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H. B. LEWIS

2,415,214

SAFETY HAT

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Fig. 2.

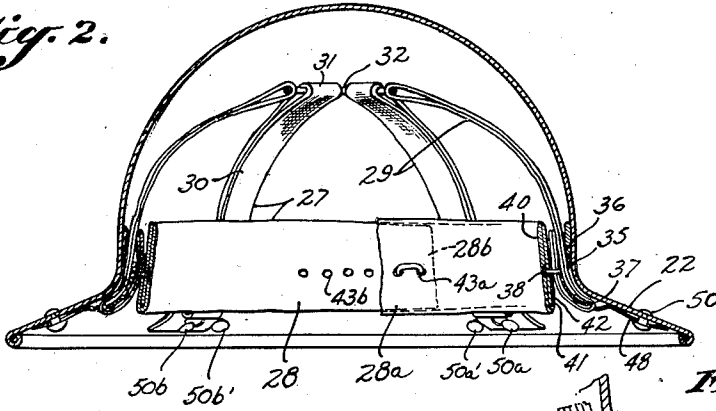


Fig. 3.

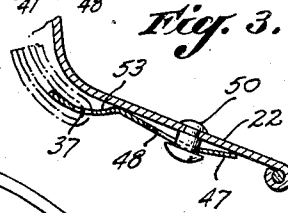


Fig. 1.

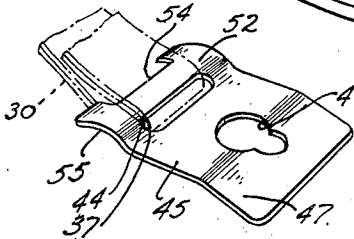
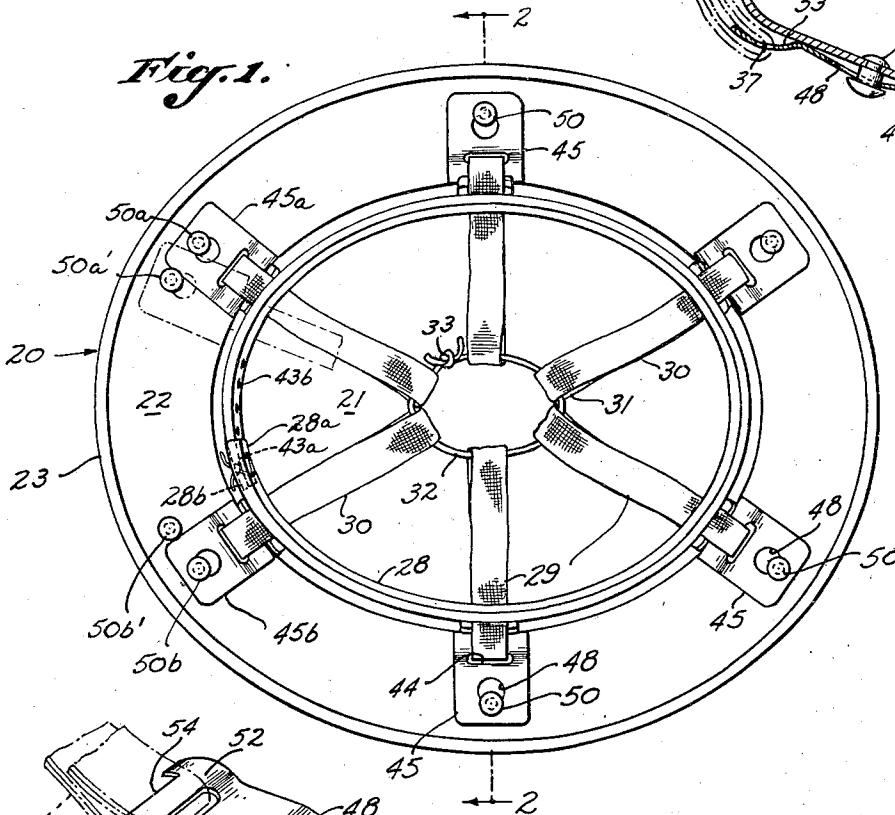


Fig. 4.

