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SAFETY HELMET WITH RELEASABLE EYESHIELD

Filed Jan. 2, 1970

3 Sheets-Sheet 1

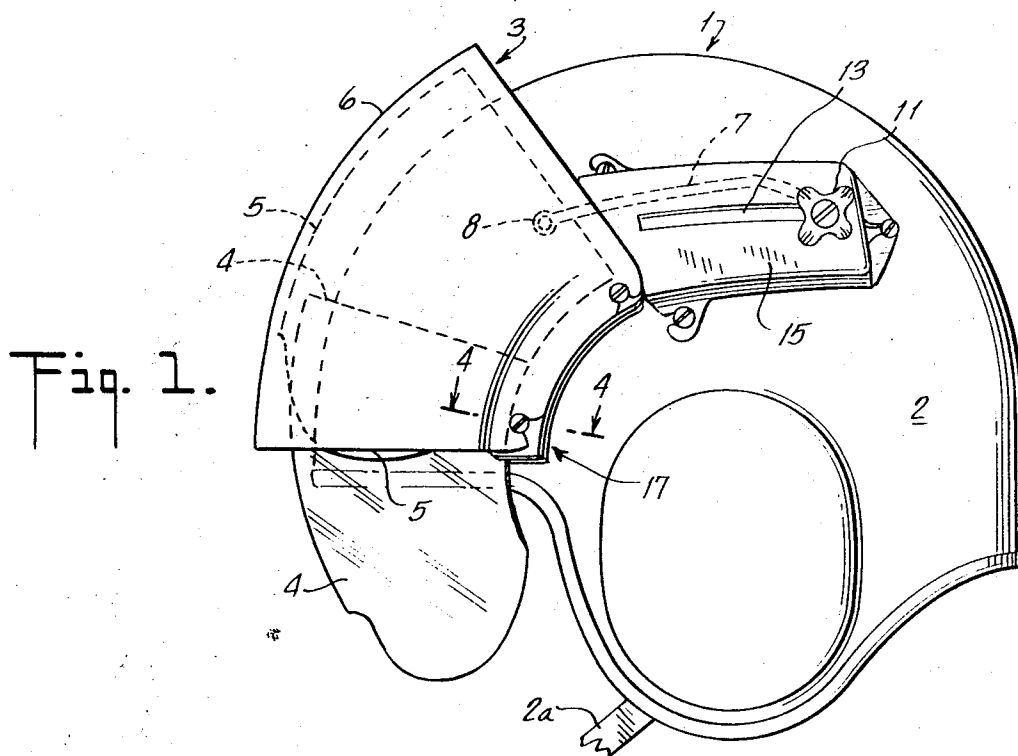


Fig. 1.

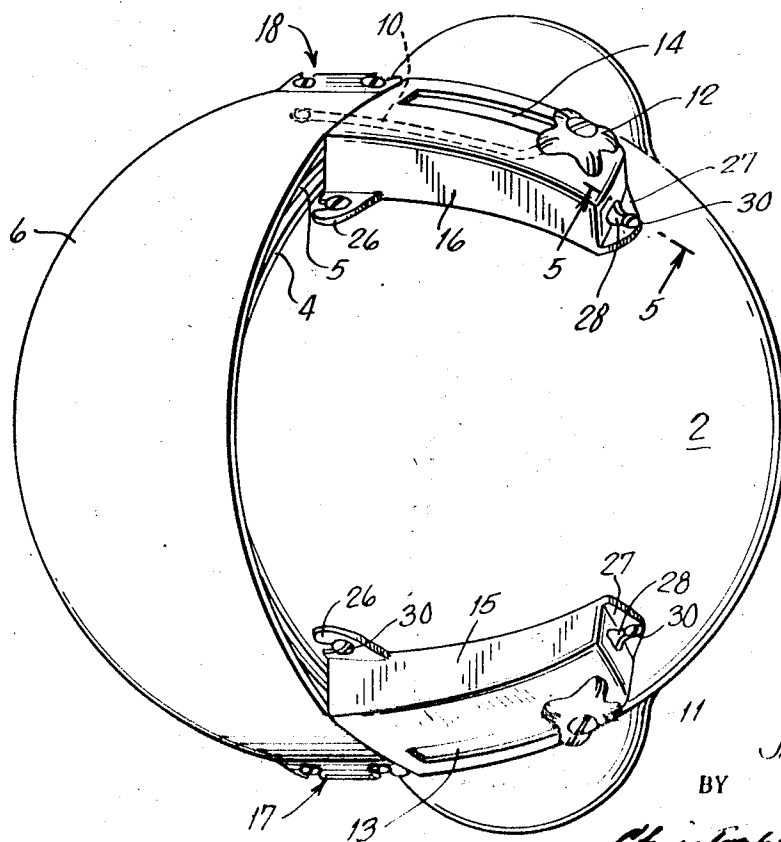


Fig. 2.

