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R. H. A. PALEY ET AL

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SPLINT TENSIONING DEVICE

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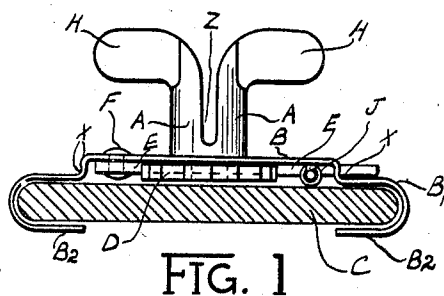


FIG. 1

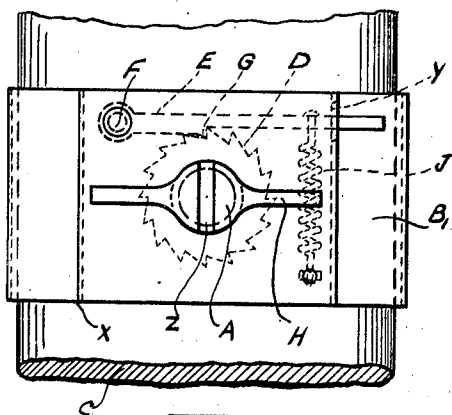


FIG. 2

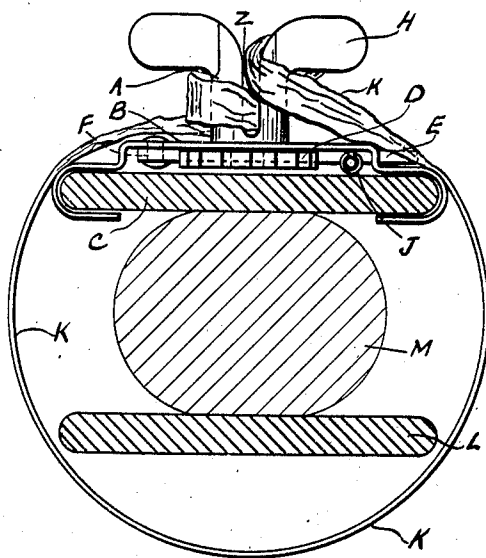


FIG. 3

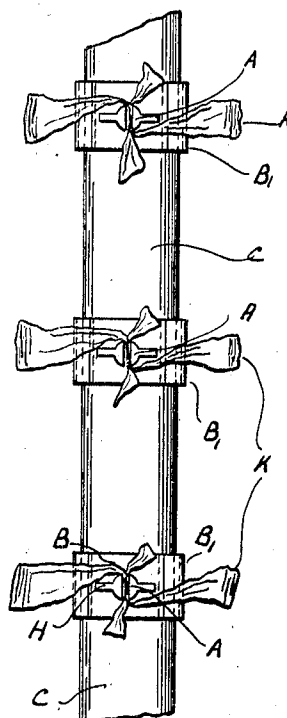


FIG. 4

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SPLINT TENSIONING DEVICE

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7 Claims. (Cl. 128—83)

This invention relates to a method of securing and holding splints in position when used for the temporary securing and supporting of broken or damaged limbs for purposes of setting and the like, and to a device for carrying out such method.

According to the invention the usual flexible elements such as webbing straps and the like used in conjunction with splints, are adapted to be drawn and held taut around a set of splints for binding purposes, by a simple winding device attachable to one or other of the splints. This device is adapted to receive the two ends of a flexible element in such a manner that, on rotation of a winding part of the device, the said two ends are drawn towards one another to tighten to any desired extent, the bight which encircles the splints and the damaged limb. Stop means are provided for retaining this winding part in any selected position so that the tautness of the flexible member may be maintained and/or increased or decreased as required.

The device according to the invention consists of a base member adapted to be adjustably positioned on a splint, a slotted winding member rotatably mounted in said base with a slotted end portion thereof projecting outwardly of the splint, and arranged to receive the two ends of a flexible strip-like binding element, and ratchet stop means co-acting with the winding member so as selectively to retain it in a fully wound position against the tension in the flexible binding element.

More particularly the winding member projects at right angles from the base member and acts windlass-fashion to wind upon itself both ends of the flexible binding element. The end thereof is provided with an open-ended axial slot of just sufficient width for the ends of the flexible binding elements to be slipped therein in an edgewise direction one above the other, or in side by side relationship.

The inner or lower end of the winding member is provided with a toothed wheel or disc which is arranged to co-act with a spring-pressed detent for retaining said member in any desired position on rotation thereof. Simple readily accessible means are included for enabling the detent to be disengaged for purposes of loosening or detaching the said flexible binding element.

It is to be understood that in actual practice two or more of the above described devices will be used in spaced relationship along the length of a splint. In the preferred construction the base of the device is adapted to be slidably engaged with a splint so as to be adjustably posi-

tionable therealong. The outer or top end of the winding member is provided with laterally extending wing pieces to facilitate rotation when grasped between a finger and thumb.

To enable the invention to be more clearly understood and carried into practice, reference is now made to the drawing filed with the provisional application in which like references denote like parts throughout the several views.

In the drawing:

Fig. 1 is a cross-section through a splint, showing manner in which a winding device constructed according to the invention co-acts therewith.

