

May 12, 1942.

M. SCUDDER ET AL

2,282,830

PROTECTIVE HELMET

Filed May 1, 1941

2 Sheets-Sheet 1

FIG. 1.

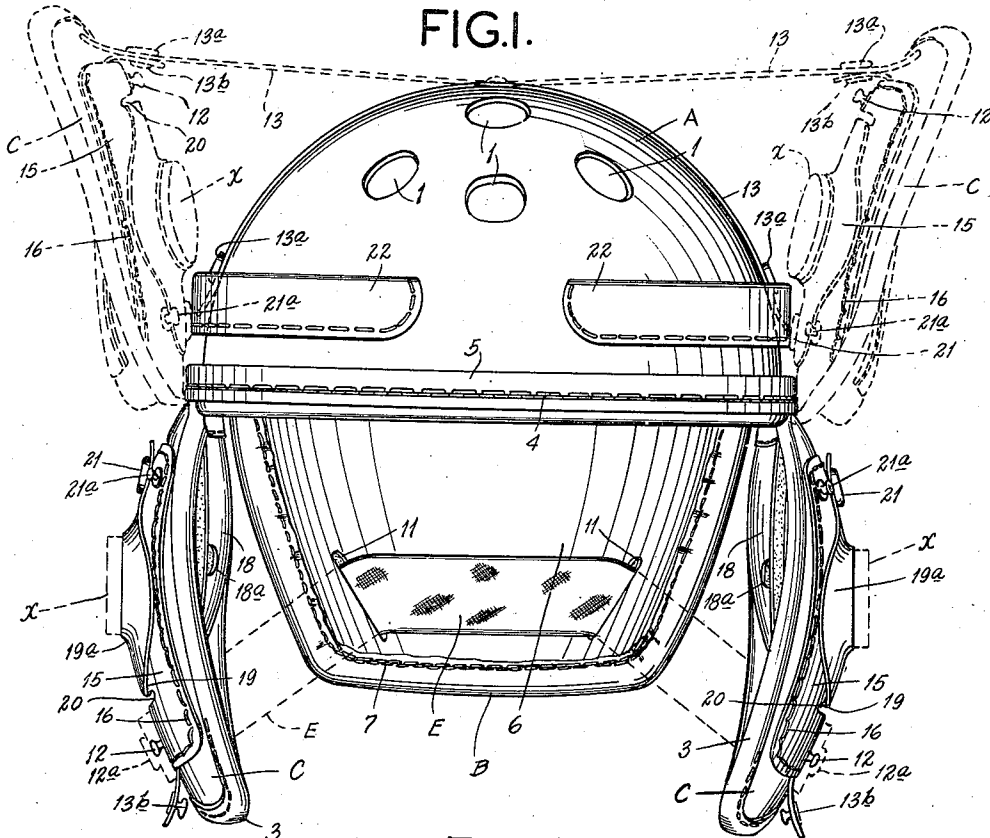


FIG. 4.

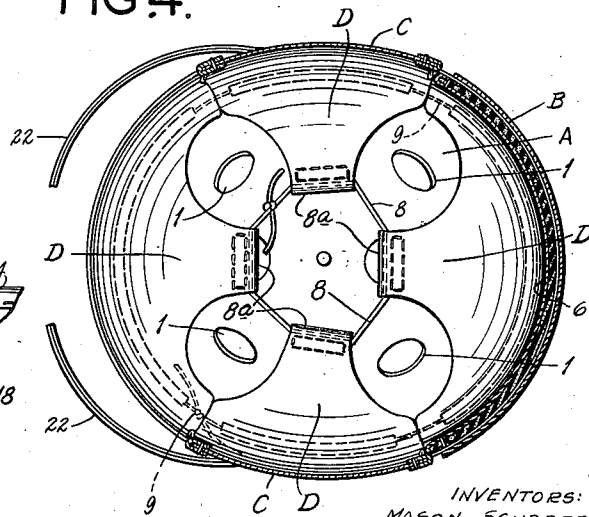
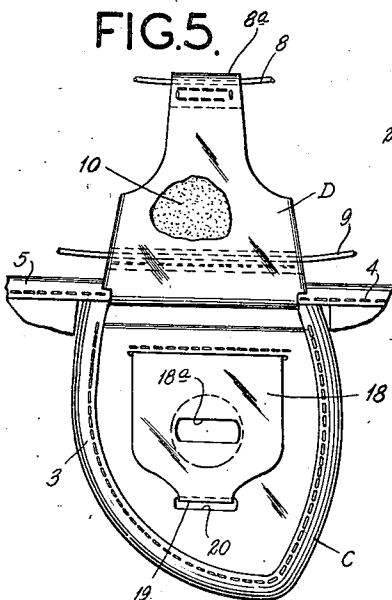


