

W. H. WILMER. EYE SHIELD. APPLICATION FILED DEC. 26, 1917.

1,336,009.

Patented Apr. 6, 1920. <sup>2 SHEETS-SHEET 2.</sup>







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# UNITED STATES PATENT OFFICE.

WILLIAM H. WILMER, OF WASHINGTON, DISTRICT OF COLUMBIA.

#### EYE-SHIELD.

### 1,336,009.

Specification of Letters Patent.

# Patented Apr. 6, 1920.

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Application filed December 26, 1917. Serial No. 208,816.

# To all whom it may concern:

Be it known that I, WILLIAM H. WILMER, a citizen of the United States, residing at Washington, in the District of Columbia, 5 have invented certain new and useful Im-

provements in Eye-Shields, of which the following is a specification. This invention pertains to shields for the

protection of the eyes. It is primarily de-

- 10 signed for use of soldiers in battle, to protect the eyes against bullets, shell splinters, dirt and gravel thrown by exploding pro-jectiles, and the like, but may also be used by machinists and others to guard against 15 flying chips and particles of metal or other
- material under treatment.

The device consists of a plate or sheet of relatively thin but strong and tough metal,

- such as steel, pressed, hammered, or other-20 wise fashioned into shape to fit the forehead, cheek bones and nose of the wearer, and provided with narrow slits having projecting lips or flanges tending both to stiffen the plate along said slits, and better to guard against the entrance of flying par-ticles or missiles of any kind. The slits 25
- ticles or missiles of any kind. The slits may and usually will be provided with transparent material as glass, celluloid, bakelite, or mica, and in the case of glass 30 or other artificial substances, may be of a
- character to cut out the ultra-violet and infra-red rays in greater or less degree, and thus to prevent injury to the eyes through intense light.
- The device is shown in the accompanying 35 drawings in its simpler form, and also with certain modifications which may or may not be adopted in any given case, as found expedient. In these drawings:
- Figure 1 is a front face view or elevation 40 of the shield;

Fig. 2, a transverse section on the line -2 of Fig. 1;

- Fig. 3, a view looking down from above 45 with the shield in its normal position of use
  - Fig. 4, a perspective view of the same;
  - Fig. 5, a section on the line 5-5 of Fig. 1 showing facing attached;
- Fig. 6, a section on the line 6-6 of Fig. 1; Fig. 7, a similar section on the line 7-7 50 of Fig. 1, said Figs. 6 and 7, however, showing the shield made in two parts, articulated to permit better adjustment to the face of 55 the wearer;

Fig. 8, a view similar to Fig. 4 but showing the shield in two sections hinged or jointed together;

Figs. 9 and 10, views showing variant forms of the joint or connection between 60 the two sections;

Figs. 11 and 12, sectional views through the eye swells or enlargements, showing different modes of applying the transparent material:

Figs. 13 and 14, perspective views of variant forms of attaching device for yieldingly holding the shield in position.

The shield comprises a main plate 1 fashioned to conform more or less closely to the 70 forehead or frontal bone, and having a curved and outwardly inclined saddle or bridge portion 2 to rest upon the nose of the wearer. Just above this saddle there is also, advisably, a bulge or swell 3. The 75 purposes of this swell are, first, to do away with what would otherwise be an unduly flat surface liable to penetration, and to produce instead a rounded deflecting surface; second, to take the pressure off of 80 what is commonly a very sensitive portion of the nose; and finally, to afford space tending to accommodate the bow-spring and holding members of eye-glasses, should the same be used in connection with the shield. 85 On opposite sides of the bridge or saddle portion 2 are swells or enlargements 4, these being located directly in front of and in a very general sense concentric with the eye-ball of the wearer when the shield is in 90 position for use. These swells should be of sufficient size to clear the eye lashes, and may even be large enough to permit the use of spectacles or eye-glasses. Each swell or enlargement 4 is provided with a slit 5, 95 occupying an approximately horizontal position. These slits are preferably formed by making a cut along the medial line of the intended opening, and a short transverse cut at each end of the main cut, and bending 100 outward the lips or edges 6 to form ribs or flanges, which serve the double purpose of stiffening or strengthening the eye swells and deflecting particles of dust, or small bits of metal or the like, striking the 105 shield.

By employing quite narrow slits of considerable length the vision is materially sharpened, and a wide range of view is assured, the slits permitting sufficient light 110

rays to enter and reach the eye to afford clear definition of objects, particularly of those at a distance from the observer, yet shutting out many rays from surrounding objects which tend to reduce the sharpness 5 or clearness of those objects to which the eyes are particularly directed. Further marked advantages in the employment of narrow slits instead of large openings are 10 that the danger of small missiles or particles of matter passing through the shield is greatly lessened, the shield is left stronger and stiffer, and in the event that glass or other transparent medium be used to fill the 15 slits, it may be more readily fitted in place, and the danger of breakage thereof and consequent injury to the eyes is lessened,—dangers which are present with the goggles and similar eye shields heretofore used.

