Nov. 16, 1948. J. L. PRESTON 2,453,934

SURGICAL APPLIANCE FOR TREATING JAW AND OTHER FACIAL BONE FRACTURES

Filed Jan. 7, 1946 2 Sheets-Sheet 1

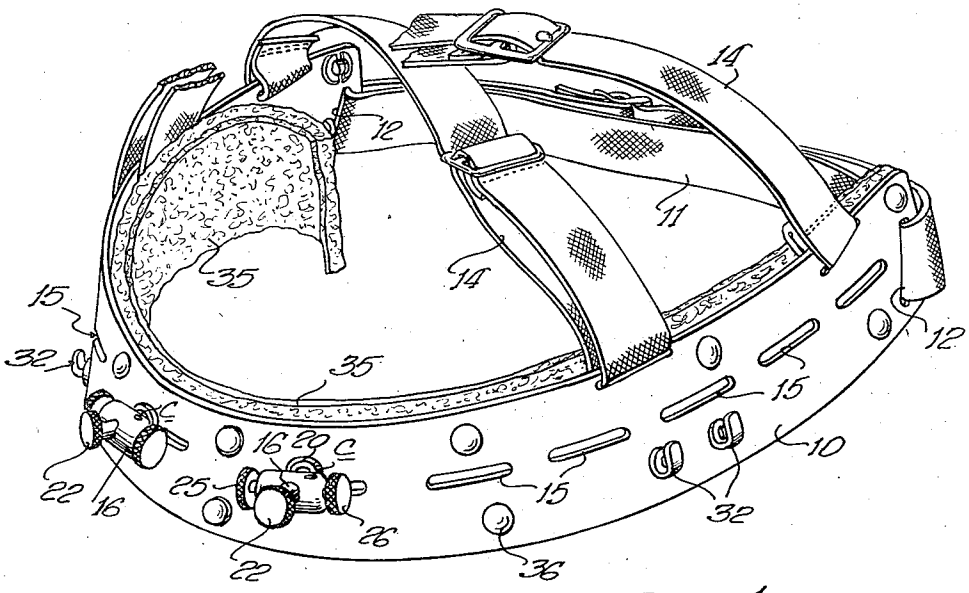


Fig. 1.

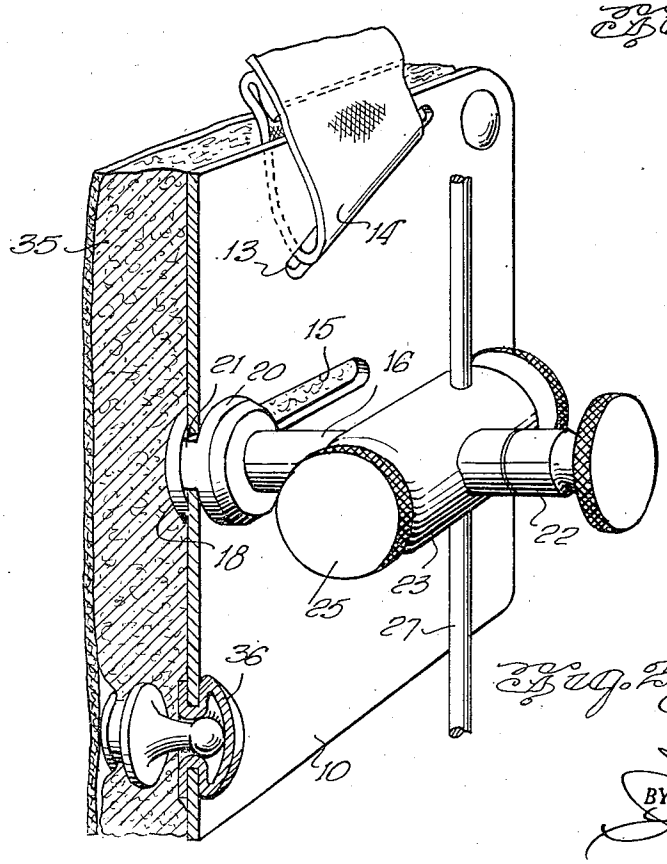


Fig. 2.