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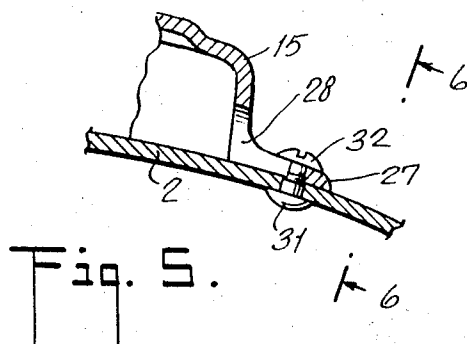
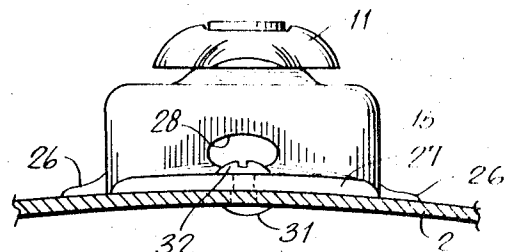
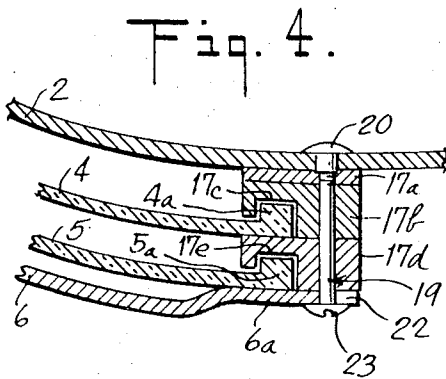
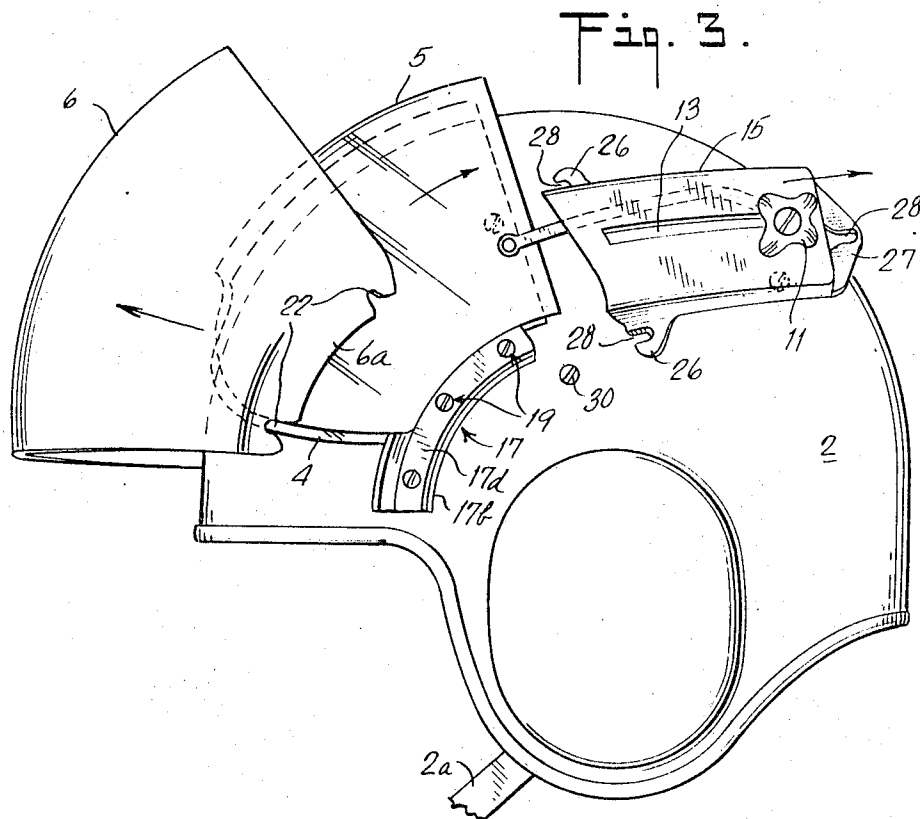
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3,585,638

SAFETY HELMET WITH RELEASABLE EYESHIELD

Filed Jan. 2, 1970

3 Sheets-Sheet 2



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SAFETY HELMET WITH RELEASABLE EYESHIELD

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U.S. Cl. 2—6

16 Claims

ABSTRACT OF THE DISCLOSURE

A safety helmet having an eyeshield assembly including at least one movable eyeshield, a cover for the eyeshield, and a housing for a movable handle connected to the eyeshield, secured to the helmet in such manner as to be detachable therefrom when subjected to lifting forces exerted by unusual conditions of air flow or pneumatic pressure that might otherwise tend to twist the wearer's head or displace the helmet. In one embodiment, the cover and housing have open-ended slots and are secured to the helmet by screws disposed in the slots, which are so oriented that the aforementioned lifting forces can slide the cover and housing out of engagement with the screws, releasing the eyeshield assembly from the helmet.

BACKGROUND OF THE INVENTION

The present invention relates to safety helmets having movable eyeshields, and more particularly to new and improved arrangements for releasably mounting an eyeshield assembly on a helmet.