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FOR THE FIRM
ATTORNEYS.

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SAFETY HAT

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3 Claims. (Cl. 2—3)

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My invention relates to a protecting device, with special reference to safety hats or helmets.

In many industries and construction operations, such as the erection of oil well derricks and buildings, mining and tunneling activities, etc., there is a considerable hazard from falling objects which frequently maim or kill the workmen. The necessity of preventing head injuries by protecting the cranium from impact is very real and very apparent, as indicated by the many millions of safety hats issued to construction workers and industrial operators.

Such safety hats absorb a part of the impact force and dissipate the remainder by distributing it over a broad area of the head of the wearer and thus prevent serious injury. This protection may be obtained by forming the safety hat of ductile or deformable material, such as sheet metal, and by supporting this shielding device by means of an inverted cradle or head band assembly comprised of a radial network of cotton straps whose ends are releasably engaged with the brim of the safety hat, an arrangement which maintains a spacial relationship between the head of the wearer and his safety hat. This head band assembly constitutes a very effective shock absorber and provides numerous other advantages, such as ventilation space between the cranium and the hat-like shell mounted thereon.

The utility of such safety hats with such head band assemblies in which the end of each strap may be connected to only one point on the hat is limited by the fact that they cannot in a practical way be adjusted for substantial differences in the size of the head band.

It is an object of my invention to provide a safety hat of the general character described in which the head band may be quickly and easily adjusted to substantially vary its effective length whereby the hat may be made to fit heads of substantially different sizes and shapes without impairing the comfort or safety afforded to the wearer.

Other advantages will be apparent from the following description of an exemplary embodiment, as illustrated by the drawing, in which:

Fig. 1 is a bottom plan view of the preferred form of my safety hat;

Fig. 2 is a transverse section, taken along the line 2—2 of Fig. 1, shown on a smaller scale than Fig. 1;

Fig. 3 is a fragmentary view of a brim section showing one of the releasable engaging means; and

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Fig. 4 is a perspective view of an attachment clip.

A general introduction to the invention may be gained by referring to the drawing, which is merely intended for illustrative purposes. In Fig. 1, the numeral 20 generally designates a hat-like shell shaped to provide a crown 21 and a brim 22 unitary therewith. The shell 20 may be formed of any suitable impact-resistant material and fabricated in any acceptable manner, as by stamping the shell from a single blank of Duralumin and turning the edge of the metal to form a bead 23. The exterior surface of the metallic shell 20 is preferably polished or treated to provide maximum reflectivity.

The head band assembly generally designated 27 comprises a head band member 28 and a cradle generally designated 29 that is adjustable to conform to the head of the wearer. The cradle 29 is preferably constructed in the form of a spider having substantially radially disposed tapes or straps 30. Each of these straps 30 may consist of a single ribbon of material, such as cotton, folded back on itself to form a loop 31 at the inner end of the strap. The inner loops 31 of the various straps are flexibly interconnected by an adjustable securing member 32 in the form of a simple woven cord whose ends are tied together in a knot 33 to form a central ring for the cradle. Each of the straps 30 passes downward through a slot 35 in a coupling member 36 of leather or other flexible sheet material, passes around the lower edge of the coupling member 36 and forms a loop 37 which may be employed for attaching the head band assembly 27 to the shell 20 in some releasable manner. Finally, the lower end of each tape 30 is connected by suitable means such as a rivet 38 both to the coupling member 36 and to the head band member 28. The latter comprises a ring of leather or other suitable flexible material that is preferably doubled to form an inner fold 40 and an outer fold 41 which encase a relatively tough reinforcing member 42 inserted therebetween and adapted for engagement with the inner ends of the various rivets 38. The latter extend outwardly through the reinforcing band 42, the outer fold 41 of the head band, the end of the strap 30 and the coupling member 36. The head band member 28 has one end 28a provided with a pair of openings 43a and telescoped over or overlapping with the other end 28b which is provided with a plurality of pairs of openings 43b. The head band member 28 may be adjusted to any desired size or effective length by secur-

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ing a lacing 43 in the pair of openings 43a and selected pair of the openings 43b.