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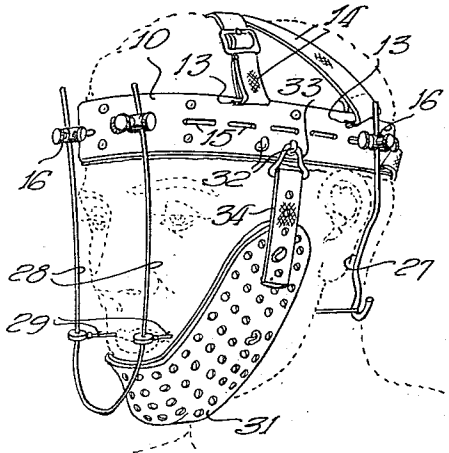


Fig. 3.

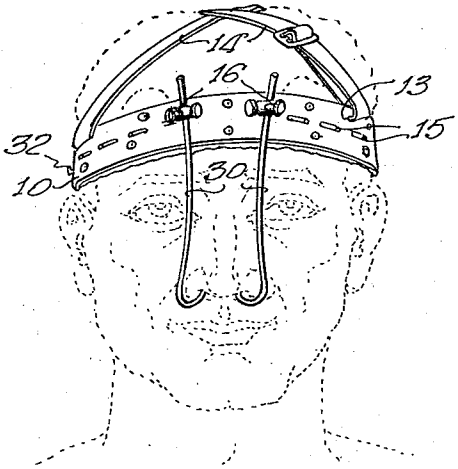
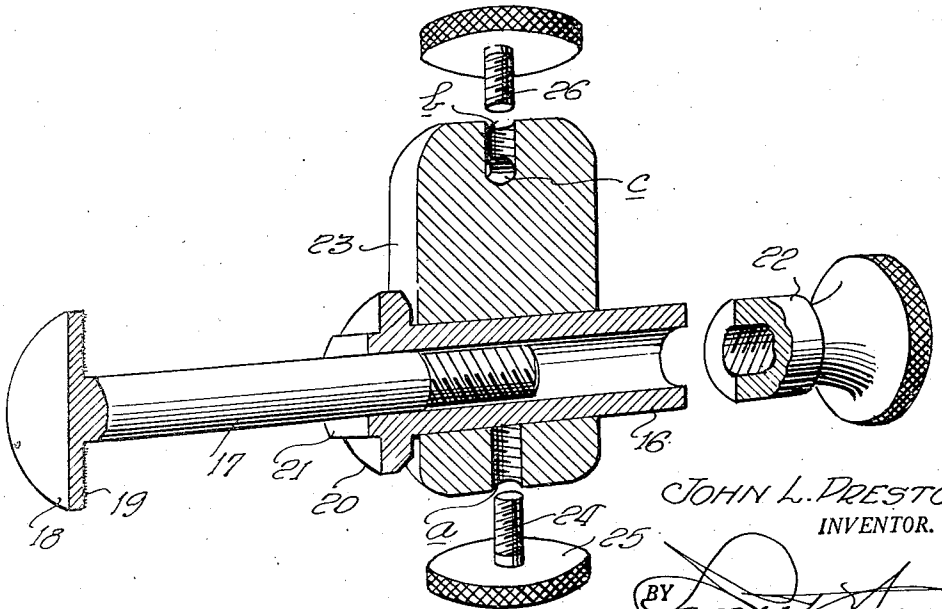


Fig. 4.

Fig. 5.



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SURGICAL APPLIANCE FOR TREATING JAW AND OTHER FACIAL BONE FRACTURES

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Application January 7, 1946, Serial No. 639,511

5 Claims. (Cl. 128—87)

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This invention relates to surgical appliances for the treatment of fractures of the jaws or other facial bones and more particularly to adjustable head gear by which various traction rods and other appurtenances may be supported and adjusted.

The principal object of the invention is to provide an adjustable head mounting for the hooks, wires and other attachments for treating facial bone fractures, the said mounting being adapted to supplant the practice of applying to the patient's head a cap of plaster of Paris in which are embedded the devices necessary for the support and traction in treating certain types of jaw fractures. These plaster caps are ill ventilated and subject the patient to much discomfort.

Another object of the invention is to provide an adjustable head gear or mounting which is well ventilated, light in weight and of sufficient strength to adequately sustain all attachments securely and maintain immobilization of the bony fragments in their proper relationship during the healing process.

Still another object of the invention is to provide an adjustable head gear for the purposes set forth, consisting of a mounting band equipped with head straps and in which is detachably mounted a sweat band with suitable provision for protecting the head against inward thrust of the elements carried by the band for sustaining the attachments thereof.