In present-day safety helmet construction, it is common practice to mount one or a pair of eyeshields on a rigid protective helmet shell, in such manner that the shield or shields can be moved between a shielding position in front of the wearer's eyes and a retracted position above the front of the shell. A cover for protecting the eyeshield in its retracted position, and a housing for a handle connected to the eyeshield, may be also secured to the shell. One example of such construction is disclosed in applicant's copending application, Ser. No. 609,827, filed Jan. 17, 1967, now U.S. Pat. No. 3,495,273.

An eyeshield assembly of this type should ordinarily be securely fixed to the shell. Under some exceptional circumstances, however, it may be desirable to provide for release of the shield and other assembly elements from the helmet. For example, a high rate of air flow over the helmet may produce increased pressure beneath the shield, cover and housing (which are necessarily somewhat spaced from the shell) and/or decreased pressure above these elements, such pneumatic pressure conditions may exert strong lifting forces on the eyeshield assembly, tending to lift or twist the wearer's head or to displace the helmet. Release of the assembly in response to the lifting forces would minimize these hazards.

Conventionally, an eyeshield assembly is secured to a helmet shell by screws, rivets, snap fasteners or the like, in such manner as to require deliberate manipulation operations (with or without the use of tools) for detachment of the shield and other assembly elements from the shell. These fastening arrangements are satisfactory from the standpoint of affording secure attachment of the assembly to the shell, but they do not enable detachment of the assembly elements by the aforementioned lifting forces, and hence they present some degree of hazard to the wearer when the helmet is worn under conditions that may produce such lifting forces.

SUMMARY OF THE INVENTION

An object of the present invention is to provide a safety helmet having a new and improved eyeshield assembly

wherein elements that may be subjected to strong lifting forces exerted by unusual air flow and pneumatic pressure conditions are detachable from the helmet by such lifting forces so as to prevent undesired transmission of the lifting forces to the helmet shell and the wearer's head.

The invention may be embodied in a safety helmet including a helmet shell, an eyeshield, and means for mounting the shield on the shell for movement between shielding and retracted positions, wherein the mounting means includes a member (subject to the aforementioned lifting forces) for retaining the shield on the shell and means fastened to the shell and engaging a portion of the retaining member for securing that member to the shell. Stated broadly, in this construction, the invention contemplates provision of a retaining member and securing means therefor, mutually adapted to be disengaged, for release of the member and the shield from the shell, by a finite force exerted in the direction in which the lifting forces act on the portion of the member engaged by the securing means.

In one form of the invention, the retaining member is frictionally engaged by the securing means and is slidable relative thereto (against the force of frictional engagement), for disengagement from the securing means, by a finite force exerted in the direction in which the lifting forces act. Thus, the securing means may comprise screws, and the retaining member may have open-ended slots so oriented that they open in a direction opposite to the direction of the lifting forces. The screws, received in the slots with their heads overlying the retaining member adjacent to the slots, positively retain the engaged portion of the retaining member against movement normal to the helmet shell, and frictionally hold the member on the shell. However, owing to the orientation of the slots, the retaining member is slidable (in a direction generally tangential to the shell) out of engagement with the screws, when subjected to a lifting force of sufficient strength.

As particular features of the invention, there may be provided an eyeshield assembly including a cover for the shield and/or a housing for a handle for the shield, with securing means therefor, mutually adapted for disengagement (in the manner just described, with reference to the retaining member) by lifting forces as mentioned above. In specific embodiments, the cover and/or the housing structure may constitute a retaining member for the eyeshield in such assembly.

One especially advantageous application of the invention is in eyeshield assemblies that incorporate two separately movable shields, e.g. one tinted and the other clear, for use under different conditions of illumination. In such assemblies, one shield is disposed outwardly of the other, and a cover is commonly provided for protection of both shields in the retracted position. The outer one of the shields, and also the cover, must be substantially spaced from the helmet shell to accommodate the inner shield; this spacing renders the cover and outer shield particularly vulnerable to lifting forces, e.g., as created by high rates of air flow over the helmet. The present invention may be embodied in such assemblies to provide for release of the cover and outer shield, and in some cases the inner shield as well, in response to these lifting forces.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of a safety helmet equipped with an eyeshield assembly embodying the present invention in a particular form;

FIG. 2 is a top view of the helmet of FIG. 1;

FIG. 3 is a side view as in FIG. 1, illustrating the separation of eyeshield assembly elements from the helmet shell;

FIG. 4 is an enlarged fragmentary sectional view taken along the line 4—4 of FIG. 1;

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FIG. 5 is an enlarged fragmentary sectional view taken along the line 5—5 of FIG. 2;

FIG. 6 is an end view of part of the eyeshield assembly of the helmet of FIGS. 1-5, taken along the line 6—6 of FIG. 5;

FIG. 7 is a side view of a safety helmet equipped with an eyeshield assembly incorporating a modified embodiment of the present invention;

FIG. 8 is an enlarged fragmentary sectional view taken along the line 8—8 of FIG. 7; and

FIG. 9 is a perspective view of one element of the assembly of FIGS. 7-8.

