

Nov. 19, 1957

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2,813,271

HEADGEAR WITH RETRACTABLE EYE SHIELD

Filed Aug. 29, 1955

2 Sheets-Sheet 1

FIG. 1

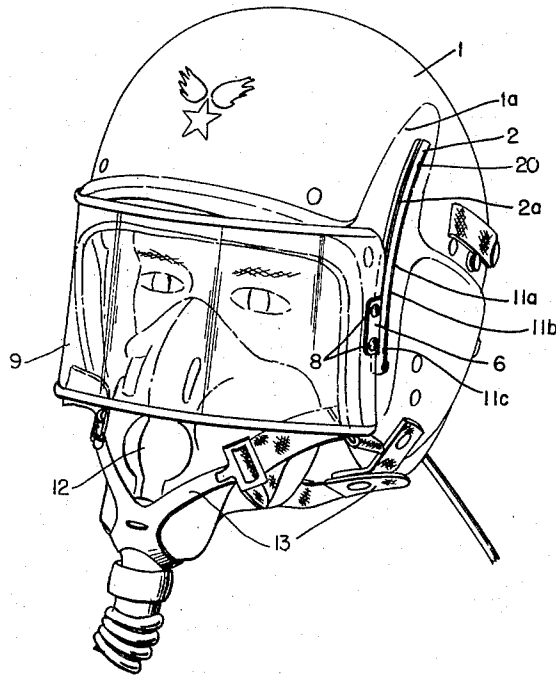
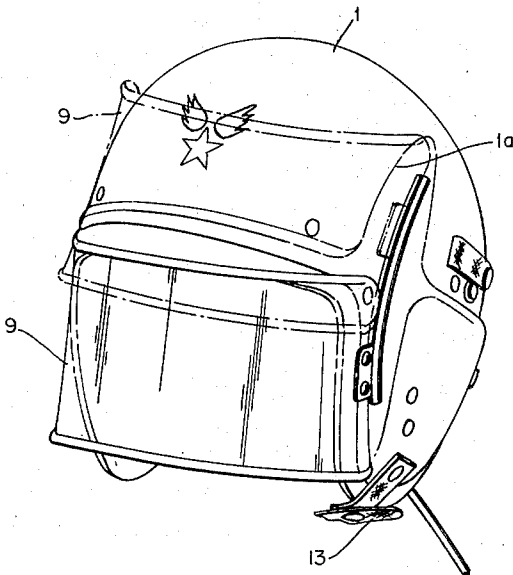


