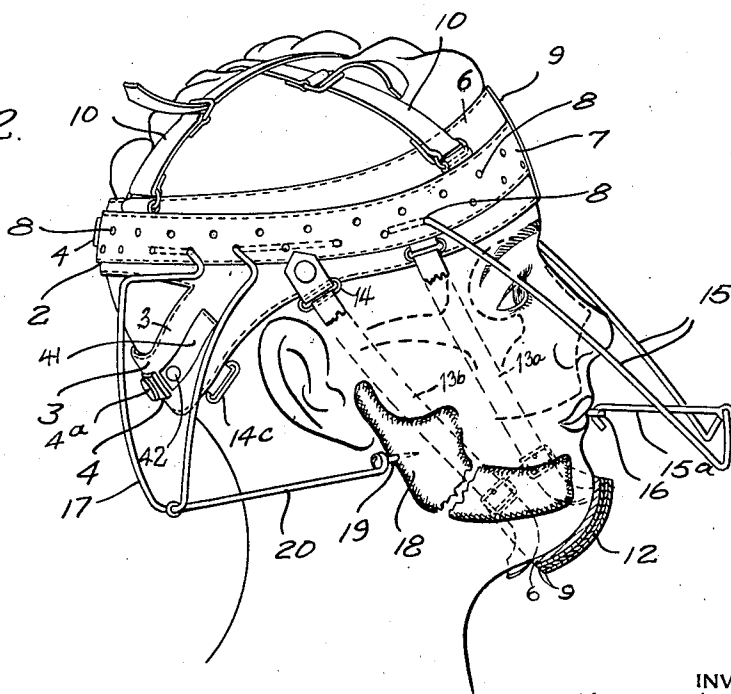


Fig. 2.



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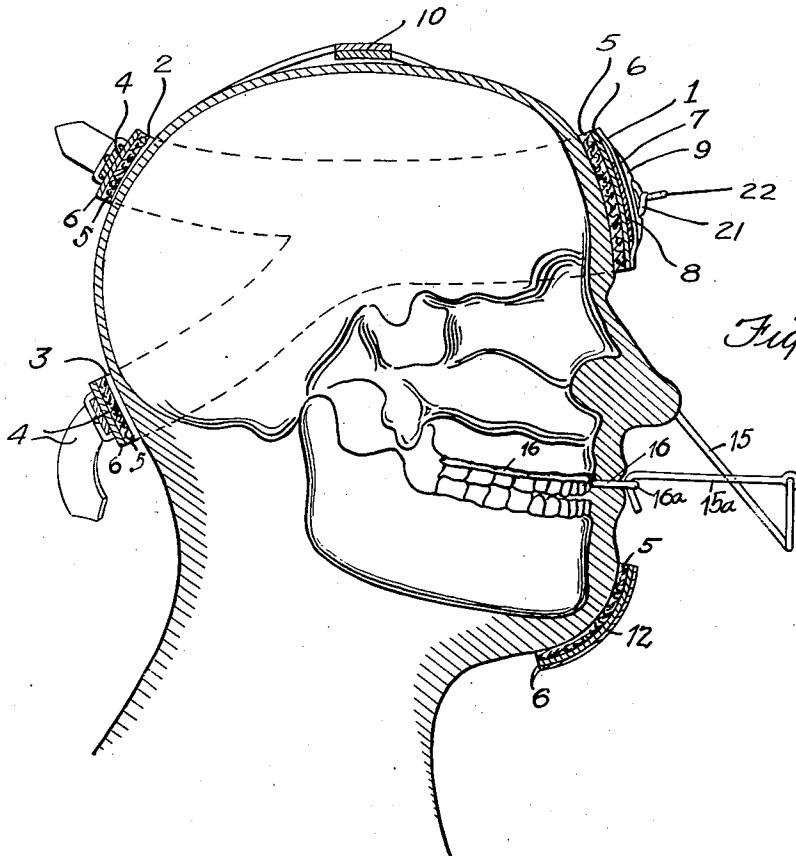


Fig. 3.