DETAILED DESCRIPTION

FIG. 1 shows a safety helmet 1 of a type generally as disclosed in the aforementioned copending application, Ser. No. 609,827, and incorporating an embodiment of the present invention. The helmet 1 includes a rigid molded protective shell 2, fitted with internal rigging (not shown) of conventional form, which accommodates the head of a wearer and which is suitable for mounting associated equipment required by the wearer during its use. As shown, the helmet 1 is fitted with an eye shield assembly 3, including two eyeshields 4 and 5 and a substantially rigid protective cover plate 6, all of which are held on the front of the helmet 1 by a mounting arrangement in accordance with the present invention, as hereinafter described. The two eyeshields and the cover plate are curved to conform generally to the curvature of the helmet shell front portion and are disposed outwardly of that front portion, in forwardly spaced relation thereto. A chin strap 2a may be provided for securing the shell 2 on a wearer's head.

The eyeshields 4 and 5 (of which one may be tinted and the other clear, for use under different conditions of illumination) are translatably mounted with shield 5 spaced outwardly of shield 4, i.e., with respect to the shell 2. Each of these shields is adapted to move independently between an extended, eye-shielding position wherein it is located in the wearer's field of vision, and a retracted position wherein it is located above the forward part of the shell 2 within a space defined between the shell and the forwardly spaced cover plate 6. Eyeshield 5 is moved between the extended and retracted positions by a rigid link 7 attached on one end by an eyelet 8 to the upper corner of the eyeshield 5. A similar link 10 (FIG. 2) moves eyeshield 4. The two links 7 and 10 are connected at their opposite ends to respective knob-shaped actuating handles 11 and 12. The handles 11 and 12 are adapted to ride in accommodating slots 13 and 14, respectively, provided in matching housings 15 and 16 which are attached to the shell 2.

More particularly, the eyeshields 4 and 5 in their movement on the helmet 1 are slidably supported at their side edges in grooves formed in a pair of tracks 17 and 18, attached to the shell 2 on opposite sides of the fore-and-aft center line of the shell. As shown most clearly in FIGS. 3 and 4, the track 17 positioned on the left-hand side of the shell 2 comprises a curved spacer plate 17a positioned on the outer surface of the shell, a curved inner track member 17b defining an outwardly-opening groove 17c for receiving the left-hand side edge 4a of the inner eyeshield 4, and a curved outer track member 17d (identical to member 17b) defining a second outwardly-opening groove 17e for receiving the left-hand side edge 5a of the outer eyeshield 5. Member 17b overlies spacer plate 17a, while member 17d overlies member 17b and the inner groove 17c so as to retain the eyeshield edge 4a within the last-mentioned groove against outward movement away from the shell; both grooves 17c and 17e are open at their extremities to permit the eyeshields to be slidably withdrawn from the grooves. Track 18, on the right-hand side of the shell 2 (and not shown in FIGS. 3 and 4) is identical to track 17 except that is arranged to receive the right-hand side edges of the two eyeshields.

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The cover plate 6 is so dimensioned that its opposite side edge portions 6a respectively bear against the outer surfaces of the two tracks 17 and 18, overlying the outer groove 17e of track 17 and the corresponding outer groove of track 18 so as to retain the side edges of the outer shield 5 in these grooves against outward movement away from the helmet shell. Track 17 is secured to the shell 2 by fastening elements shown as three screws 19, spaced longitudinally along the track. The shank of each of these screws projects inwardly through aligned holes in the members 17d, 17b and spacer plate 17a and through a hole in the shell 2, where it is threadably engaged by a nut 20 disposed at the inner surface of the shell. Track 18 is secured to the shell in like manner by three similar screws 19. As hereinafter further explained, certain of the screws 19 also serve to secure the cover plate 6 to the shell 2, in a particular arrangement in accordance with the present invention.

The two eyeshields 5 and 4 are moved slidably along the tracks 17 and 18, between their shielding and retracted positions, by manipulation of their respective handles 11 and 12. Handle 11 and its associated housing 15 are mutually adapted (e.g. in known manner) for releasable interengagement at any of various positions along the slot 13, for selectively holding the eyeshield 5 in the shielding, retracted, or other position. Handle 12 and housing 16 are similarly mutually adapted for releasable interengagement to selectively hold the shield 4 in any desired position. By way of specific example, one suitable form of means for effecting such interengagement of eyeshield handles and housings is disclosed in applicant's aforementioned copending U.S. application Ser. No. 609,827, to which reference may be made for a fuller description thereof.