When such transparent material is used it may be applied in any convenient way, as for instance by bending the metal along the longitudinal edges of the slit 5 to form grooves or channels 7, either on the outside
as shown in full lines or on the inside as shown by dotted lines in Fig. 11, or by employing a light clamping plate or frame 8 as shown in Fig. 12, to hold the transparent medium 9 between the shield proper
and itself. Any other usual method of securing the transparent body in place may of course be employed.

If made of sufficiently thin and malleable or ductile metal, the shield may be sprung 35 or bent sufficiently to fit it to the face of the person by whom it is to be used, but as it is contemplated to use in many instances a quite stiff and moderately heavy plate, I propose in some cases to make the 40 shield in two parts, and joint or articulate them at a point near the mid-length of the shield. Since, however, the upper portion of the shield which bears against the frontal bone, and the bridge or saddle por-45 tion thereof, are in different planes or at an angle one to the other, it is evident that a continuous hinge barrel reaching from the upper to the lower boundary of the shield cannot be used, or at least not without 50 difficulty. I therefore adopt one or another of the several equivalent constructions shown in Figs. 6 to 10 inclusive. Of these, Figs. 6 and 7 pertain to one and the same construction, the sections being taken on 55 different lines,-Fig. 6 through that portion which bears against the forehead, and Fig. 7 at a point below the sight slits 5. In Fig. 6 it will be seen that the plate

is divided into two parts which overlap at
or about the mid-length of the structure, the swell or bulge 3 being formed in both members, that of one member overlapping and fitting somewhat closely to that of the companion member. The same is true of
the saddle or bridge portion 2, as seen in

Fig. 7, which, however, is made to constitute somewhat more than a half cylinder, so that the inner circular portion shall fit closely within the outer or enveloping circular portion, and turn freely therein to a 70 limited extent, without danger of drawing apart. To prevent separation of the concentric barrels of the bridge when made in this form, one or more lips 10 may be formed at the lower edge of the outer barrel 75 and turned back under the lower edge of the inner barrel, as indicated in Figs. 6 and 7.

In Fig. 8 a pin and barrel hinge joint 11 is shown at one side of the nose bridge or saddle 2, the upper portion of the two sec- 80 tions of the shield being made to overlap in the same manner as indicated in Fig. 6. The relatively slight movement required about the hinge axis is practicable without any material disturbance of the proper re- 85 lation of the overlapping portions of the two sections above said hinge.

two sections above said hinge. Fig. 9 shows in horizontal section the bridge or saddle 2 divided at its mid-width, the line of separation being covered by a 90 thin and highly resilient plate 12, which may be soldered, brazed, or spot welded near its ends to the respective sections of the shield, thus permitting adequate flexure while leaving the metal of each section of 95 full strength and the joint closed.

Fig. 10 shows an analogous construction but with the connecting spring fastened in position by means of spurs or ears 13, passing through small openings in the shield 100 section, and bent down on the inside.

The inner or rear face of the shield or the boundaries thereof, may be faced with leather, felt, rubber, cork, or other more or less yielding substance, as shown at 14 in 105 Fig. 5, to form a cushion and insure a close and preferably air-tight contact with the face of the wearer.

To hold the shield in position for use, maintaining at all times a close contact with 110 the face of the wearer, yet avoiding harsh or severe pressure at any point, I provide the same with elastic temples or retaining devices, preferably in the form of a helical spring 15, with or without a shield or cover 115 16 of rubber or other suitable material. The cover is deemed advantageous in that it gives a softer or more yielding pressure where it bears against the face of the wearer, and also protects the wire against moisture and 120 consequent rust, and against becoming clogged with mud or dirt when the devices are used in trenches and like places. As the temples or holding bands are liable to be injured, it is desirable to make them 125 readily detachable. With this object in view a hook 17 preferably in the form of a snap-hook, is provided at one or both ends of the temple or holder, and the shield is provided at each end with an eye 18 to re- 130

ceive the hook. If both ends of the temple or holder be provided with snap-hooks they may be passed to the back of the head and the hooks there joined, but I contemplate in

- some instances providing one end of each temple with a wire or hook 19 (Fig. 1), adapted to fit around or back of the ear, after the manner of the so-called riding temple used with spectacles.
- Instead of using the helical form of 10 spring for the holding device, I may employ one of the form shown in Fig. 14, in which the bends or folds of the spring lie in common plane, thus producing a flat spring 20
- 15 which will lie closely against the temple of the wearer. This and other variations may of course be used without departing from the spirit or scope of my invention.
- The eyes 18 may be formed integral with 20 the shield as in Fig. 8, or as separate eyes 18ª riveted in perforations formed in said plate as in Fig. 1.