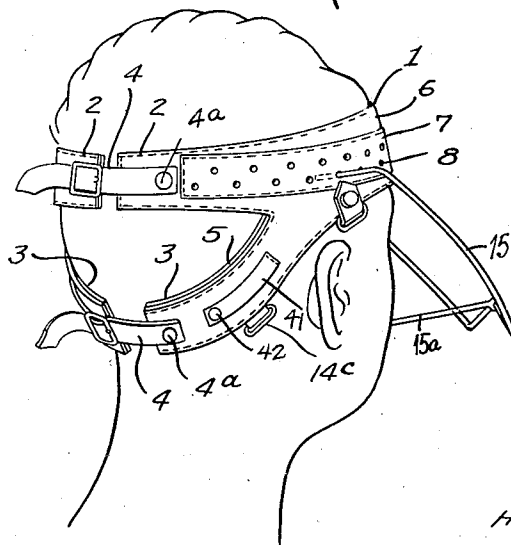


Fig. 4.

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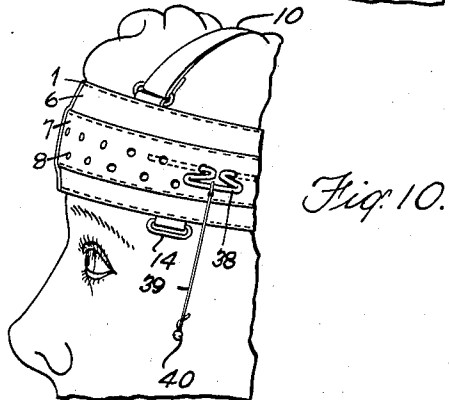
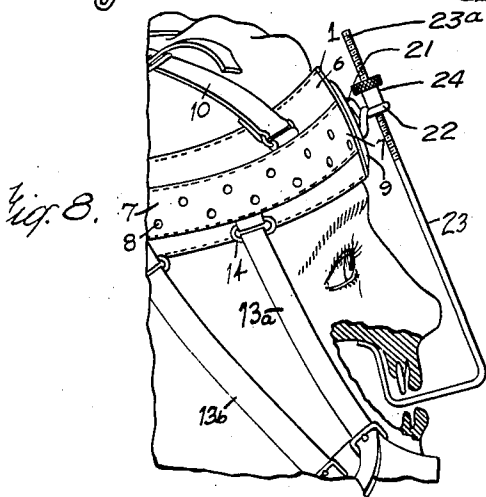
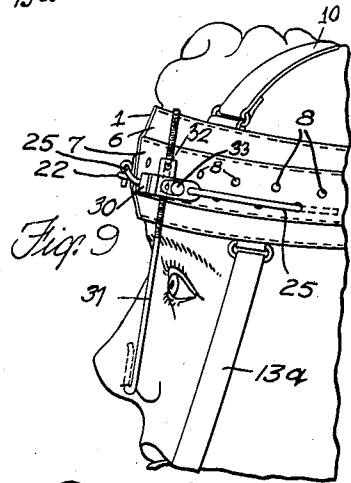
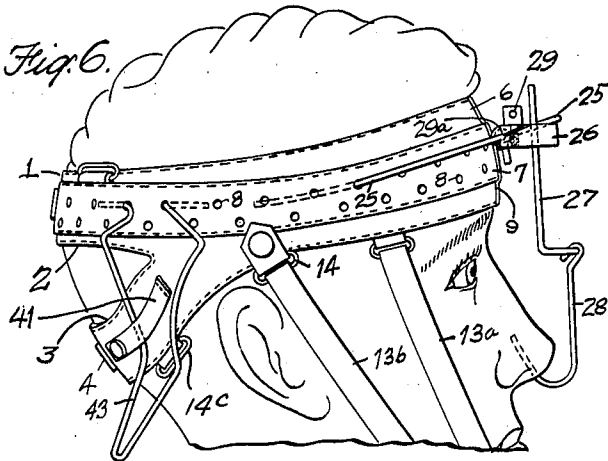
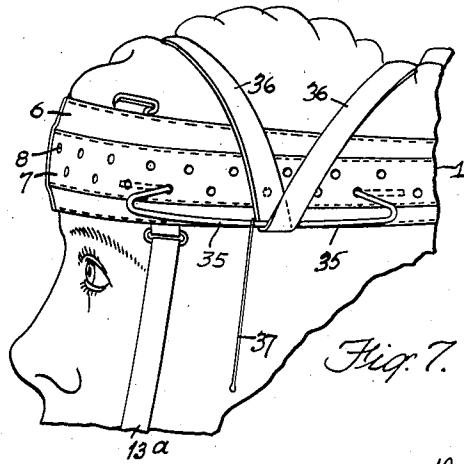
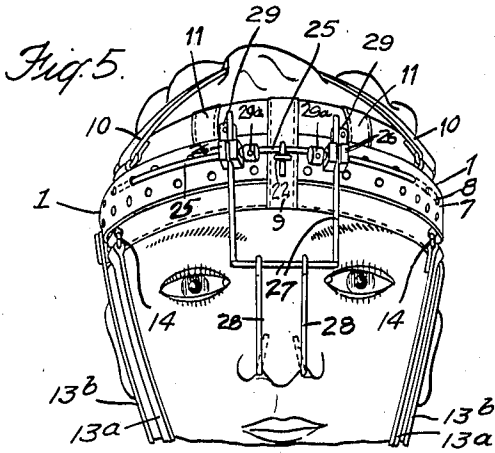
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3 Sheets-Sheet 3



