March 27, 1956 E. W. BULLARD 2,739,311

SAFETY CAP

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Fig. 1

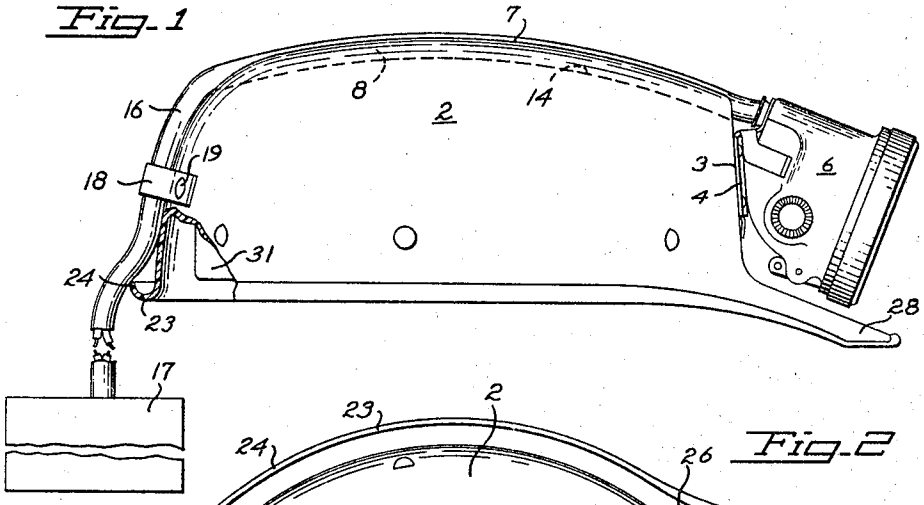


Fig. 2

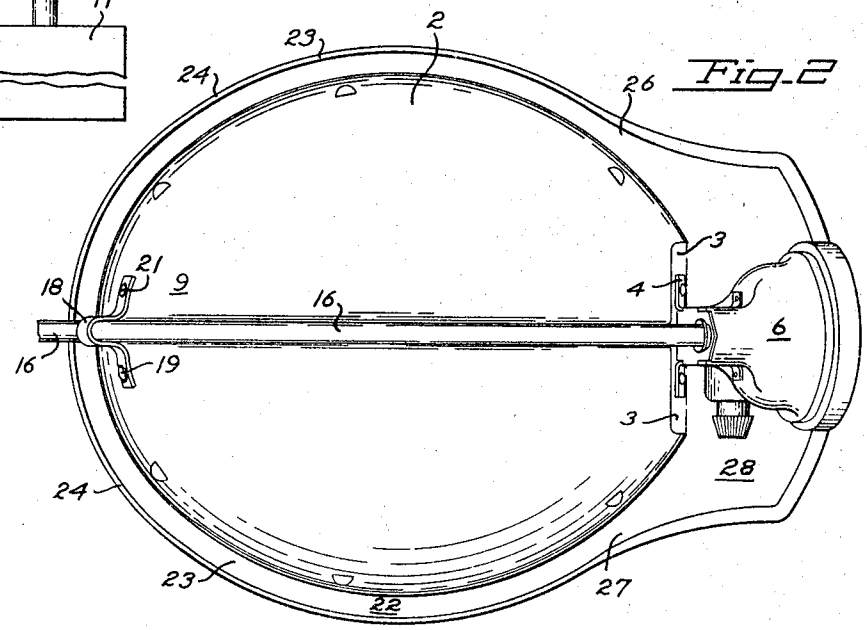
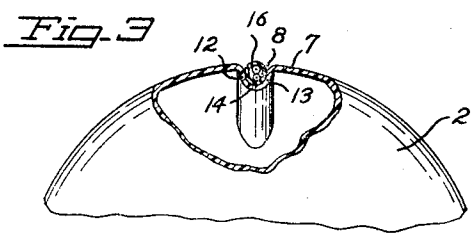


Fig. 3



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SAFETY CAP

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2 Claims. (Cl. 2—3)

My invention relates to rigid crown safety hats and caps; and particularly to a rigid crown miner's safety cap.

One of the objects of my invention is the provision in a rigid crown hat or cap of an integral structure constituting a rigid beam extending longitudinally of the crown for increasing its resistance to crushing as the result of blows received from above or from the side.

Another object is the provision of such a strengthening beam which also functions as a freeway or conduit for holding and protecting the electrical conductor by which a lamp carried on the cap may be supplied with current.

My invention possesses other objects, some of which with the foregoing will be brought out in the following description of the invention. I do not limit myself to the showing made by the said description and drawings since I may adopt variant forms of the invention within the scope of the appended claims.

Referring to the drawings:

Figure 1 is a side elevation of my invented structure as applied to a miner's cap.

Figure 2 is a plan view; and

Figure 3 is a fragmental view of the cap crown, a portion of which is broken away to show a vertical section.

In the mining industry, one of the most important pieces of safety equipment for preventing injury to the head, is the miner's safety cap. Since the miner generally works below ground level, he is frequently exposed to injury by rock fragments falling from the ceiling, or impelled by blast.

It is therefore essential to the miner's protection that his headgear shall be capable of withstanding severe stresses applied from above as well as from the side.

Another hazard quite distinct from that of falling or flying fragments, and one to which the miner is peculiarly subject because much of his work is in semi-darkness and in close quarters, are accidents to his lamp which is customarily mounted on the front portion of his cap. In recent years, these lamps have usually been electric; and are supplied by feed wires extending to a battery carried on the miner's back. Entanglement of these feed wires with projecting or low hanging formations or mine structure may extinguish the light, or knock off the cap, or result in direct injury to the head or neck of the miner. It therefore becomes important to so arrange the feed wires as to escape accidental contact with structure or objects which may be in close proximity to the miner's head.