To the end that the wearer of such a shield may without removing it from his

- <sup>25</sup> eyes, readily look down to the ground at his feet, a small perforation 21 may be formed in the lower side of each eye swell or dome 4, as illustrated in Fig. 8. If the shield is to be used with or as part of a gas mask,
- 30 these perforations will be covered with some transparent material as in the case of the slits or sight openings 5; otherwise this will ordinarily be unnecessary
- When the user of the shield is wearing 35 the now well known metal helmet, the shield will be attached thereto by a device similar to that shown in Fig. 13, one of the snap hooks upon each spring holder en-
- gaging an eye or opening, as the case may 40 be, upon or formed in the helmet. Such arrangement allows the shield to be thrown up on the helmet or drawn down beneath the chin of the wearer.
- It is to be noted that the shield is 45 throughout formed with easy curves or without sharp or decided angles, thus greatly aiding in the deflection of missiles coming from any direction. Such form also tends to brace and stiffen the shield
- <sup>50</sup> quite effectively, and thus to enable it better to withstand impact without being broken or distorted.

Having thus described my invention, what I claim is:

- 55 1. A metallic eye-shield comprising a plate fashioned to bear flatwise against the forehead and cheeks of the wearer, and provided with a bridge to rest upon the nose and with bulging eye-covering portions at
- 60 opposite sides of said bridge, said eye-covering portions being provided with narrow slits having transparent closures. 2. An eye-shield comprising a metal plate

fashioned to rest flatwise against the fore-65 head and cheeks of the wearer entirely about the eyes, and bowed at its midlength to form a bridge for the nose, said plate being provided on opposite sides of said bridge with narrow slits extending in a substantially horizontal direction.

3. An eye-shield comprising a metallic plate fashioned to fit flatwise against the forehead and cheeks of the wearer, having at its midlength an arching portion to bridge the nose, and on opposite sides of 75 said bridging portion, dome-like elevations integral with the plate, and provided with narrow substantially horizontal slits, the edges of which are turned sharply outward, substantially as set forth. 80

4. An eye-shield comprising a plate to rest against the forehead and cheeks of the wearer, said plate having a nose bridge to rest directly upon the nose; an outward bulge or protuberance immediately above 85 said bridge; and eye-covering domes at opposite sides of the bridge, provided with narrow slits or sight openings.

5. An eye-shield of the character described, formed of two metallic plates fash- 90 ioned to rest flatwise against the face of the wearer, meeting near the midlength of the structure and flexibly united one to the other, whereby the plates are enabled better to adapt themselves to the face of the 95 wearer, each of said plates fashioned to form a dome-like bulge or enlargement, and each of said domes being provided with a narrow slit extending horizontally or in the direction of the major axis of the dome. 100

6. An eye-shield comprising a two-part plate having a saddle or nose bridge and eye swells provided with slits, said shield sections being united by a hinge at one side of the saddle or nose bridge, and having the 105 portions above said bridge arranged to overlap

7. An eye-shield comprising two sections overlapping in their upper portion and each there provided with a swell or bulge; a 110 saddle or nose bridge below said bulge; and a flexing connection between the two sections, with the line of flexure extending parallel with the nose bridge.

8. An eye shield comprising a plate 115 adapted to conform to the face of the wearer, having at its mid-length a saddle or nose bridge and at either side thereof an eye swell provided with a narrow slit, and having in the lower part of each eye swell 120 a small perforation to permit the eyes to look downward through the shield.

9. In combination with an eye-shield of the character described, a holding device comprising a metallic spring provided at 125 one end with a hook to engage an eye of the shield and at the opposite end with an ear-engaging loop.

10. In combination with an eye-shield of the character described, a holding device 130

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comprising an extensible metallic spring, and a non-metallic elastic covering therefor.

11. An eye-shield comprising a metallic 5 plate fashioned to fit flatwise against the forehead and cheeks of the wearer, said plate being provided at its midlength with an arching bridge for the nose and with dome-like swells or enlargements at oppo-

site sides of the bridge, each provided with 10 a narrow slit or opening; and a yielding lining applied to the inner face of the plate at its boundaries and serving as a cushion and as a means of effecting perfect contact with the face of the wearer. 15

In testimony whereof I have signed my name to this specification.

WILLIAM H. WILMER.

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