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2,325,300

FRACTURE APPLIANCE

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Application November 2, 1942, Serial No. 464,138

6 Claims. (Cl. 128—87)

This invention relates to an appliance for use in the treatment of malformations, dislocations, fractures and diseases of the jaws, as well as bone structures contiguous thereto.

An important object of the present invention is to provide an appliance of the character alluded to, which is simple in construction, permits of a wide range of adjustment and usage, enables a ready shifting of the accessory appended elements customarily employed in conjunction with apparatus of this character, and is capable of such diverse and numerous applications as to substantially preclude the use of other appliances heretofore employed.

More specifically, the present invention involves a headband adapted by very simple means and equally simple manipulation, to engage or receive in any one of a plurality of positions therealong, supporting, traction, retention or compression wires or implements, and other instrumentalities usually availed of in the treatment of fractures, dislocations, malformations, etc., of the bone structures above referred to.

For instance, fractures of the mandible and maxilla are of common occurrence, and frequently accidents producing such fractures also produce fractures, impactions, etc., of the palate, malar and nasal bones. Furthermore, these fractures may be simple, singular, multiple, bilateral, compound or comminuted. They may be transverse, vertical, or oblique; or the parts may be separated by crushing, or there may be loss of bone due to the incursion of bony necrosis, and so on. It will be apparent that the number and diversity of devices and instrumentalities required to handle such variegated pathological and surgical states would ordinarily be imposing, to say the least.

It is the commendable virtue of my appliance that it provides an instrumentality for simply coping with a large number of such conditions which have heretofore required sometimes cumbersome, if not multiple, apparatus, as well as requiring a very expert technique.

It will be apparent, therefore, that an appliance so amenable to ready adaptability under such diverse complications is of the utmost professional utility, and it is this very adaptability and versatility that is stressed herein as of the essence of the present invention.

For example, in any case where fractures or separations, etc., occur, it is the common procedure to resort to what is known as interdental or interdental wiring, or to apply a splint made of various materials, or to employ bandages. In

the case of wiring, a wire is looped around one or more teeth on each side of the fracture as well as around one or more teeth of the opposite jaw to bring the parts into proper positive occlusion. Where there is displacement of a fragment or part of the jaw, laterally, anteriorly, or posteriorly, or overriding, it is the practice to first endeavor to reset the so-displaced part into its normal position, and apply fixation in the manner above described. Interdental wiring is only one of the means employed for "splinting" the fractured member; casting, ligation and other means for bringing the parts into alignment being employed, according to the necessities of the case. Interdental wiring frequently is not enough—traction, pressure, or whatever, must be applied in order to assure proper occlusal apposition between the teeth of the upper and lower jaws; hence, the upper and lower jaws are usually wired together, as by interdental wiring with traction, etc. But this traction is ordinarily no simple business; so where interdental wiring is employed auxiliary to external traction, a loop is twisted in the interdental wiring and made to project through the mouth in order that it may be connected to a suitable traction device. Such traction may be anterior (forward), lateral, or posterior in character, depending on the direction of pull of the traction producing device.

It is of the essence of my invention that the proper degree and direction of traction (support, retention or pressure) may be effected, without change in structure of my appliance, as will be presently illustrated.

In the accompanying drawings, my appliance is shown, both in detail construction, and as applied to the correction or treatment of various bone structures of the face.

Fig. 1 is a front view of my device arranged to effect lateral traction on the maxilla or mandible, as the case may be, with the chin support in position.

Fig. 2 is a side view of Fig. 1, showing in addition a latero-posteriorly disposed traction wire.

Fig. 3 is a partially pseudo-sagittal section of a human skull with my appliance in sectional view on the line 3—3 of Fig. 1.