FIG. 5.



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2 Sheets-Sheet 2

FIG. 2.

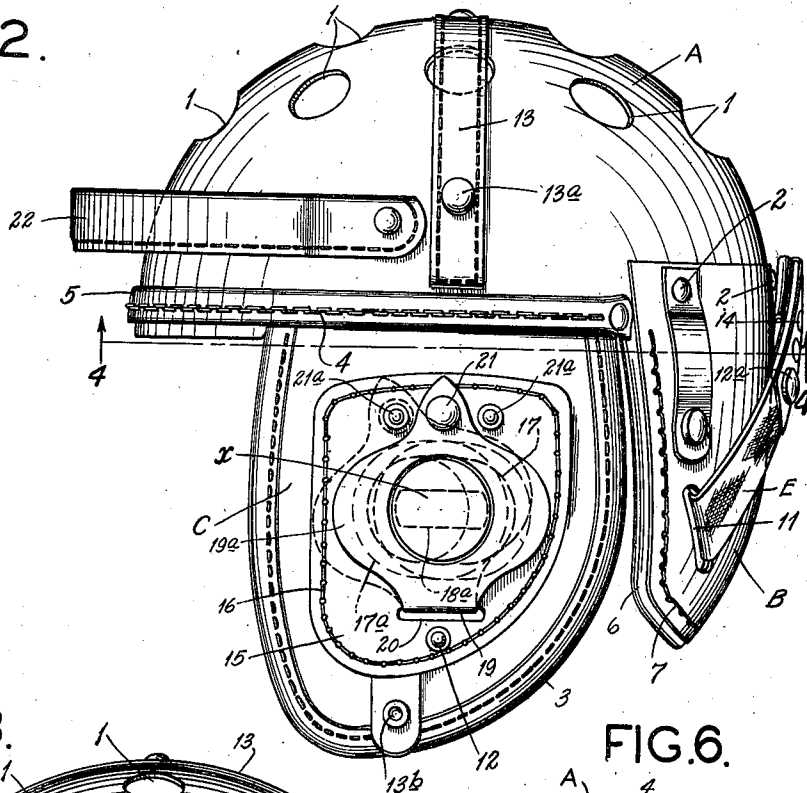


FIG. 3.