It will be seen that while the eyeshield assembly 3 on the front of the helmet 1 is more or less streamlined and not particularly cumbersome, it may still be subjected to strong lifting forces created by unusually high rates of air flow over the forward portion of the shell, such as may be encountered on occasion, especially in use of the helmet by aviators. The outer eye shield 5, which must be substantially spaced from the shell 2 to accommodate the inner shield 4, and the cover plate 6, which must be even further spaced from the shell to accommodate both eye shields, are particularly vulnerable to such lifting forces. For example, rapid rearwardly-directed air flow over the eye shield assembly may locally increase the pressure beneath shield 5 and plate 6, and/or may decrease the pressure above the curved upper surfaces of these structures, in accordance with well-known aerodynamic principles. Lifting forces thus exerted on the eye shield assembly by exceptional air flow and pneumatic pressure conditions, if transmitted to the shell, may cause discomfort or even injury to the wearer by lifting or wrenching his head (to which the helmet shell is secured by the chin strap 2a) or may dislodge the helmet from its proper position on his head. The features of the present invention now to be described as embodied in the helmet of FIGS. 1-6 provide a special arrangement for mounting the eye shield assembly elements subject to these lifting forces, in such manner that the last mentioned elements are ordinarily firmly secured to the helmet, but become separated or released therefrom (without need for any action on the part of the wearer) in response to lifting forces of predetermined magnitude. Such release substantially prevents transmission of the lifting forces to the shell, and hence minimizes the hazard of discomfort or injury to the wearer.

In accordance with the invention, the left-hand side edge portion 6a of the cover plate 6 has two open-ended slots 22, both opening through the adjacent side edge of the cover plate (i.e. to the left, in the direction away from the fore and aft center line of the helmet shell) and respectively positioned, adjacent to the upper and lower edges of the cover plate, for register with the upper and lower screws 19 that secure the track 17 to the shell. The

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right-hand side edge portion of the cover plate similarly has two open-ended slots 22 opening to the right (away from the helmet center line) through the adjacent plate side edge and respectively positioned for register with the upper and lower screws 19 that secure the track 18 to the shell.

Each of the track-securing screws 10 has a head 23 at its outer extremity. In the set of three screws securing each of the tracks to the helmet shell, the head of the middle screw is flush with the outer track member 17d, but the heads of the upper and lower screws are both disposed outwardly of the outer track member, and the cover plate slots 22 respectively receive the shanks of these screws. The heads of the last-mentioned screws are tightened against the cover plate, so that these screw heads frictionally engage the outer surface of the cover plate adjacent to the slots 22.

The screw heads 23 positively secure the cover plate side edges against movement in a direction normal to the subjacent shell surface, and the engagement of the sides and closed ends of the slots 22 with the screw shanks positively prevents downward or rearward movement of the cover plate side edge portions relative to the shell 2. The frictional engagement of the screw heads 23 with the cover plate 6 ordinarily restrains that plate against movement in any direction relative to the shell. However, since the slots 22 on each side edge of the cover plate are open-ended and are oriented to open in a direction away from the fore and aft center line of the helmet, each side edge portion of the cover plate is slidably movable toward the fore and aft center line of the helmet, in a generally forward and upward direction tangential to the helmet shell, if a force acting in such direction, and sufficient to overcome the frictional grip of the screw heads, is applied to the cover plate side edge portion. By such sliding movement, the cover plate side edges can become fully disengaged from the screws 22, the open ends of the slots permitting such disengagement; and in this way the cover plate 6 may be completely released from attachment to the shell 2.

To accommodate movement of the handles 11 and 12 along the respective slots 13 and 14, the outer walls of the housings 15 and 16 are spaced from the outer surface of the helmet shell. Further in accordance with the invention, the housing 15 (which supports handle 11, connected to the outer eye shield 5) bears a pair of tabs 26, positioned on opposite sides of the forward portion of the housing in contiguous relation to the shell outer surface, and a further tab 27 extending from the rear of the housing, also in contiguous relation to the shell. Each of these tabs has an open-ended slot 28, all three of the slots 28 being similarly oriented and opening forwardly. Three screws 30 are respectively disposed in the slots 28, having shanks extending inwardly through the slots 28 and through holes in the helmet shell 2, where they are threadably engaged by nuts 31 disposed at the inner surface of the shell (FIGS. 5 and 6). The screws have heads 32 which are tightened against the tabs, so as to frictionally engage the outer surfaces of the tabs adjacent to the slots 28. The screw heads positively restrain the tabs of the housing 15 against movement normal to the subjacent shell surface, and the engagement of the sides and closed ends of the slots 28 with the screw shanks positively restrains the housing 15 against forward or sideward movement relative to the shell. However, the housing 15 is held against rearward movement (in a direction tangential to the shell) only by the frictional engagement of the screw heads 32 with the tabs 26, 27; the forwardly-opening slots 28 are shaped and dimensioned to permit sliding movement of the housing in such rearward direction relative to the screws, enabling the tabs 26, 27 to be fully disengaged from the screws 30 by a rearwardly directed force of sufficient magnitude to overcome the frictional grip of the screws.

As shown in FIG. 2, the housing 16 (carrying the handle

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12, connected to the inner eye shield 4) may be similarly secured to the shell 2 by screws 30 positioned in forwardly-opening slots 28 in tab portions 26, 27 of the housing 16.

In use of the described helmet, the shell 2 is placed on the wearer's head and secured thereto by the chinstrap 2a. When the helmet is in place, the eyeshields 4 and/or 5 are manipulated as desired by means of the handles 11, 12. Under ordinary conditions, the eye shield assembly, including the shields 4 and 5 as well as the cover plate 6 and housings 15 and 16, is secured and fixedly held on the helmet shell by means of the screws 19 and 30.