Both of these prime requisites for the miner's safety are supplied in my cap construction; and this is accomplished by incorporating into the rigid cap structure a rigid curved beam integral with the upper portion of the crown, and extending from front to rear thereof; and also a horseshoe-shaped beam integral with the lower portion of the crown and with its ends merging into the visor or bill of the cap at each side. Both beams in cross section are U-shaped or of rounded channel formation;

and both open upwardly. A very large increase in strength and resistance to deformation or crushing by blows coming from any direction is provided by these integrally formed curved and rigid beams; and each of them also has an additional or secondary function. The beam across the top of the crown provides a freeway or conduit in which the feed wires, from the lamp to the back of the crown, may lie secure. The horseshoe beam catches water and condensation collecting on the hat and conducts it as in a gutter onto the brim from which it falls free.

Broadly considered then, the safety hat of my invention as embodied in a miner's cap comprises a rigid crown in which is integrally formed a groove extending in a median line longitudinally across the top of the crown. This grooved structure constitutes a slightly curved beam integral with the crown, which greatly increases the resistance of the crown to crushing stresses applied from any direction but particularly applied by falling objects. This groove provides means for receiving and holding the feed wires of the miner's lamp.

The cap is also provided adjacent the lower edge of the crown with an outwardly and upwardly curved flange, also constituting a beam for resisting deformation of the crown, especially from laterally directed blows. The flange merges with the visor at one end of the cap and because of its shape also acts as a gutter for catching water and directing it from the back and sides of the cap to the visor from which it drains forwardly instead of upon the neck and shoulders of the wearer.

Referring to the drawings, my safety cap is formed by molding a thermosetting resin heavily reinforced with a mass of interlaced glass fibers. It comprises a rigid crown body **2** having at its front or anterior end an upright flat anterior wall portion **3**, to which is secured the customary lamp bracket **4**, for the mounting of an electric lamp **6**.

The top wall **7** of the crown body is molded with a groove **8** which extends longitudinally in the median line of the crown, merging into the anterior wall at the forward end, and into the posterior portion **9** of the crown at the other end. The rigid grooved structure, integral with and conforming to the curve of the crown body includes the side walls **12** and **13**, and bottom wall **14**.

It will be understood that the structure just described acts as a slightly convex channel beam in resisting the force of blows on the crown directed downwardly. The top of the crown **7** as will be observed in Fig. 1 extends along its axis from anterior to posterior in a general arcuate curve of convex shape.

In vertical section as seen in Figure 3, the beam is substantially U-shaped opening upwardly; and this shape obtains from the front end of the beam where it joins the anterior wall to its rear end where it merges into the posterior crown wall.

A secondary function of the beam is to provide a freeway or conduit in which is secured the cable **16**, holding the feed wires between the lamp and the battery pack **17**, usually carried by the workman on a belt at his back.

As will be seen in Figure 1, the groove provided in the crown is of such size and proportions as to cradle the cable for the entire length of the cap, thus substantially eliminating the possibility of the cable being snagged or accidentally displaced.

To secure the cable to the crown body and within the groove, a strap **18** is fixed at one end to the posterior portion of the crown by a rivet **19**. The strap is provided at its free end with a snap fastener **21**, adapted to engage a complementary fastener fixed on the crown.

To resist laterally directed blows, the lower edge of the crown body is also provided with a rigid channel beam **22**. This second beam is also formed integrally

with the crown body and comprises an outwardly and upwardly curving flange forming the bottom wall **23** and the low outer rim or wall **24**. The bottom wall **23** extends in substantially the same plane. This U-shaped relatively narrow channel beam lends rigidity and strength to the lower portion of the crown body, extending around both sides and the posterior end, thus having in the horizontal plane the shape of a horseshoe, the ends of which at **26** and **27** merge into the generally flat surface of the integral visor or bill **28**. The visor **28** while generally flat has front corner portions, see Fig. 1, which are lower than the central portion thereof and permit water from the anterior ends **26** and **27** of the channel beam **22** to drain off of the visor.

In addition to serving as a strengthening beam about the crown, the channel beam **22** acts as a gutter for catching moisture which accumulates on the crown, directing it toward and off of the visor in a direction away from the body.

In order to position the cap comfortably on the head, it is provided with the conventional or any desired suspension means, including a sweatband **31**, a portion of which is shown in Figure 1.

I claim:

1. A safety hat comprising an integrally formed rigid crown body having a flat upright anterior wall, a bracket on said anterior wall for mounting a lamp, said crown having a groove extending over its top in a median line from said anterior wall to the posterior portion of the crown, said grooved portion constituting a rigid channel beam and also forming a freeway for feed wires to the lamp on said lamp bracket, a lamp detachably mounted on the bracket, feed wires for the lamp disposed in said channel, and releasable means for securing to the crown body the feed wires in said channel.

2. A safety hat comprising a rigid crown body having a groove extending longitudinally across the top of the crown, the top of said crown along its axis from anterior to posterior extending in a gradual arcuate curve, said grooved top constituting a channel beam to resist crushing from downwardly directed blows, the lower edge of the crown being extended outwardly in substantially the same plane and upwardly therefrom to constitute a relatively narrow channel beam extending continuously around the side and posterior lower edges of the crown to resist crushing from laterally directed blows to catch and conduct moisture from the crown toward the anterior portion of the crown, and a downwardly directed visor on the anterior lower edge of the crown merging into the anterior ends of the last named beam, said visor having front corner portions lower than the central portion of the visor whereby moisture collected and conducted by the channel beam at the lower edge of the crown passes onto said downwardly directed visor where it drains off at said corner portions.

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