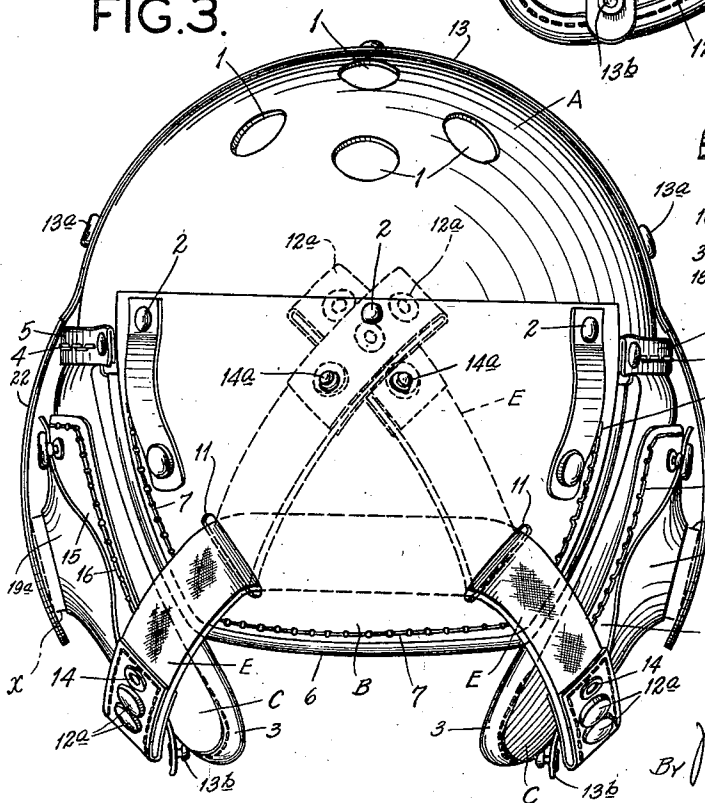
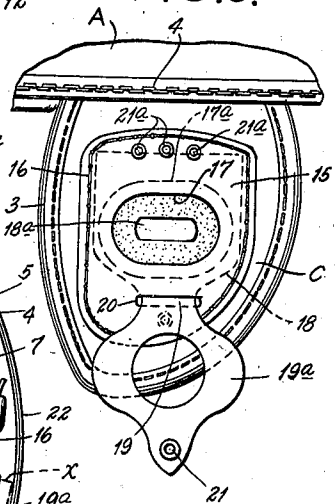


FIG. 6.



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2,282,830

PROTECTIVE HELMET

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Application May 1, 1941, Serial No. 391,314

11 Claims. (Cl. 2—3)

This invention relates to helmets, and has for one of its objects to provide an efficient, lightweight protective helmet that is comfortable, snug-fitting, and well ventilated.

Another object is to provide a protective helmet that can be removed and installed quickly and without the necessity of manipulating or adjusting a chin strap, or equivalent device.

And still another object of our invention is to provide a helmet that is equipped with a means of novel construction for holding ear phones in proper position and in comfortable relationship with the user's ears. Other objects and desirable features of our invention will be hereinafter pointed out.

Figure 1 of the drawings is a front elevational view of our improved helmet.

Figure 2 is a side elevational view.

Figure 3 is a rear elevational view.

Figure 4 is a horizontal sectional view, on a reduced scale, taken on the line 4—4 of Figure 2, looking in the direction indicated by the arrows.

Figure 5 is a fragmentary view, on a reduced scale, showing the inner side of one of the ear flaps; and

Figure 6 is a fragmentary view, showing the outer side of one of the ear flaps.

In the accompanying drawings which illustrate the preferred form of our invention, A designates the crown portion of the helmet, which consists of a substantially dome-shaped, lightweight, rigid member made of hard fibre or other suitable material and provided with ventilating holes 1. At the rear end of the crown member A is a depending neck shield or guard B formed from the same kind of material as the crown member and rigidly attached to same, said neck guard B being curved transversely and longitudinally and made of such width and depth that it co-acts with the crown member to completely cover the back portions of the user's head and neck. Ear flaps C are hinged or pivotally attached to the bottom edge of the crown member A immediately in front of the back shield B, said ear flaps being made of such depth that when the helmet is in operative position on the user's head, the lower ends of said ear flaps will be located at or slightly below the user's jaw bones. The ear flaps C are formed partly from material that is relatively soft, pliable or flexible, and partly from material that is rigid or inflexible.

