

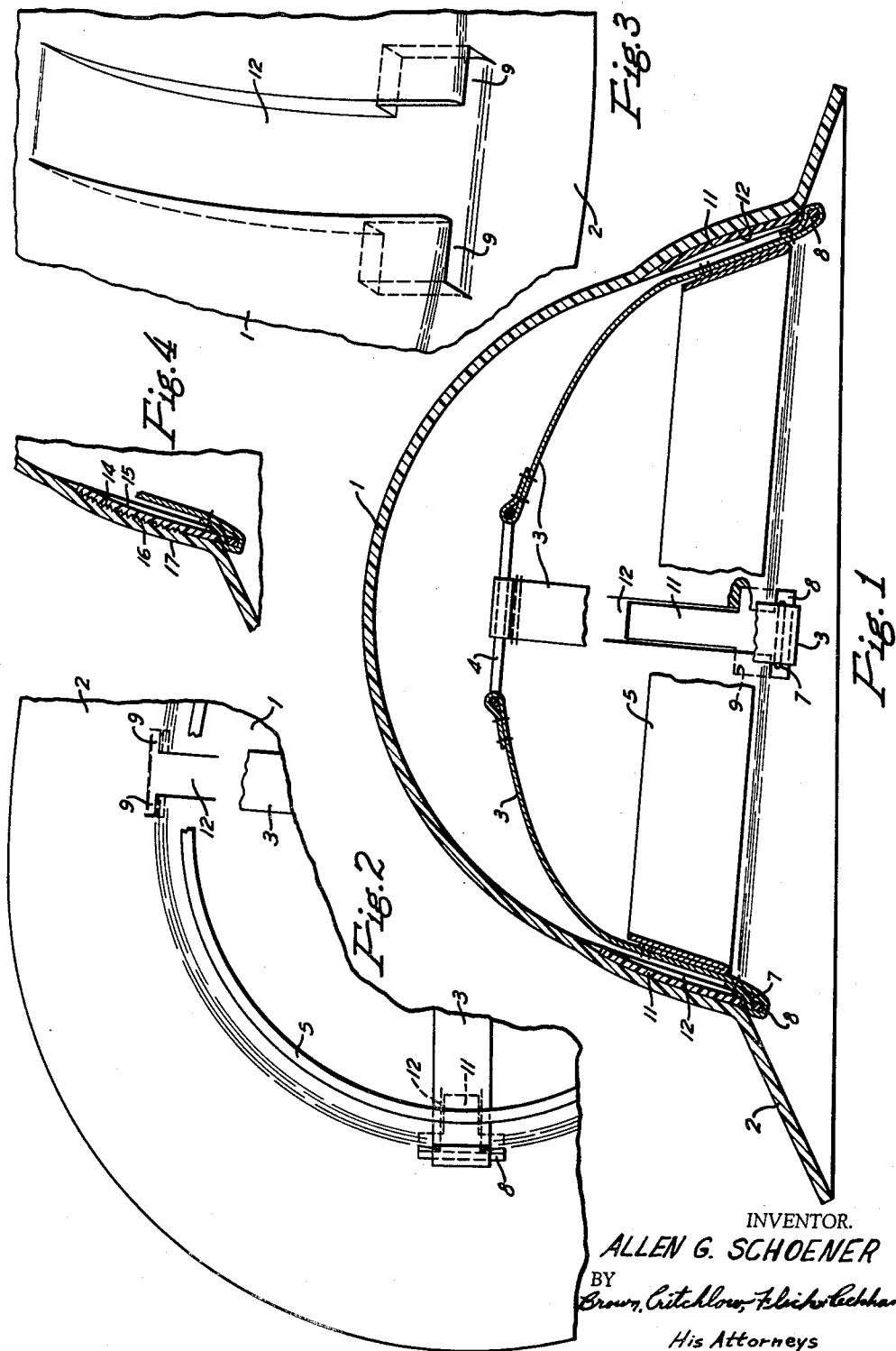
June 21, 1960

A. G. SCHOENER

2,941,209

PROTECTIVE HELMET WITH REMOVABLE SUSPENSION

Filed Oct. 28, 1958



INVENTOR.
ALLEN G. SCHOENER
BY
Brown, Critchlow, Fleck & Leckman
His Attorneys

1

2

2,941,209

PROTECTIVE HELMET WITH REMOVABLE SUSPENSION

Allen G. Schoener, Pittsburgh, Pa., assignor to Mine Safety Appliance Company, Pittsburgh, Pa., a corporation of Pennsylvania

Filed Oct. 28, 1958, Ser. No. 770,095

5 Claims. (Cl. 2—3)

This invention relates to protective helmets, such as are worn by industrial workers to protect their heads from falling objects, and more particularly to means for detachably fastening a helmet suspension in place.

The conventional protective helmet or hard hat is held in position on the head by means of a lining or suspension inside of it. The suspension includes a head-receiving cradle, generally formed from straps engaging the head and having their lower ends connected to the helmet shell. One of the major problems in the design of such helmets is the means by which the suspension is fastened in place. The fastening means must be capable of withstanding impacts against the helmet without breaking or separating from the shell. The fastening means should also be relatively neat in appearance and blend into the contour of the shell, so that there will be no protrusions outside of the shell to snag on foreign objects or inside the shell to cause pressure on the head of the wearer. It also is highly desirable that the suspension be easily removable from the shell for cleaning and replacement purposes. In the case of helmets for electrical workers, there must be no exposed metal parts holding the suspension in place.

It is among the objects of this invention to provide a protective helmet, in which the suspension is easily removed and replaced, in which no metal parts are involved, in which the suspension fasteners are extremely simple, in which there are no objectionable protrusions, and in which there is no danger of the suspension accidentally separating from the helmet shell.