With the foregoing objects as paramount, the invention has further reference to certain features of accomplishment which will become apparent as the description proceeds, taken in connection with the accompanying drawings wherein:

Figure 1 is a perspective view of an adjustable head gear constructed according to the invention showing one end of the liner or sweat band displaced and parts of the head straps torn away.

Figure 2 is a fragmentary perspective view of the band in vertical section.

Figure 3 is a perspective view of the head gear on a patient, showing various attachments mounted thereon including a jaw brace.

Figure 4 is a front elevational view of the head gear as it appears on a patient with an attachment for the treatment of nasal bone fractures, and

Figure 5 is a perspective view, partly in vertical section, showing one of the universal clamps employed for supporting the attachment wires on the band.

Continuing with a more detailed description of the drawing, reference is primarily made to

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Figure 1 wherein numeral 10 denotes a band of metal or plastic, shaped to conform to the natural contour of the head and being circumferentially discontinuous, it terminates below and on each side of the occipital protuberances and its ends are connected by means of an adjustable strap 11, preferably of woven fabric, passing through slots 12, disposed at an angle to the vertical at each end of the band. Thus, ample adjustment of the band to any size head is afforded.

Along the upper border of the band 10 there are four slots 13, two to the side, the foremost on each side being parallel with the border while the rearmost slots are oblique to permit intercrossing of adjustable straps 14, which are retained in these slots, over the crown of the head, for adjustment and support of the head gear.

Intermediate the edges of the band 10 and on each side thereof, a plurality of aligned slots 15 are provided. These slots accommodate metal posts 16, which are anchored in the slots in the manner illustrated in Figures 2 and 5.

The posts are made up of a threaded pin 17 (Fig. 5) having a head 18 whose undersurface is roughened at 19. The post 16 is hollow, to receive the pin 17 and is further provided with a flared base 20 which bears against the outer surface of the band 10. To prevent rotation of the post 16 when secured to the band, the base 20 thereof is formed with a diemetrical rib 21, which is received in a slot 15 of the band 10, as shown in Figure 2. A knurled nut 22 is threaded onto the end of pin 17, clamping the band 10 between the head 18 of the pin 17 and the base 20 of the post 16, prohibiting rotative or longitudinal displacement of the post in relation to the slot 15 in which it is mounted.

Mounted on the post 16 is a body 23, the said post being rotatably disposed in a transverse bore made through the body adjacent one end thereof. Communicating with this body is a threaded opening *a* entering at the end of the body and adapted to receive a set screw 24, having a knurled head 25. In axial alignment with the threaded opening *a* is a similar opening *b* at the opposite end of body 23, which communicates with a transverse bore *c* in the body, at right angles to but of smaller diameter than the bore which receives the post 16. A set screw 26 enters the threaded bore *b* to bear against a wire or rod 27 (Fig. 2) clamping the same firmly against longitudinal or rotative displacement.

The wire or rod 27 as shown in Figure 2 is representative of any of the appliance extension rods shown in Figures 3 and 4, although with the

exception of rod **27** in Figure 3, these bear different characters of reference since they are employed for supporting different appliances.

It is obvious that to firmly grip and support an extension rod in the desired position in relation to the head band **10**, the post **16** is disposed so that the rib **21** on the head **20** thereof is conformably received in a selected slot **15** of the band, whereupon the pin **17** is passed through the post from the inside of the band and the nut **22** is threaded onto the end of the pin. By tightening this nut, the heads of the pin and post are drawn tightly together to securely clamp the band therebetween. A rod of the desired type is then passed through the small bore *b* and the screw **26** is tightened to secure the rod in place. After orientation of the rod to properly dispose or tension the appliance supported thereby, the set screw **24** is tightened to prevent rotative or longitudinal displacement on the post **16** of the body **23**.

It is apparent from the foregoing that the universal clamps described permit easy adjustment to conform to various angulations of the extension rods **27** and at the same time hold them securely in place. By adjustment of the universal clamps to the extension rods various tractions may be provided for in the manner to be presently described.

When the nature of a fracture requires external forward traction, a protractor stirrup rod **28** may be attached anteriorly to two universal clamps, in the manner shown in Figure 3. This stirrup attachment is known as a protractor.

To procure downward and backward traction, an extension rod **27**, referred to previously and as shown in Figures 2 and 3, may be attached to the universal clamps posteriorly. Also, as shown in Figure 3, extension rod or stirrup **28** may, combined with ligature wires **29**, provide for protraction of impacted maxilla.