In the preferred form of our invention herein illustrated the shaped piece of fibre or other

stiff material that constitutes the neck shield B is arranged in overlapping relationship with the bottom edge portion of the crown member A and rigidly attached to same by metal rivets 2, as shown in Figures 2 and 3. Each of the ear flaps C comprises a relatively thick piece of pliable material, such as felt or sponge rubber, faced on its inner and outer sides with relatively thin sheet material, such as thin leather or fabric, the major portion of the peripheral edge of the flap being provided with a binding 3. The top edge of the ear flap is permanently connected to the bottom edge portion of the crown member A, preferably by thread stitches 4 that also pass through a finishing strip or binding 5, formed by a folded piece of leather that embraces the top edge portion of each ear flap. The ear flaps are not attached or connected to the neck shield B, but instead, consist of hinged or swinging elements on the crown member that can move independently of and relatively to the neck shield. As shown in the drawings, the rear edges of the ear flaps are spaced away from the front edges of the neck shield. The neck shield or guard B is provided on its inner side with a padding, formed preferably from a piece of felt, sponge rubber, or other suitable padding material overlapped by a facing piece 6 of leather that embraces the edge of the padding material and which is secured to the guard B by stitches 7 (see Figures 1, 2 and 3). Any suitable means can be used to prevent the crown member A from coming in direct contact with the user's head and injuring same, in the event the helmet strikes against an object, or is subjected to a blow from a passing or falling object while the helmet is in operative position on the user's head. In the helmet herein shown a shock-absorbing device, formed by four segmental-shaped pieces D, of leather or other suitable material, combined with a draw-string 8, are attached to the crown member A, so as to form a skeleton-like structure that engages the user's head in a way that holds the crown member A spaced slightly away from the head. As shown in Figure 4, the segmental-shaped pieces D extend inwardly and upwardly from the peripheral edge of the crown member A, and have their inner ends adjustably connected together by the draw-string 8 which extends through casings 8^a in the free end portions of the segmental-shaped pieces D. By tightening or loosening the draw-string 8, the tension of the head contacting pieces D can be varied so as to in effect raise or lower the crown member A with relation to the user's head. Preferably, a sec-

ond draw-string 9 is positioned in casings formed in the segmental-shaped pieces D adjacent the points where said pieces are attached to the crown member A, so as to enable the pieces D to be adjusted to change the internal circumference of the shock-absorbing device of the helmet, thus providing a size adjustment that can be changed quickly and easily. Pads of felt, rubber, or other suitable padding material 10 are preferably secured to the inner faces or sides of the segmental-shaped pieces D that are presented towards the crown member A, so as to eliminate the possibility of the user's head being injured or made uncomfortable by contact with the edge portion of the crown member A. Under no circumstances is it possible for the user's head to be struck by the relatively stiff and hard crown member A, due to the fact that there is a padded band which extends around the interior of the crown member A at the bottom edge of same, and there is a skeleton-like structure, under tension, that covers the crown of the user's head and holds the stiff member A spaced slightly above the crown of the user's head.

In helmets of conventional construction the helmet is retained in operative position on the user's head by a chin strap attached to the lower ends of the ear flaps of the helmet in such a way as to draw said ear flaps inwardly into engagement with the side portion of the user's face. In installing and removing such a helmet it is necessary that the chin strap be manipulated or adjusted, and, under certain conditions, or at certain times, this is highly objectionable. Accordingly, we have discarded the conventional chin strap and have constructed the helmet so that there is no portion of same that is disposed transversely, in front of the user's face or throat, that has to be released or manipulated before the helmet can be removed from the user's head. In our improved helmet the ear flaps C are drawn inwardly towards each other and are held in snug engagement with the side portions of the user's face by retaining devices, preferably of a resilient or elastic nature, that lead forwardly from the neck shield or guard B, and which are attached to the lower end portions of the ear flaps C. Preferably, the retaining devices just referred to are formed by a member E made of elastic webbing, arranged transversely on the inner side of the neck shield or rear guard B, as shown in Figure 1, and having its end portions projecting outwardly through upright slots 11 in the guard B, the end portions of said piece of elastic webbing E having fastening devices for enabling them to be detachably connected to the lower ends of the ear flaps C. It is immaterial what type or kind of means is used for enabling the end portions of the member E to be detachably connected to the ear flaps, but we prefer to use for this purpose conventional glove fasteners comprising buttons 12, carried by the ear flaps, and co-operating socket pieces 12^a carried by the resilient member E. As shown in the drawings, a plurality of socket pieces 12^a are provided for each end portion of the member E, so as to enable said member to be set or adjusted so as to produce a different pressure or inward pull on the lower end of the ear flaps C. In the normal use of the helmet the end portions of the member E lead forwardly from the back shield or guard B, and embrace the lower end portions of the ear flaps to which the free ends of the member E are detachably connected by the co-acting glove fastener elements on said parts. The portion of