It sometimes happens during use of the helmet, that conditions are encountered producing a high rate of rearwardly directed air flow over the helmet. Such air flow may exert a strong lifting force on the cover plate 6 and/or other parts of the eye shield assembly. This lifting force tends to cause the cover plate to bulge outwardly at the center, away from the helmet shell, pulling the side edge portions of the cover plate generally forwardly and upwardly toward the fore and aft center line of the helmet.

If this forwardly directed lifting force, acting on the side edges of the cover plate, is of sufficient strength, the plate side edges will slide forwardly against the frictional grip of the screws 19 and will ultimately slide out of engagement with the screws, owing to the open-ended configuration and orientation of the slots 22. The cover plate 6 will thus be released from the helmet, separating completely from the shell 2.

The release of the cover plate 6 from the shell opens the outer grooves of the tracks 17 and 18, and thus frees the side edges of the outer eyeshield 5 (which may also be subject to lifting forces in the described circumstances) for outward movement away from the tracks and the shell. However, the eye shield 5 is additionally connected to the shell through the link 7, handle 11 and housing 15.

The conditions that produce the described lifting forces on the cover plate 6 and eyeshield 5 also tend to produce a generally rearwardly directed lifting force on the housing 15. This force, if of sufficient magnitude, causes the housing 15 to slide rearwardly over the helmet shell, against the frictional grip of the screws 30, and ultimately disengages the housing tabs 26, 27 from those screws, owing to the configuration and orientation of the open-ended slots 28. The housing 15, like the cover plate 6, is thus released from the shell. If the cover plate separates from the shell while the housing 15 is still attached, the outer shield 5 (lifting out of the track grooves) may be subjected to rearwardly directed aerodynamic forces which are transmitted to the housing 15 through the link 7 and exert an additional rearward force on the housing, tending to promote its separation from the shell.

Once the cover plate 6 and housing 15 have been detached from the shell in the manner described, the eye shield 5 is no longer connected to the shell in any way. Thus the eyeshield 5 is completely separated from the shell concomitantly with separation of the cover plate and the housing 15. In consequence, the shell is no longer subjected to lifting forces from the last-mentioned shield, housing and cover plate.

Stated in other words, aerodynamic lifting forces exerted on the cover plate 6 act on the cover plate side edge portions in directions that tend to pull those side edge portions out of engagement with the screws 19, while the lifting forces exerted on the housing 15 act on its tab portions in a direction that tends to pull the tab portions out of engagement with the screws 30. Thus, lifting forces of sufficient magnitude will effect complete release of the cover and housing 15, and also the shield 5, from the shell. The magnitude of lifting force required to effect such release is determined by the degree of frictional engagement of the screws 19 and 30 with the cover plate and housing. Accordingly, that force may be selected by ap-

propriate (tightening or loosening) adjustment of the screws.

The lifting forces described above do not effect release of the outer track member 17d and the corresponding outer member of the track 18. Consequently, the edges of the inner shield 4 are not freed for outward movement from the inner track grooves. In many cases, separation of the outer shield 5 and the cover plate 6 from the helmet will be sufficient to avoid subjection of the wearer to hazardous lifting forces, since these are the elements spaced farthest away from the helmet and therefore most vulnerable to aerodynamic lifting. However, if the housing 16 (connected to the innershield 4) is also releasably mounted as described above, strong lifting forces acting on the eye shield assembly may effect rearward movement of the housing 16, detaching it from the shell. The rearward movement of the housing 16 tends to pull the inner eye shield 4 out of the tracks through the open upper ends of the inner track grooves, thereby releasing the inner shield as well as the outer shield from the helmet. Since the heads of the upper and lower screws 19 securing each track to the shell are spaced outwardly from the tracks to accommodate the cover plate 6, release of the cover plate from the shell permits some degree of relative movement of the inner and outer track members, especially near their ends; this play of the track members may facilitate release of the inner eyeshield.

As the eyeshield cover plate 6 tends to be subjected to loosening stresses in ordinary use more often than the other parts of the eyeshield assembly 3, by virtue of its position, the cover plate may, in some instances, tend to work loose from the screws 19, and it may be desirable to provide means for securing the cover in place. One suitable form of supplemental cover-securing means in accordance with the invention is shown in FIGS. 7-9 as incorporated in a helmet otherwise identical to that of FIGS. 1-6. In the embodiment of FIGS. 7-9, two elongated gripping elements 34 and 35 forming clips are provided on each of the tracks 17 and 18. Each pair of gripping elements is secured to the subjacent track by the screws 19, with the two elements 34 and 35 superposed to define a slit that opens toward the shell fore-and-aft centerline to receive one side edge portion 6a of the cover 6. As shown particularly in FIG. 8, referring to the left-hand track 17, element 34 is fitted between the cover edge portion 6a and the outer track member 17d and element 35 is positioned outside the cover edge portion 6a and is held in gripping relationship therewith by means of the screw heads 23. The two elements 34 and 35 are contoured appropriately to conform to the contour 6b in the cover 6 near its edge, and the inner clip piece 34 in engaging the contour 6b acts to resist movement of the cover edge 6a out of engagement with the screws 19. The elements 34 and 35, however, are resiliently flexible so as to permit sliding movement of the cover edge portion 6a toward the fore-and-aft center line of the shell 2 and thus to release the cover when sufficient force acts on the cover 6 to free the edge portion 6a from the grip of the screws 19.