FIG. 2



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FIG. 5

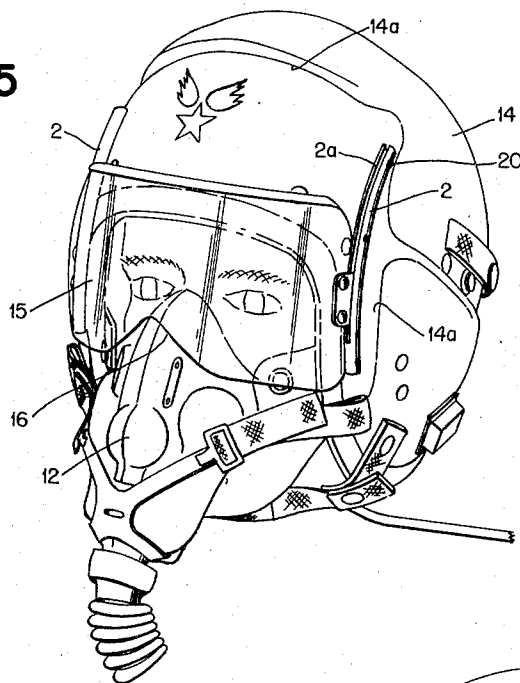


FIG. 3

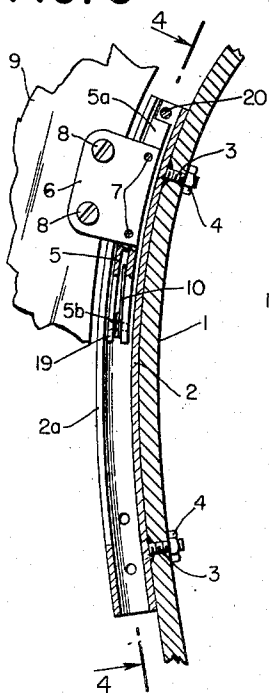


FIG. 4

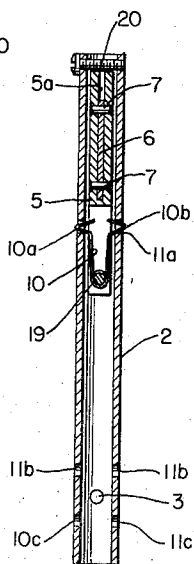
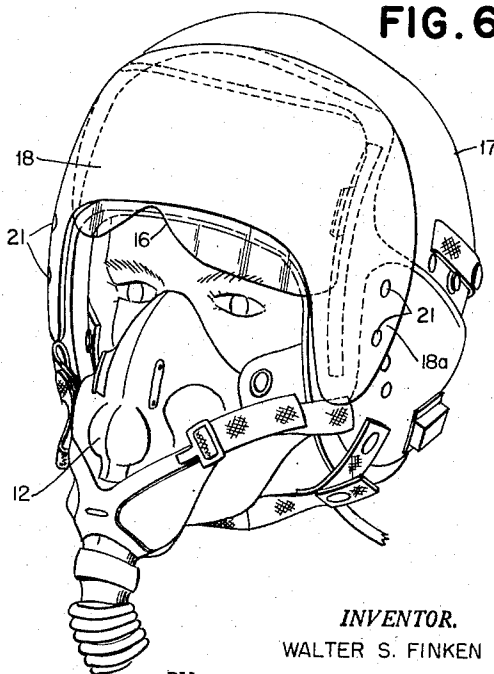


FIG. 6



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HEADGEAR WITH RETRACTABLE EYE SHIELD

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Leonard P. Frieder, Great Neck, N. Y.

Application August 29, 1955, Serial No. 531,100

9 Claims. (Cl. 2-6)

This invention relates to headgear of the safety type, and particularly to safety helmets provided with retractable eye shields.

The present invention is an improvement on the invention described and claimed in my copending application, Serial No. 468,772, filed November 2, 1954, entitled "Helmet with Retractable Eye Shield."

There is disclosed in said copending application a helmet structure having a recess in the shell over the forehead and an eye shield movable between an active position in front of the wearer's eyes and a retracted position within the recess.

Safety helmets of the type described have a shell which is spaced from the wearer's head throughout the periphery of the shell. The provision of a recess in such a shell to receive an eye shield necessarily reduces the clearance between the shell and the wearer's head. The shell is supported on the head usually by means of a rigging which is capable of maintaining the spacing between the head and the shell, even when a blow is struck against the outside of the shell. Any reduction in the normal clearance between the shell and head, such as is occasioned by the presence of a recess to receive an eye shield, increases the possibility of the shell being driven against the wearer's head by an external blow with sufficient force to injure the wearer.

An object of the present invention is to provide a combined headgear and eye shield structure of the type described including an improved recessed shell structure for receiving the retracted eye shield without substantially reducing the clearance between the head and the shell.

Another object of the invention is to provide an improved track and slider structure for supporting an eye shield on the helmet.

Another object is to provide an improved helmet and eye shield structure in which the eye shield is frictionally retained at any point along its path of movement, and is additionally retained with increased friction at certain selected points along its path of movement.

Another object is to provide a combined helmet and eye shield structure in which the eye shield is movable between a retracted position, a first active position usable when the wearer is not using an oxygen mask and an intermediate active position which is usable when the wearer is using an oxygen mask.

Another object is to provide an improved track and slider structure for supporting a slidable panel.

The foregoing and other objects of the invention are attained in the structures disclosed herein. In one of those structures, the helmet shell is provided with two relatively small shallow recesses located above and outwardly of the temples of the wearer. One of a pair of tracks for slidably supporting the eye shield is mounted along each of these two shallow recesses. The eye shield is shaped to extend across in front of the wearer's face and outside the helmet shell. Each edge of the eye shield has attached to it a slider which is received in one of the tracks.

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In another modification of the invention, a shallow recess is provided extending across the entire front of the shell. The use of this shallow recess reduces the clearance between the shell and the head only slightly, but is nevertheless effective to reduce the overall dimensions of the helmet and shield assembly, particularly when the shield is in a retracted position.

The improved track and slider structure comprises a slotted tube serving as a track and extending generally parallel to the center line of the helmet shell. The tube is slotted along its front side. A rod slides in the tube and is recessed to receive a spring which bears yieldably against the side of the tube and holds the slider frictionally in any desired position. The spring is provided with a U-shaped end portion and the sides of the tube are provided with openings somewhat smaller in diameter than the U-shaped portion of the spring. This U-shaped spring and the aperture in the tube serve as a detent to retain the shield in any position where such an aperture is provided. In the structures illustrated, three such apertures are provided, one for the retracted position, one for the position where the shield is all the way down in front of the wearer's face, and one for an intermediate position intended for use when an oxygen mask is being worn along with the shield.