the resilient or elastic element E that is positioned on the inner side of the guard or shield B, presses against the back part of the user's head at a point just above the nape of the neck, and hence, tends to prevent the helmet from moving upwardly relatively to the user's head. The tendency of the helmet to move upwardly is also overcome by the clamping action or clamping pressure exerted on the side portions of the user's face by the ear flaps C, which ear flaps, as previously stated, are separated by joints from the neck shield or rear guard B and are drawn inwardly into snug engagement with the user's jaw bones by the resilient member E, which is maintained in a taut condition by its inherent elasticity and by the pressure which the back portion of the user's head or neck exerts on the portion of the member E that extends transversely across the concaved portion of the neck shield or guard B. In the event the user desires to keep the helmet on his head without having his ears covered by the ear flaps, the ear flaps can be swung upwardly relatively to the neck shield into the position shown in broken lines in Figure 1, and retained in this inactive position by a transversely-disposed retaining strap 13 attached to the crown member A, and provided at its ends with glove fastener elements or similar devices or elements 13^a that can be snapped into engagement with co-acting fastening devices 13^b on the ear flaps. When the ear flaps are arranged in such an inactive or inoperative position, the free end portions of the elastic member E are folded upwardly and arranged in crossed relationship on the rear side of the neck guard D, as shown in full lines in Figure 2 and in broken lines in Figure 3, and retained in this position by glove fastener elements or similar retaining elements 14 thereon that are snapped into engagement with co-acting parts 14^a on the exterior of the neck guard B. Normally, however, the ear flaps C are drawn inwardly towards each other, as shown in Figure 3, by the pull which the resilient or elastic member E exerts on the lower end portions of the ear flaps.

The ear flaps C are provided with ear phone holders which are of novel construction, in that they have provision for enabling ear phones to be easily installed in or removed from the ear flaps and also for enabling the ear phones to be adjusted relatively to the ear flaps to adapt them to the particular user. Each ear flap C has attached to the outer side of same a supporting member 15 (see Figure 6), formed preferably from a piece of molded hard fibre that is secured by stitches 16 to the ear flap. A hole 17 is formed in the supporting member 15 to receive the ear phone, said hole 17 being oblong-shaped and arranged with its greatest dimension disposed horizontally, so as to provide for a horizontal adjustment of the ear phone forwardly and rearwardly. The shortest dimension or vertical axis of the hole 17 is of slightly less length than the flanged portion of the ear phone that is presented towards the user's ear, so as to enable the ear phone to be installed from the outside of the ear flap, by arranging the ear phone in an angular or tilted position, then inserting the flanged portion of same edgewise through the hole 17 in the supporting member 15, and then restoring the ear phone to its normal position, wherein the flanged portion of same lies behind or on the inner side of the supporting member 15 with a cylindrical portion of the ear phone projecting outwardly through the hole 17 in said supporting member.