Each of the loops 37 formed at the lower ends of the strap 30 may in the preferred form of my invention slidably extend through a slot 44 in a fastening member or clip 45 that is removably mounted on the under surface of the hat brim 22. It is apparent that each of the straps 30 performs the several functions of: receiving the adjustable securing member 32 to permit the cradle to be adjusted to a particular wearer's head; serving as the flexible elements of the cradle 29; connecting the cradle with the shell 20, by means of the clips 45; connecting the head band assembly 27 with the shell 20; and providing for equalization of forces between the connection of the cradle with the shell and the connection of the head band member 28 with the shell, this equalization being accomplished through the sliding connection of the strap 30 with the various coupling members 36. Thus, the upper portion of each of the straps 30 constitutes an element of the cradle 29 and the lower portion of each strap is an equalization means between the cradle and the head band member 28.

Each of the clips 45, best shown in Figs. 3 and 4, may be fabricated from suitable sheet metal, preferably flexible metal such as spring steel or high strength aluminum alloy. The clip has a leaf portion 47 toward its outer end formed to lie adjacent the under surface of the hat brim 22 and is provided in this leaf portion with a keyhole aperture 48, the narrower portion of the keyhole aperture being disposed toward the outer end of the clip and the broader portion of the keyhole aperture being disposed toward the inner end of the clip. The keyhole aperture 48 of the clip 45 is dimensioned to cooperate with a complementary stud or headed pin 50 mounted on the under surface of the hat brim 22, there being a plurality of such studs having positions on the brim corresponding with the required locations of the various clips 45.

A primary attribute of my present invention is achieved by equipping the hat brim 22 with several groups of studs 50 and utilizing a preselected stud 50a for engaging one of the forward or rearward clips 45. As illustrated in Fig. 1, the exemplary embodiment is characterized by a hat brim 22 having a forward or rearward end equipped with two pairs of studs, i. e., a primary pair of widely separated studs 50a, 50b, and a secondary pair of relatively closer auxiliary studs 50a', 50b'. As will be apparent from Fig. 1 of the drawing, as the size or effective length of the head band 28 is substantially reduced by causing the one end 28a of the head band 28 to telescope or overlap the other end 28b to a substantially greater extent the loop 37 of each of tapes 30 adjacent the lacing 43 is thrown out of alignment with the remainder of the tapes, with the results that the shape of the head band 28 is distorted and the weight of the shell 20 is unequally distributed through the head band 28 and the tapes 30 over the head of the wearer. These results are enormously enhanced in value by impacts upon the shell 20 so that the comfort and safety to the wearer which it is the purpose of the hat to provide are substantially impaired. These disadvantages are overcome by attaching the clips 45a and 45b to the studs 50a' and 50b' respectively when the size or effective length of the head band 28 is thus substantially reduced. Such circumferential movement of the clips by virtue of the

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provision of the circumferentially spaced studs causes each of the loops 37 to remain in alignment with its respective tape 30 and the head band 28 to remain undistorted even though the head band 28 be substantially varied in size or effective length. Such adjustability of the points of attachment of the head band assembly to the shell 20 also provides comfort to wearers having heads of different shapes.

When the clips 45 are mounted on the brim 22 in their normal positions of engagement, as best shown in Fig. 3, the clips are placed in tension by loads imposed by the straps 30 and such tension is opposed in a positive manner by virtue of the fact that the tension draws the narrower end of each keyhole aperture 48 against the corresponding stud 50. Preferably, the leaf portion 47 of each clip 45 is bowed or arched away from the adjacent surface of the hat brim 22 to such an extent that appreciable pressure of the clip against the hat brim is necessary to force the clip into engagement with the stud 50, so that after the clip is in place it tends to maintain its normal alignment and resist accidental displacement forces. A second reason for giving the leaf portion of the clip such a bent configuration is that this construction permits considerable tolerance in the spacing of the head 51 of a stud from the under surface of the hat brim 22.