Other objects and advantages of the invention will become apparent from a consideration of the following description and claims, taken together with the accompanying drawings.

In the drawings:

Fig. 1 is a view of a combined helmet and eye shield constructed in accordance with the invention and being worn by a person who also is wearing an oxygen mask;

Fig. 2 is a view similar to Fig. 1, showing the position of the eye shield when no oxygen mask is being worn with it, and its retracted position;

Fig. 3 is a cross-sectional view taken along the line III-III of Fig. 4, showing the sliding track for the eye shield mounted in place on a helmet shell;

Fig. 4 is a sectional view taken on the line IV-IV of Fig. 3, looking in the direction of the arrows;

Fig. 5 is a view similar to Fig. 1 showing a modified form of helmet shell and eye shield construction; and

Fig. 6 is a view similar to Fig. 1 showing another modified form of helmet construction.

Figs. 1 to 4

These figures illustrate a helmet shell 1 which is adapted for mounting on the head of the wearer. For example, the internal rigging which supports the shell 1 on the wearer's head may be similar to that described and claimed in the copending application of Leonard P. Frieder and Walter S. Finken, Serial No. 201,904, filed December 21, 1950, entitled "Headgear Structure."

The shell 1 is provided with a pair of shallow recesses 1a, only one of which appears in the drawings. These recesses are located at the sides of the shell, near the front, and extend upwardly and generally parallel to the center line of the helmet shell over the wearer's forehead. In each of the recesses 1a there is mounted an elongated tube 2 having a slot 2a extending downwardly from the top thereof along its forward side. The tube 2 may be mounted on the shell 1 by means of screws 3 (see Fig. 3), which may be welded to the tube 2, and extend through suitable holes in the shell 1 and are provided with nuts 4 on the inner side of the shell to hold the tube 2 in place. Within the tube 2 there is slidably mounted a rod 5 somewhat smaller in diameter than the inner diameter of the tube 2, and curved concentrically with the tube 2. The rod 5 is provided with a slot 5a extending downwardly from its upper end to receive a plate 6, which is held in the slot 5a by means of pins or rivets 7 (see Fig. 4). The

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plate 6 extends outwardly through the slot 2a and is provided along its outer edge with internally threaded holes to receive screws 8, by which the plate 6 is attached to one edge of a transparent plastic eye shield 9.

The lower end of the rod 5 is provided with a slot 5b extending upwardly at right angles to the plane of the slot 5a. A pin or rivet 19 extends through the rod 5 near the lower end of the slot. A wire spring 10 has one or more coils encircling the pin 9 and two ends extending upwardly from the opposite sides of the pin 19, each of the ends being bent in a broad U-shape, as shown at 10a and 10b in Fig. 4. The sides of the tube 2 are provided with three sets and of apertures 11a, 11b and 11c, for receiving the U-shaped spring ends 10a and 10b in three different positions of the rod 5. The apertures 11a, 11b and 11c are substantially smaller in diameter than the width of the U-shaped ends 10a and 10b, so that those ends do not enter completely into the apertures, and so may be readily forced out of the apertures by merely pushing upwardly or downwardly as the case may be on the plate 6 or the eye shield 9.

The upper set of apertures 11a is adapted to receive the U-shaped ends 10a and 10b when the shield 9 is in its retracted position, shown in dotted lines in Fig. 2. The center set of apertures 11b is adapted to receive the U-shaped ends 10a and 10b when the eye shield 9 is in the position shown in Fig. 1, where the eye shield is being worn at the same time as the oxygen mask 12, held in place on the helmet shell 1 by means of a harness generally indicated by the reference numeral 13.

The third set of apertures 11c fixes the shield 9 in the full active position shown in Fig. 2, which is used when the wearer is not employing an oxygen mask. The oxygen mask would interfere with the eye shield 9 if an attempt were made to use the mask with the eye shield in the position of Fig. 2.

The frictional engagement between the U-shaped spring ends 10a and 10b and the sides of the tube 2 between the apertures is sufficient to hold the eye shield frictionally at any position along its path of travel. The apertures 11a, 11b and 11c provide additional security for maintaining the eye shield fixed in any of the three positions described above.

The upper ends of the tubes 2 are blocked by screws 20 to prevent accidental movement of the sliders 5 out of the ends of the tubes.

Fig. 5

This figure illustrates a modified combined helmet and eye shield structure constructed in accordance with the invention. In this figure, those parts corresponding fully to their counterparts in Figs. 1 to 4 have been given the same reference numerals and will not be further described.

In Fig. 5, there is shown a helmet shell 14 differing from the shell of Fig. 1 by having a wide, shallow recess 14a extending entirely across the forehead covering portion of the helmet and downwardly along the sides. The recess 14a receives not only the slotted tube tracks 2, but also the portion of an eye shield 15 which is nearest the helmet shell.