In accordance with this invention, a rigid helmet shell contains a head-receiving cradle that has head-engaging straps. Fastened to the lower ends of the straps are lugs, that extend upward from the straps. A relatively stiff tongue extends upward from the upper edge of each lug. The inside of the shell is provided with upwardly extending sockets that removably receive the ends of the lugs, with the tongues projecting upward from them in tight engagement with the inner surface of the shell, whereby the tongues hold the lugs in the sockets. For best results, the tongue-engaging surface of the shell curves upwardly and inwardly in order to force the tongue to bend slightly as the lugs are inserted in the sockets. The engaging surfaces of the shell and tongues may, if desired, be provided with interengaging detents.

The invention is illustrated in the accompanying drawings, in which

Fig. 1 is a central longitudinal section through my helmet, with parts of the suspension broken away;

Fig. 2 is a fragmentary bottom view of the helmet, with parts of the suspension broken away;

Fig. 3 is an enlarged fragmentary inside view of the helmet, showing the sockets and recess for one of the fastening members; and

Fig. 4 is an enlarged fragmentary vertical section through a modified helmet, showing another embodiment of the invention.

Referring to Figs. 1 and 2 of the drawings, the rigid shell of a protective helmet has a dome-shaped crown 1 surrounded at its bottom by an integral brim 2. Inside of the shell there is a head-receiving cradle formed from straps 3 of any suitable material. These straps may cross at the top of the head, or they may have their upper ends joined by a lace 4 in order to make the cradle adjustable. Disposed inside the lower portion of the cradle and attached to the straps in any suitable manner is the usual headband 5.

The lower ends of the cradle straps extend below the headband and are looped through slots 7 in the lower part of strong lugs 8 to connect the lugs and straps permanently. Each lug may be a plate-like element of generally rectangular shape. It extends upward a short distance along the outside of the strap attached to it, and it also projects laterally from opposite edges of the strap to form end portions. The lugs are detachably connected to the helmet shell by inserting their end portions in sockets molded into the shell. Thus, the shell is molded to provide it with a pair of laterally spaced, downwardly opening sockets 9 adjacent the lower end of each strap. The adjacent sides of each pair of sockets also are open. The lugs are inserted upwardly in the sockets to support the shell. The lugs in turn are supported by the cradle straps. The suspension can be removed quickly from the shell by merely pulling the lugs down out of the sockets.

Nevertheless, it is a feature of this invention that the lugs normally are held securely in the sockets, so that the suspension will not separate from the helmet accidentally even when the helmet is carried by the suspension. For this purpose, each lug has an integral tongue 11 extending upward a couple of inches or so from its upper edge. The tongue is narrower than the lug and is centrally located. It is relatively stiff, by which is meant that although it appears to be rigid, it can be bent lengthwise to some extent by applying a moderate amount of pressure to it. The purpose of the tongues is to tightly engage the inner surface of the crown in order to hold the lugs in the sockets. The tongue-engaging surface of the crown is curved upwardly and inwardly enough to require the tongues to bend slightly when the lugs are pushed up into the sockets. This bending of the tongues forces them very tightly against the shell to produce the desired friction between the meeting surfaces. The crown preferably is provided with recesses 12 that receive the tongues. Each recess extends upward from between a pair of sockets and merges into the unbroken surface of the crown above the level of the tongues. The recesses are not much wider than the tongues. The tongue-engaging surfaces of the recesses are curved to bend the tongues lengthwise. Although the tongues hold the lugs securely in the sockets, the lugs can be removed by exerting considerable pull downward on the cradle straps.

If desired, the friction between the tongues and the shell can be increased by providing them with interengaging detents. This is illustrated in Fig. 4, where the detents are shown as serrations 14 extending across a tongue 15 and interfitting with similar serrations 16 on the hat shell 17.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. A protective helmet comprising a rigid shell, a head-receiving cradle in the shell having head-engaging straps,

3

lugs fastened to the lower ends of the straps and extending upward therefrom, each lug having laterally projecting ends, and a relatively stiff tongue joined to each lug and extending upward from the central portion of the top of each lug between said projecting ends, the inside of the shell being provided near its bottom with pairs of upwardly extending sockets removably receiving the ends of the lugs and holding them in the lower part of the shell, and the tongues projecting upwardly above the sockets into tight engagement with the inner surface of the shell above the sockets to hold the lugs in the sockets.

2. A protective helmet according to claim 1, in which said tongue-engaging surface of the helmet shell curves upwardly and inwardly to bend said tongues.

3. A protective helmet according to claim 1, in which engaging surfaces of the helmet shell and tongues are provided with interengaging detents.

4. A protective helmet comprising a rigid shell, a head-receiving cradle in the shell having head-engaging straps, lugs fastened to the lower ends of the straps and extending upward therefrom, each lug having laterally projecting ends, and a relatively stiff tongue joined to

4

each lug and extending upward from the central portion of the top of each lug between said projecting ends, the inside of the shell being provided near its bottom with pairs of upwardly extending sockets removably receiving the ends of the lugs and holding them in the lower part of the shell, and the inside of the shell also being provided with a recess extending upwardly from between each pair of sockets and receiving a tongue, the tongues and shell tightly engaging each other in said recesses to frictionally hold the lugs in the sockets.

5. A protective helmet according to claim 4, in which the tongue-engaging walls of the recesses curve upwardly and inwardly to bend said tongues.

References Cited in the file of this patent

UNITED STATES PATENTS

2,585,937	Johnson et al.	Feb. 19, 1952
2,795,792	Finken	June 18, 1957
2,853,708	Austin	Sept. 30, 1958
2,858,538	Simpson	Nov. 4, 1958