Fig. 4 is a three-quarter rear view of my device in which the chin and head straps have been dispensed with.

Fig. 5 is a front upper three-quarter view showing my headband with chin straps attached, and carrying a slidable bracket or yoke supporting attachments for correcting nasal deformities.

Fig. 6 is a side view of Fig. 5 showing in addi-

tion, a latero-posterior traction wire or device.

Fig. 7 is a side view of my headband, in part, with a suitable attachment supported by overhead tape or strap, which attachment supports tension or traction wire, elastic, etc., for exerting traction or tension of the maxillae or malar bone or other structures.

Fig. 8 is a partial side view of my headband with attachment for use in the support, retention or alignment of the palate.

Fig. 9 is a partial side view of my headband with attachment for correcting nasal deformities and the like.

Fig. 10 is a modification of Fig. 7, and showing a smaller attachment for use closer to the face, and used similarly to Fig. 7.

Throughout the drawings, like numerals indicate like parts.

My device comprises a headband 1 not quite entirely encircling the head. At the rear, the headband is bifurcated at both ends, the upper extensions 2, 2, embracing the back of the head on a line, approximately, with the front portion of the headband, or the back part of the crown of the head, while the lower extensions 3, 3, slant downwardly and underneath the back or occiput of the head. Adjustable straps 4, 4, pivotally riveted at one end as at 4a, unite the respective extensions to each other, and enable the headband to be adjusted to a wide range of sizes and variable inclinations of extension 3, 3. The inside of the headband is lined with felt, cotton, or other soft absorbent material 5, which is preferably overlaid by a leather band 6, stitched or otherwise attached to the underlying felt lining 5. Stitched or otherwise attached to said band 6 is a perforated, preferably leather, band 7 which extends around the sides and front of the headband proper. The perforations 8, of said band 7, are in two rows and extend preferably around the entire length of the band. A leather strip 9 is also stitched or otherwise attached to the front of the headband, extending vertically above and between the eyes, the perforations therein being located one above the other.

In order more securely to position or stabilize the headband on the head, straps 10, are provided (see Figs. 1, 2, 3, 5, 7, 8, 9 and 10, for example). In order to provide for further possible implementation of the device, two pieces of leather 11, are stitched to the headband in such a way as to provide means through which wires, ligature, tape or the like may be passed and thus stored for ready access (see particularly Figs. 1 and 5).

A chin cup 12 is also provided for supporting the mandible or lower jaw and is connected to the headband by straps 13a, 13b, respectively, two on each side. The posterior straps 13b may be attached at their upper ends to buckles or loops 14, which are in turn pivotally attached to the headband, so as to enable the said rear straps 13b, to swivel and thereby permit oblique or vertical support. There are also provided loops 14c to which the straps 13b may be attached, if so desired.

It will be seen from the several figures that the prime purpose of the perforated band 7 is to provide a convenient instrumentality for receiving, engaging or accommodating the laterally bent ends of traction wire 15, and other similarly bent attachments, which may be inserted into any pair of holes in the series of perforations 8, 8, in said band. The traction wire 15 may be readily shifted from one side to the other in

order to provide right, left, or directly forward (anterior) traction. The member 15a extending from the traction wire 15 to the loop 16a of the interdental wiring 16 may consist of a rubber band or wire. If the member 15a be a rod, obviously the traction wire 15 may also be adjusted for compression or retention.

In Fig. 2, there is shown another traction wire 17, the ends of which are disposed in perforations 8, 8, toward the rear of the band 7. Said device 17 also extends downwardly. The function thereof, as clearly illustrated in said Fig. 2, is to exert traction on the posterior portion 18 of the mandible, fractured as shown, substantially across the angle of that bone, or for any fracture in the mandible or maxilla requiring backward traction. A screw 19 is shown as temporarily embedded in the bone structure of fragment 18, which screw is connected by a traction, tie wire, rod or rubber band 20, to the traction device 17. This latter arrangement is usually employed where there has been what is known as an overriding fracture, traction being required to be placed on the posterior fragment to maintain or bring the latter into alignment with the main body of the mandible. For this purpose also a hole may be drilled through the bone and a wire passed through and connected to the traction bar 17.

It should be noted that the traction wire which I employ is preferably of such character as to be readily bent into desired form or shape and yet resilient enough to apply the necessary degree of traction or compression as and when required.