The inner end of each clip 45 may be formed with an arcuate offset 52 providing a transverse groove 53, the face of the groove being upward when the clip is in its normal position. The slot 44 for receiving the loop 37 of one of the cradle straps is cut transversely of the clip at the outer side of the transverse groove 53 and a notch 54 for the strap 30 is cut in the inner end of the clip in alignment with the slot 44. Preferably the side edges of each clip at the ends of the transverse groove 53 are bent inward to form inclined side flanges 55, as best shown in Fig. 4. In the construction described, one side of each loop 37 formed by a strap 30 extends across the groove 53 of a clip 45, the strap 30 passing through the slot 44 and the notch 54 of the clip.

In the preferred form of my invention described hereinabove, the keyhole aperture is in the clip and the stud for connecting the clip to the hat shell is fixedly mounted on the brim of the shell. This arrangement of the stud and the keyhole aperture may be reversed, of course, by forming the aperture in the brim 22 with the narrower portion of the aperture directed inwardly and by affixing a stud or headed pin to the engagement surface of a clip having characteristics similar in all other respects to the clip 45 and adapted for resiliently bowing or arching to maintain the stud under tension when the clip is in its normal position.

The foregoing construction of my safety hat exemplifies several features. One feature is that the head band assembly 27, including the cradle 29, may be quickly stripped from the hat shell 20. This feature allows detachment of the absorbent materials in a very few seconds, an expedient which enables workman to provide their own head band assembly and install such absorbent head gear in any size hat shell whenever desirable, as determined by considerations of maintenance and sanitation.

Another feature of my invention is achieved by the utilization of auxiliary studs 50' in the foregoing construction, for the purpose of increasing the practicability of the industrial sys-

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tem of installing personal head band assemblies in random hat shells.

The provision of the auxiliary studs such as those indicated by the numerals 50a' and 50b' permits the head band assembly to be quickly and easily adjusted to substantially different sizes or effective lengths of the head band to accommodate heads of different sizes without impairing the safety from impacts upon the hat or the comfort which are provided to the wearer.

The foregoing disclosure of an exemplary embodiment of my invention will suggest various modifications and substitutions that do not depart from the inventive concepts defined by the appended claims.

I claim as my invention:

1. In a head protector, the combination of: a hat shell; a head band assembly including a head band of variable length, and head engaging straps connected to said head band against circumferential movement relative thereto and extending substantially radially inwardly therefrom, and a plurality of primary connecting means associated with said shell in circumferentially spaced relationship with each other; interconnecting means carried by said straps, one of said interconnecting means being releasably connected to each of said primary connecting means; and auxiliary connecting means associated with said shell for releasable connection to said interconnecting means when the length of said head band is substantially varied, whereby said straps are maintained unbent transversely of their length and flat on the head of the wearer with substantially different lengths of said head band.

2. In a head protector, the combination of: a hat shell; a head band assembly including a head band of variable length, and head engaging straps connected to said head band against circumferential movement relative thereto and extending substantially radially inwardly therefrom, and a plurality of primary studs associated with said shell in circumferentially spaced rela-

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tionship with each other; clips carried by said straps, one of said clips being releasably connected to each of said primary studs; and auxiliary studs associated with said shell for releasable connection to said clips when the length of said head band is substantially varied, whereby said straps are maintained unbent transversely of their length and flat on the head of the wearer with substantially different lengths of said head band.

3. In a head protector including a head band assembly of a head band of variable length with straps connected to the band against circumferential movement relative thereto and extending substantially radially inwardly therefrom and into engagement with the head of the wearer, and a plurality of interconnecting members carried by the straps, the combination of: a hat shell; a plurality of primary connecting means associated with said shell in circumferentially spaced relationship with each other, there being one said connecting means releasably connected to each of said interconnecting members, whereby the straps are untwisted and flat on the head of the wearer with the head band of one length; and a plurality of auxiliary connecting means associated with said shell in circumferentially spaced relationship with related ones of said primary connecting means, the releasable connection of said interconnecting members to said auxiliary connecting means instead of said related primary connecting means maintaining the straps untwisted and flat on the head of the wearer with the head band of substantially different length.

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REFERENCES CITED

The following references are of record in the file of this patent:

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Number	Name	Date
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