Depending supporting rods (not shown) may be attached to the universal clamps and adjustably secured at their lower ends to the arms of the well known Kingsley splint for supporting a fractured maxilla. This operation usually follows the protracting process shown in Fig. 3.

A nasal splint may be supported by two stiff extension rods **30**, as exemplified in Figure 4, attached to two universal clamps in the forehead region and extended downwardly in a curved formation that terminates below the tip of the nose.

Extension rods may be angulated to any position where treatment of other facial bones requires special traction and support by attachment to the universal clamps as described.

In Figure 3 also is shown the method of securing a jaw brace **31** to the chin of a patient. Hooks **32** are located adjacent the lower edge of the band **10** on each side and loops **33**, carried by strap **34** on the jaw brace **31**, are received by the hooks.

For the comfort of the patient, a felt padded sweat band **35** (Figs. 1 and 2) is provided and attached to the inner surface of the band **10** by means of fasteners **36**. These fasteners are bradded through the felt lining and attach themselves directly to the counterpart on the inner surface of the head band **10**.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claims is also considered to be within the spirit and intent of the invention.

What is claimed is:

1. In an instrument for the treatment of facial bone fractures, a circumferentially discontinuous head band of resilient material having intercrossing, adjustable supporting straps and further provided with longitudinally aligned slots on each side of its midsection, disposed midway between its edges, accessory rod mountings retained in said slots, said mountings consisting of a threaded pin receivable in a selected slot having a head provided with roughened undersurface, a post mounted on said pin having a head provided with a transverse rib receivable in a slot of said band, the heads of said pin and post opposing said band in clamping relationship, mounted on said post for rotative and longitudinal displacement thereon and receiving and retaining accessory rods, a sweat band in said head band and means releasably retaining said sweat band.

2. An instrument supporting device in the treatment of facial bone fractures including a circumferentially discontinuous band of stiff material having a removable pad coaxially arranged therein, said band further having longitudinally aligned slots therein, intercrossing crown and occipital supporting straps connected to the upper edge and ends of said band respectively, instrument supporting clamps retained in said slots, each consisting of a pin having a head lying within said band, a hollow post axially receiving said pin, and having head providing slot engaging means to hold said post against rotation, and a body frictionally mounted on said post and retaining rods for supporting instruments in relation to said facial bone fractures.

3. In a device for supporting accessory instruments in the treatment of facial bone fractures, a head band, having longitudinally aligned slots therein, a head engaging pad removably mounted in said band, supporting straps connected to said band to embrace the head, accessory instrument supporting means movably mounted on said band, said movably mounted supporting means consisting of a pin extending through a slot in said band having a head disposed within said band and a hollow post embracing said pin and having a head provided with means for non-rotatably engaging said slot, means threaded onto said pin and bearing on said post to hold the heads of said pin and post in clamping relationship with said band, and a universal clamp frictionally retained on said post for securing said accessory instruments in fixed proximity to the facial bone fractures under treatment.

4. A device for supporting accessory instruments in the treatment of jaw and other facial bone fractures, comprising a band of stiff but light material having a removable pad thereon, supporting straps secured in additional slots in said band to embrace the head, said band further having longitudinally aligned slots on each side thereof, a plurality of hollow posts, each having a head provided with a transverse rib lying in a slot of said band, a pin extending through each of said posts having a head lying within said band, means on said pins for clampingly securing the heads of said pins and posts on said band to hold said posts against rotation and longitudinal displacement on said band and adjustable means frictionally held on said posts for immovably supporting an accessory instrument adjacent said facial bone fractures.

5. A device for treating jaw and other facial bone fractures including a head band having adjustable supporting straps and a removable sweat pad, said band further having longitudinally aligned slots on each side thereof, universal clamps mounted in said slots for retaining instrument supporting rods for rotative and longitudinal adjustment, without detachment from said band, to orient instruments in relation to said facial bone fractures, said universal clamps each consisting of a pin having a threaded end, a hollow post embracing said pin, a body transversely bored to receive said post for rotative and longitudinal displacement thereon and further bored at right angles to the first bore for receiving an instrument extension rod, separate means for frictionally clamping said post and rod to

hold the named parts against relative movement, and means for positively securing said universal clamps against displacement on said band.

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