In the vertical perforations of the strip 9 in the fore-part of the headband (see Figs. 1, 3, 5 and 8) are adapted to be inserted, as shown in Fig. 3 particularly, the two ends of a wire 21 which has been formed with a loop 22 by twisting the said wire. This loop 22 may be used for attachment of either a nasal or a palatal appliance.

The ends of wire 21 are inserted in the vertically spaced-apart apertures in the strip 9, and passing through the loop 22 is a rod 23, the lower end of which is bent inwardly and upwardly and then rearwardly, so as to provide a support for the palate. The upper portion of the member 23 is threaded as shown at 23a. A knurled, internally threaded collar 24 is engaged to ride up and down the threaded portion of member 23 so as to adjust the necessary tension or traction on the palatal structure.

Referring now more particularly to Figs. 5 and 6: there is disclosed an arcuately formed, horizontally-disposed rod 25, the ends of which are disposed in apertures 8, in the band 7. Along the rod 25 ride perforated bracket members 26, adapted to receive severally the arms of a U-shaped yoke or member 27. Depending from, but attached to said U-shaped member, are two hooked members 28, adapted to enter the nasal orifices, so that when the yoke member 27 is properly raised or lowered, the essential uplift or traction or tension will be applied. When this position has been determined, set screws 29, are tightened. Lateral movement is prevented by tightening set screws 29a.

In Fig. 9 only a single bracket 30 is shown and a single rod 31 for disposition in the nasal orifice. Set screws 32 and 33 are provided for maintaining the threaded rod 31 securely in place.

Referring to Fig. 7: the headband may be employed to receive a horizontally disposed metal loop or clip 35, the ends of which are disposed

in apertures 3, of band 7. This arrangement, as will be seen, affords a convenient anchorage for a cross-over bandage 35 or tape in order to stabilize the clip 35 to provide a convenient rigidly held point for attaching wire, rod or elastic for traction of maxilla or malar bone or other structures.

In Fig. 10, a somewhat smaller loop or clip 33 may be attached to the band 7 and a rubber or other band 39 may be connected through point 40 to the loop 33.

In all instances, particularly as illustrated in Fig. 4, the straps 4, are preferably pivotally attached, as indicated at 4a.

In Figs. 2, 4 and 6, respectively, the bifurcated portion 3 is provided with a leather strip 41, one end of which may be stitched or otherwise attached to the band beneath, while the other end may be attached preferably by means of a snap-fastener 4a, so as to facilitate the reception of an arm of traction wire 43, as clearly shown in Fig. 6.

It is quite apparent from the above exhaustive disclosure that my device is susceptible of use in divers connections which will readily suggest themselves to oral surgeons. The numerous applications disclosed are intended to suggest to the art the manifold possibilities of the foregoing apparatus. Other applications will readily occur to those operating in the field, and having indicated them, applicant proceeds to claim what he deems to be his invention. Before doing so, applicant wishes to point out that the most satisfactory material out of which to make his headband consists of a base layer of felt, with successive layers of leather, overlaid; but applicant has no intention of restricting himself to these materials, since obviously other materials or fabrics may be used as equivalents.

Having thus described my invention, what I claim is:

1. An appliance for use in the treatment of fractures, malformations, etc., of the jaws and

contiguous bone structures, comprising a headband having an underlying band and an overlying band having a series of perforations therein through which the ends of a wire are adapted to be inserted and between which bands said ends are adapted to be maintained.

2. An appliance for use in the treatment of fractures, malformations, etc., of the jaws and contiguous bone structures, comprising a headband having an underlying band of leather and an overlying band of leather having a series of perforations therein, through which the ends of a wire are adapted to be inserted and between which bands said ends are adapted to be maintained.

3. An appliance for use in the treatment of fractures and malformations, etc., of the jaws and contiguous bone structures, comprising a headband having an underlying band and a perforated overlying band, and a device having its ends passing through a pair of said perforations and disposed between said overlapping bands.

4. An appliance for use in the treatment of fractures and malformations, etc., of the jaw and contiguous bone structures, comprising a headband having an underlying leather band and a perforated overlying leather band, and traction and retention wires and appliances having the ends passing through said perforations and accommodated between said bands, with supplemental attachments, contained on or attached to said wire.

5. An appliance for use in oral, plastic or repair surgery comprising a headband having a medial strip provided with vertically arranged perforations.

6. An appliance for use in oral, plastic or repair surgery comprising a headband having a medial strip provided with vertically arranged perforations, and a looped wire having its ends disposed in said perforations.

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