The said cylindrical portion of the ear phone that projects outwardly through the hole 17 is of smaller diameter than the horizontal axis of the hole 17. Consequently, the ear phone can be adjusted forwardly and rearwardly in its supporting member 15, into the position where it is most comfortable to the user. A hole 17^a of slightly larger size than the hole 17 is formed in the body portion of the ear flap, or, in other words, in the padded portion of the ear flap, so as to receive the flanged inner portion of the ear phone, the ear phone being shown diagrammatically in Figure 2, and designated by the reference character x. The ear phone is retained in operative position in the supporting member 15 by a tab 18 attached to the inner side of the ear flap, as shown in Figure 5, and arranged in overlapping relation with the hole 17^a in the body portion of the ear flap that receives the flanged inner portion of the ear phone. Said tab 18 is provided with an extension 19 that passes through a slot 20 in the supporting member 15 and then projects upwardly, so as to embrace or surround the cylindrical portion of the ear phone that projects outwardly through the hole 17 in the supporting member 15, the upper end of said extension 19 being detachably fastened to the supporting member 15, as hereinafter explained. As shown in Figures 2 and 6, there is a yoke-shaped portion 19^a on the extension 16 that snugly surrounds the outwardly-projecting, cylindrical portion of the ear phone. At the upper end of said yoke-shaped portion 19^a is a fastening device 21 that is adapted to be engaged with one or the other of a group of fastening devices 21^a carried by the supporting member 15. If it is desired to adjust the ear phone forwardly, the upper end of the extension above the yoke-shaped part that surrounds the portion of the ear phone that projects outwardly through the hole 17 in the supporting member, is released and shifted forwardly into the position shown in broken lines in Figure 2, which operation shifts the ear phone forwardly relatively to the rigid supporting member 15 carried by the ear flap C. Similarly, if it is desired to adjust the ear phone rearwardly, the yoke-shaped extension piece 19^a that surrounds the outwardly-projecting portion of the ear phone can be moved rearwardly or to the right of the center line of the supporting member 15. The tab 18 on the inner side of the ear flap that laps over the inner side of the ear phone and prevents it from moving inwardly relatively to the rigid supporting member 15 in which it is positioned, is provided with a hole 18^a of elongated form, or other suitable shape, that will insure the user's ear drum being in practically direct communication with the ear phone in any one of the various lateral adjustments of the ear phone. When the ear phones are in use, they are held in snug engagement with the user's ears by shiftable spring arms 22 on the crown member A of the helmet that are adapted to be moved downwardly into overlapping relationship with the ear phones, as shown in Figure 3. The spring arms 22 also exert pressure on the ear flaps C in a direction tending to press said flaps inwardly against the user's head, and hence, said arms 22 assist in holding the helmet firmly in position on the user's head. When the ear phones are not in use, the spring arms 22 are usually arranged horizontally in the position shown in Figure 2. The tabs 18 and the yoke-shaped extensions 19^a on said tabs are preferably formed of leather, and the portions of the tabs 18 in which the elongated openings 18^a are

located, are preferably provided with padding material, such as felt or rubber, so that the ear phones will not exert an objectionable pressure on the user's ears.

A protective helmet equipped with ear phone holders of the construction above described is desirable, 1st, in that the ear phones are mounted on the exterior of the ear flaps of the helmet; 2nd, the ear phones are mounted on the ear flaps in such a way that they can be easily installed and removed from the outside of the ear flaps; 3rd, during the installation or removal of the ear phones it is unnecessary to break or establish any connections between the ear phones and the apparatus with which they co-act; 4th, the ear phones can be easily shifted forwardly and rearwardly on the ear flaps on which they are mounted so as to arrange them in the position where they will be most efficient and most comfortable to the user; and 5th, when the ear phones are in use they are held in snug engagement with the user's ears by a means independent of and separate and distinct from the ear flaps of the helmet, thereby producing a greater degree of efficiency for the ear phones than is possible to obtain in a helmet of the kind in which snug fitting of the ear flaps of the helmet is relied upon to hold the ear phones in operative relationship with the user's ears.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A protective helmet, comprising a crown member provided at its rear end with a depending rigid neck guard that is curved slightly in horizontal section, hinged ear flaps depending from said crown member and having their rear edges separated by gaps or open spaces from the front edges of said neck guard, a retaining means for the helmet comprising an elastic or resilient member on the inner side of the neck guard that is adapted to press against the back portion of the user's head, and extensions on said member leading forwardly from said neck guard and detachably connected to the lower ends of said ear flaps in a manner to draw said flaps inwardly towards each other.