Fig. 2 is a plan view taken on Fig. 1,

Fig. 3 is a sectional end view showing the device in actual use and,

Fig. 4 is a plan view showing three winding devices as they would appear when used in spaced relationship along the length of a splint.

Referring to the drawing, reference A denotes the slotted winding member which is rotatably mounted in the raised platform part B of the sheet metal base member B₁, the ends B₂ of which are bent over on themselves to embrace in a slidable manner the opposite side edges of a splint C. The raised platform portion B provides a shallow recess for accommodating the toothed ratchet wheel D, and the detent lever E together with its actuating tension spring J. As clearly shown in Fig. 2, the detent is constituted by the shoulder G in the lever E which is pivotally attached to the base member by the pivot pin F. The deformation of the middle portion of the base member to provide the recess for the ratchet wheel D and lever E, results in the provision of two low vertical walls X through an aperture Y in one of which, the free end of the lever E is arranged to project, so as to be readily accessible for manipulation by the fingers when required.

The winding member A in the form of a cylindrical pin with lateral wing extensions H, is provided with the open-ended axial slot Z to receive the ends of the webbing binding straps K.

In operation the winding device is used as shown in Figs. 3 and 4, in which a limb M is shown supported between upper and lower splints C and L. As shown, the webbing straps, after encircling the splints and the limb have their ends inserted one above the other in the slot Z. Thereafter rotation of the winding member A in a clockwise direction, causes the said ends to be wound upon itself windlass-fashion until the required degree of tautness is reached in each case. Co-action between the detent

shoulder G and the teeth of the ratchet wheel D, retains the winding member in the position in which it is released. To release the strap K for removal or adjustment, the projecting end of the lever E is manipulated to disengage the detent G from the teeth of the ratchet wheel D. The base member B₁ is conveniently made of sheet metal such as aluminium, steel, brass or the like. Alternatively it may be made from a "plastic." The winding member A, instead of being cylindrical, may be rectangular or any other shape in cross-section.

What we claim is:

1. A tensioning device for a splint assembly which includes a pair of splints and a flexible strap adapted to encircle the same, said device comprising a base mounted on the outside of one splint, and a hand actuated winding member rotatably mounted on the base and projecting therefrom, said winding member being arranged for detachable connection with the end portions of the strap in winding and tensioning relation thereto; said base extending transversely of said one splint, the ends of the base being formed to provide inwardly facing, longitudinally extending slots below the base to slidably receive opposite edges of said one splint whereby the base is adjustable along said splint.

2. A tensioning device for a splint assembly which includes a pair of splints and a flexible strap adapted to encircle the same, said device comprising a base mounted on the outside of one splint, and a hand actuated winding member rotatably mounted on the base and projecting therefrom, said winding member being arranged for detachable connection with the end portions of the strap in winding and tensioning relation thereto; said winding member projecting outwardly from the base, and being formed with an axial slot open at its outer end which receives said end portions of the strap therein edgewise.

3. A tensioning device for a splint assembly which includes a pair of splints and a flexible strap adapted to encircle the same, said device comprising a base mounted on the outside of one splint, and a hand actuated winding member rotatably mounted on the base and projecting therefrom, said winding member being arranged for detachable connection with the end portions of the strap in winding and tensioning relation thereto; said winding member projecting outwardly from the base, and being formed with an axial slot open at its outer end which receives said end portions of the strap therein edgewise, and finger engaging wings projecting laterally from the member on opposite sides of the slot.

4. A tensioning device for a splint assembly which includes a pair of splints and a flexible strap adapted to encircle the same, said device comprising a base mounted on the outside of one splint, said base including a raised platform intermediate its ends, a hand actuated winding member rotatably mounted on and projecting outwardly from said platform, and a manually releasable pawl and ratchet unit mounted under said platform in connection with said winding member, said winding member being arranged for detachable connection with the end portions of the strap in winding and tensioning relation thereto, and said pawl and ratchet unit normally preventing rotation of said member in a strap unwinding direction.

5. A device as in claim 4 in which the base includes an upstanding wall at one end of the platform, there being a slot in said wall, and the pawl and ratchet unit including a releasing lever projecting out of said slot for ready access.

6. A tensioning device for a splint assembly which includes a pair of splints and a flexible strap adapted to encircle the same, said device comprising a base mounted on the outside of one splint, a cylindrical winding member rotatably mounted on and projecting outwardly from the base, said winding member being slotted lengthwise for some distance from its outer end, the end portions of the strap being adapted to engage edgewise into the slot from opposite sides thereof, and opposed finger engaging wings projecting laterally from the winding member at its outer end whereby to permit the straps to wind onto said member inwardly of said wings.

7. A tensioning device for a splint assembly which includes a pair of splints and a flexible strap adapted to encircle the same, said device comprising a base having an elevated platform intermediate its ends and inwardly extending portions at said ends forming facing slots to slidably receive adjacent edges of said one splint, an outwardly projecting winding member journaled at its inner end through the platform, said winding member being formed to connect with end portions of said strap in winding relation thereto, a ratchet wheel fixed in connection with said winding member beneath the platform, and a manually releasable pawl cooperating with said ratchet wheel and normally preventing rotation of the winding member in a strap unwinding direction.

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