It is to be understood that the invention is not limited to the features and embodiments hereinabove specifically set forth, but may be carried out in other ways without departure from its spirit.

I claim:

1. A safety helmet, including

- (a) a shell adapted to receive the head of a wearer;
- (b) an eyeshield; and

(c) means for mounting said shield on said shell for guided movement between a shielding position in front of the wearer's eyes and a retracted position above the forward portion of said shell, said means including a member for retaining said shield on said shell, said member being separate from said shell and subject to lifting forces exerted by air flow and

pneumatic pressure at said shell forward portion, and means fastened to said shell and engaging a portion of said member for securing said member to said shell;

wherein the improvement comprises:

- (d) said portion of said member and said securing means being mutually adapted to be disengaged, for release of said member and said shield from said shell, by a predetermined force exerted in the direction in which said lifting forces act on said portion of said member.

2. A helmet as defined in claim 1, wherein said portion of said member is frictionally engaged by said securing means and is slidable relative to said securing means, for disengagement therefrom, in the direction in which said lifting forces act on said portion of said member.

3. A helmet as defined in claim 2, wherein said securing means comprises means for preselecting the force of frictional engagement between said portion of said member and said securing means.

4. A helmet as defined in claim 2, wherein said portion of said member includes an edge of said member having at least one slot opening through said edges in a direction opposite to that in which said lifting forces act on said portion of said member, and wherein said securing means includes at least one rigid fastening element having a shank extending through said slot and fixed to said shell, and a head overlying and frictionally engaging an outer surface of said portion of said member adjacent to said slot.

5. A safety helmet, including

- (a) a shell adapted to receive the head of a wearer;
- (b) an eyeshield;

(c) means for mounting said shield on said shell for guided movement between a shielding position in front of the wearer's eyes and a retracted position above the forward portion of the shell;

(d) a cover plate extending across and in spaced relation to the forward portion of said shell and defining therewith a downwardly-opening recess for receiving said shield in retracted position, said cover plate being subject to lifting forces exerted by air flow and pneumatic pressure at the forward portion of said shell; and

(e) means fastened to said shell and engaging a portion of said cover plate for securing said plate to said shell;

wherein the improvement comprises:

- (f) said portion of said plate and said securing means being mutually adapted to be disengaged, for release of said cover plate from said shell, by a predetermined force exerted in the direction in which said lifting forces act on said portion of said plate.

6. A helmet as defined in claim 5, wherein said securing means comprises means frictionally engaging opposite side edge portions of said plate, and wherein said plate side edge portions are slidable forwardly toward the fore-and-aft center line of said shell for disengagement from said securing means.

7. A helmet as defined in claim 6, wherein said plate side edge portions have slots each opening through the adjacent side edge of the plate in a direction away from said shell fore-and-aft center line, and wherein said securing means comprises plural rigid fastening elements respectively associated with said slots, each of said fastening elements having a shank extending through one of said slots and fixed to said shell and a head overlying and frictionally engaging the outer surface of said plate adjacent to the slot through which the shank extends.

8. A helmet as defined in claim 6 comprising means for fixing said shank to said shell and cooperating with said shank to permit the preselection of the force of frictional engagement between said head and said outer surface of said plate.

9. A helmet as defined in claim 6, wherein said securing means comprises two pairs of elongated gripping elements respectively extending along opposite side edges of said cover plate, each pair of said gripping elements being fixedly connected to said shell in superposed relation to each other to define a slit between them opening toward said shell fore-and-aft center line for receiving one side edge of said cover plate, each pair of said gripping elements frictionally gripping the plate side edge received between them.

10. A helmet as defined in claim 6, wherein said mounting means comprises a pair of tracks respectively secured to opposite sides of said shell fore-and-aft center line, each of said tracks defining an outwardly opening groove for receiving one side edge of said shield, and wherein said cover plate side edge portions respectively extend over said tracks to retain the side edges of the shield within the respective track grooves for guided sliding movement of the shield between said shielding and retracted positions, said plate and tracks being so arranged that release of said plate from said securing means effects release of said shield from said tracks.

11. A helmet as defined in claim 10, further including

(a) housing structure extending rearwardly over said shell from said cover plate and defining an elongated slot;

(b) a handle slidably movable along said slot;

(c) link means for connecting said handle to said shield so that movement of said handle effects corresponding movement of said shield between said shielding and retracted positions; said handle being releasably engageable with said housing structure in each of plural positions along said slot for selectively retaining said shield in each of a corresponding plurality of positions; and

(d) means fastened to said shell and engaging a portion of said housing structure for securing said housing structure to said shell;

wherein the improvement comprises:

(e) said portion of said housing structure and said housing structure securing means being mutually adapted to be disengaged, for release of said housing structure from said shell, by a rearwardly directed predetermined force exerted by air flow and pneumatic pressure acting on said housing structure.