2. A protective helmet, comprising a substantially rigid crown member provided at its rear end with a rigid depending neck guard whose inner side is of concave form, ear flaps hinged or pivotally attached to said crown member at a point in advance of said neck guard and separated from said guard by spaces, an elastic or resilient member arranged transversely of said neck guard on the inner side of same and having extensions that project outwardly through upright slots in said neck guard and then lead forwardly to the lower ends of the ear flaps to which said extensions are attached, and means for varying the tension which said elastic or resilient member exerts on the ear flaps.

3. A protective helmet, comprising a crown member made of substantially rigid material and provided at its rear end with a depending neck guard that is curved slightly transversely and longitudinally so as to conform approximately to the back of the user's head and neck, ear flaps hinged to the crown member and separated by gaps from said neck guard, a shock-absorbing device on the interior of the helmet comprising padded pieces of leather or the like secured to the crown member, and a resilient or elastic retaining device leading forwardly from the neck guard and detachably and adjustably connected to the lower ends of said ear flaps.

4. A protective helmet, comprising a crown member, ear flaps on said crown member, and ear phone holders on said ear flaps having provision for setting the ear phones in various positions, forwardly and rearwardly with relation to the longitudinal center line of the flaps and for holding the ear phones in adjusted position on the ear flaps.

5. A protective helmet, comprising a crown member, ear flaps on said crown member, ear phone supporting devices on said flaps provided with horizontally disposed elongated holes adapted to receive portions of the ear phones that project outwardly through said holes, and adjustable means for removably clamping the ear phones in adjusted position in said supporting devices.

6. A protective helmet, comprising a crown member, padded ear flaps attached to said crown member, ear phone supporting devices made of rigid or hard material attached to said ear flaps and provided with horizontally-disposed, elongated openings adapted to receive portions of the ear phones that fit loosely in said openings, and adjustable parts on the ear flaps that can be manipulated to shift the ear phones forwardly and rearwardly in the ear flaps and also hold the ear phones in adjusted position.

7. A protective helmet, comprising a substantially rigid crown member provided at its rear end with a depending neck guard or shield, padded ear flaps hinged to said crown member and separated by open spaces from said neck guard, a member made of elastic webbing or the like, arranged transversely of said neck guard on the inner side of same and having extensions that project outwardly through upright slots in said guard, said extensions having provision for detachably connecting them to the lower end portions of said ear flaps, ear phone supporting devices on said ear flaps having horizontally disposed elongated holes in which the ear phones are adapted to be positioned, and means for adjusting the ear phones forwardly and rearwardly in the elongated holes in said supporting devices

and holding the ear phones in adjusted position in said devices.

8. A protective helmet, comprising a crown member, depending ear flaps on said crown member, and spring arms on said crown member adapted to be arranged in overlapping relationship with said ear flaps to exert inward pressure on same.

9. A protective helmet, comprising a crown member, ear flaps on said crown member, means for mounting ear phones on said ear flaps, and adjustable spring arms on said crown member adapted to be positioned so as to press the flaps and ear phones inwardly towards the user's head.

10. A protective helmet provided with an ear flap, a part on said flap provided with an opening into which an ear phone can be inserted with a portion of the ear phone projecting outwardly through said opening, said opening being of considerably greater size than the outwardly-projecting portion of the ear phone so as to permit the ear phone to be shifted relatively to the ear flaps into a plurality of different positions, and a transversely-adjustable part on the ear flap that snugly surrounds the outwardly-projecting portion of the ear phone and holds the ear phone in its selected position.

11. A protective helmet provided with an ear flap having a hole of a size sufficient to receive the inner end portion or ear contacting portion of an ear phone, a substantially rigid or inflexible holder on the exterior of said flap provided with a horizontally-disposed, elongated opening out through which a portion of the ear phone extends, the vertical dimension of said opening being less than the diameter of the said hole in the ear flap, and a means on the flap for preventing the ear phone from moving inwardly or outwardly relatively to the flap and for adjusting the ear phone forwardly or rearwardly relatively to the ear flap, into a position selected by the user.

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