The recess 14 has a depth sufficiently small that the clearance between the shell and head is substantially unobstructed by the recess, but is nevertheless effective to reduce the overall dimensions of the assembled shell and shield when the shield is in its retracted position.

The eye shield 15 differs from the eye shield 9 of Fig. 1 in having the central portion of its lower edge cut away as shown at 16 to accommodate the oxygen mask 12. This cut away portion of the shield is necessary because the eye shield 15 is located somewhat closer to the face than is the shield 9 of Fig. 1.

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Fig. 6

This figure illustrates a further modified form of helmet structure. There is shown in this figure a helmet 17 having attached over its forehead covering portion a cover 18 having projections 18a which extend downwardly along the sides of the edge of the shell 17. The shell 17 may be of similar construction to either of the shell 1 of Fig. 1 or the shell 14 of Fig. 5. The cover 18 is an added structure which serves simply to enclose the eye shield 9 or 15 when it is in its retracted position. It may be held in place by any suitable means, such as rivets 21.

While I have shown and described certain preferred embodiments of my invention, other modifications thereof will readily occur to those skilled in the art and I therefore intend my invention to be limited only by the appended claims.

I claim:

1. A helmet including a rigid outer shell having internal dimensions large enough to receive the head of a wearer with substantial clearance, an eye shield having a contour generally conforming to that of the forehead covering portion of the shell, and mechanism supporting the shield for manual movement between a shielding position wherein it protects the eyes of a person wearing the helmet and a retracted position adjacent said forehead covering portion, said shield supporting mechanism comprising, for each side of the shield, guide track means on the shell at the corresponding side of the front thereof and extending upwardly from the lower rim of the shell and generally parallel to the fore-and-aft center line of the shell, slider means attached to the edge of the shield and slidably received in the guide track means, a spring device mounted on one of said means and frictionally engaging the other means throughout the path of travel of the shield to hold the shield frictionally in any position along its path, and detent means in said other means defining an aperture to receive a portion of said spring device when the shield is in a predetermined position along said path, to provide increased resistance to movement of said shield from said predetermined position.

2. A helmet as defined in claim 1, including two detent means located at spaced positions along said path to provide increased resistance to movement of said shield from said retracted position and from said shielding position.

3. A helmet as defined in claim 2 including additional detent means to provide increased resistance to movement of the shield from a position intermediate said shielding and retracted positions.

4. A helmet as defined in claim 3, in which said intermediate position is located sufficiently above said shielding position to provide a clearance between the shield and an oxygen mask.

5. A helmet including a rigid outer shell having internal dimensions large enough to receive the head of a wearer with substantial clearance, an eye shield having a contour generally conforming to that of the forehead covering portion of the shell, and mechanism supporting the shield for manual movement between a shielding position wherein it protects the eyes of a person wearing the helmet and a retracted position adjacent said forehead covering portion, said shield supporting mechanism comprising, for each side of the shield, a slotted tube guide track on the outer surface of the shell at the corresponding side of the front thereof and extending upwardly from the lower rim of the shell and generally parallel to the fore-and-aft center line of the shell, a slider rod slidably received in the slotted tube guide track, a plate attached to the edge of the shield and extending through the slot in the track and attached to the rod, and spring means mounted on the rod and frictionally engaging the inside wall of the track throughout the path of travel of the shield to hold the shield frictionally in any position along its path.

6. A helmet as defined in claim 5 including detent means defining an aperture in said track to receive, a

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portion of said spring means when the shield is in a predetermined position along said path, to provide increased opposition to movement of said shield from said predetermined position.

7. A helmet as defined in claim 6, in which said portion of said spring means is broadly U-shaped, and said aperture has a diameter somewhat smaller than the breadth of said U-shaped spring portion.

8. A helmet as defined in claim 7, in which said rod is provided with a slot extending in a plane transverse to the slot in the track, a pin fixed in the rod and extending across the slot therein, said spring means comprising a spring wire looped over the pin and having two projecting ends extending along the slot from the pin, each of said ends being bent to form a broad U, with the curved portion of the U facing outwardly of the slot, said aperture defining means forming diametrically opposed apertures in the wall of said track to receive said U-shaped spring ends.

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9. Apparatus for supporting a panel for sliding movement along a predetermined path, comprising a slotted tube guide track extending parallel to said path, a rod slidable in said track, a plate attached to the rod and projecting through the slot in the track and adapted at its outer end for connection to said panel, spring means mounted on the rod and frictionally engaging the inside wall of the track to hold the shield in any position along its path.

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