12. A helmet as defined in claim 11, wherein said portion of said housing structure has at least one forwardly-open slot, and wherein said housing structure securing means comprises at least one rigid fastening element having a shank extending through said last-mentioned slot and fixed to said shell, and a head overlying and frictionally engaging the outer surface of said housing structure portion adjacent to said last-mentioned slot, said housing structure portion being slidable rearwardly for disengagement from said fastening element.

13. A safety helmet, including

(a) a shell adapted to receive the head of a wearer;

(b) first and second eyeshields;

(c) guide means fixed on the shell and receiving the edges of both eye shields for guided movement of each eye shield between a shielding position in front of the wearer's eyes and a retracted position above the forward portion of the shell;

(d) a cover plate extending across and in spaced relation to the forward portion of said shell and defining therewith a downwardly-opening recess for receiving said shields in retracted position, said cover plate being subject to lifting forces exerted by air flow and pneumatic pressure at the forward portion of said shell;

(e) means fastened to said shell and engaging a portion of said cover plate for securing said plate to said shell;

(f) a pair of housing structures extending rearwardly

over said shell from said cover plate and each defining an elongated slot;

(g) a pair of handles respectively slidably movable along the slots;

(h) a pair of link means for respectively connecting said handles to said shields so that movement of each said handle effects corresponding movement of the shield to which it is connected between said shielding and retracted position, each said handle being releasably engageable with its associated housing structure in each of plural positions along the slot of the housing structure for selectively retaining the shield to which it is connected in each of a corresponding plurality of positions; and

(i) means fastened to said shell and engaging portions of said housing structures for securing said housing structures to said shell;

wherein the improvement comprises:

(j) said portion of said plate and said plate-securing means being mutually adapted to be disengaged, for release of said cover plate from said shell, by a predetermined force exerted in the direction in which said lifting forces act on said portion of said plate; and

(k) said portions of said housing structures and said housing structure securing means being mutually adapted to be disengaged, for release of said housing structures from said shell, by a rearwardly directed predetermined force exerted by air flow and pneumatic pressure acting on said housing structures.

14. A helmet as defined in claim 13, wherein said guide means comprises a pair of tracks respectively secured to opposite sides of said shell fore-and-aft center line, each of said tracks defining an inner groove for receiving one side edge of said first eye shield, and an outwardly opening outer groove for receiving one side edge of said second eye shield, and wherein said cover plate has side edge portions respectively extending over said tracks to retain the side edges of said second eye shield within the outer grooves of the respective tracks, said plate and tracks being so arranged that release of said plate from said securing means effects release of said shield from said tracks.

15. A safety helmet, including

(a) a shell adapted to receive the head of a wearer;

(b) an eyeshield;

(c) guide means fixed on the shell and receiving the edges of said shield for guided sliding movement of the shield between a shielding position in front of the wearer's eyes and a retracted position above the forward portion of the shell;

(d) a cover plate mounted on and in spaced relation to the forward portion of said shell and defining therewith a downwardly-opening recess for receiving said shield in retracted position;

(e) housing structure extending rearwardly over said shell from said cover plate and defining an elongated slot;

(f) a handle slidably movable along said slot;

(g) link means for connecting said handle to said shield so that movement of said handle effects corresponding movement of said shield between said shielding and retracted positions; said handle being releasably engageable with said housing structure in each of plural positions along said slot for selectively retaining said shield in each of a corresponding plurality of positions; and

(h) means fastened to said shell and engaging a portion of said housing structure for securing said housing structure to said shell;

wherein the improvement comprises:

(i) said portion of said housing structure and said housing structure securing means being mutually adapted to be disengaged, for release of said housing structure from said shell, by a rearwardly directed

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predetermined force exerted by air flow and pneumatic pressure acting on said housing structure.

16. A safety helmet including:

- (a) a shell adapted to receive the head of a wearer;
 - (b) an eyeshield; and
 - (c) means for mounting said shield on said shell for guided movement between a shielding position in front of the wearer's eyes and a retracted position above the forward portion of said shell, said means including a member for retaining said shield on said shell, said member being separate from said shell and subject to lifting forces exerted by air flow and pneumatic pressure at said shell forward portion, and means fastened to said shell and engaging a portion of said member for securing said member to said shell;
- wherein the improvement comprises:
- (d) said portion of said member and said securing means being mutually disposed and adapted for positively holding said portion of said member against movement away from said shell in a direction normal

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to the shell surface adjacent to said securing means, and only frictionally holding said portion of said member against movement in a direction, substantially tangential to said shell surface adjacent to said securing means, in which said lifting forces act on said portion of said member, to permit disengagement of said member from said securing means upon application of a predetermined lifting force to said member.

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