May 20, 1930. R. MALCOM 1,759,317

SHIELD

Filed July 9, 1928

Fig. 1.

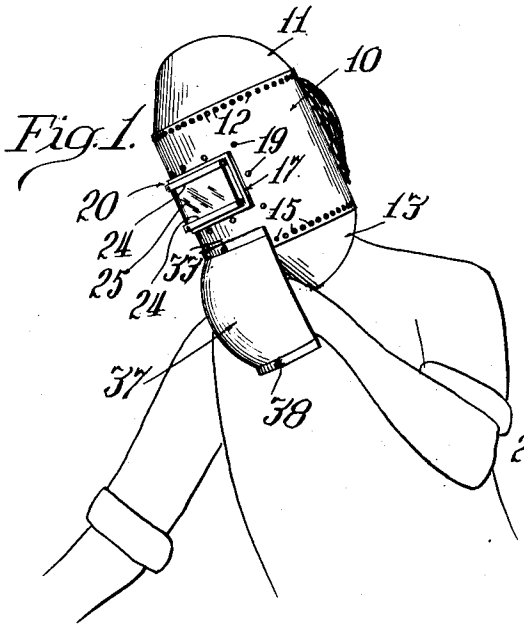


Fig. 2.

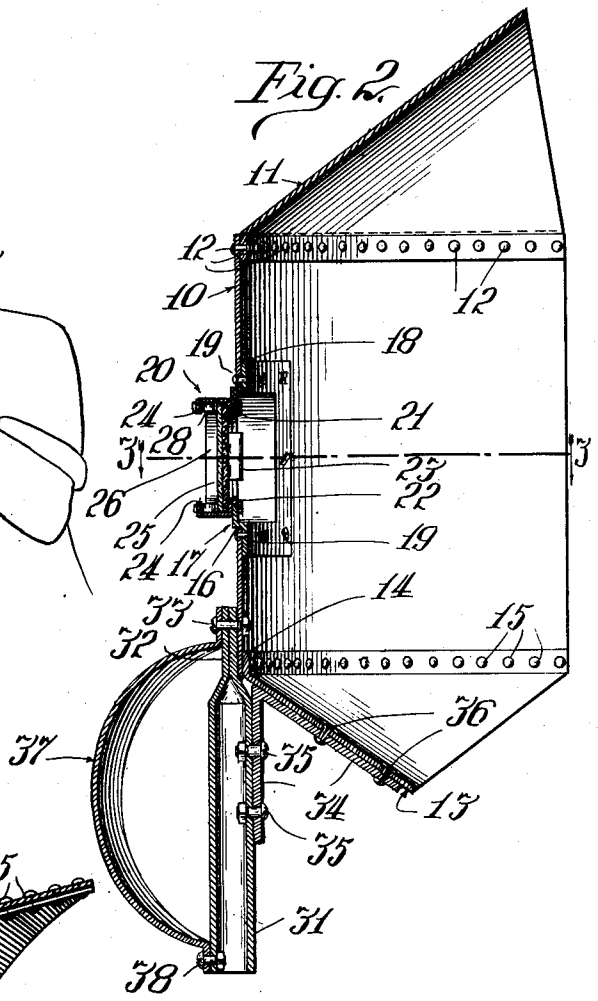
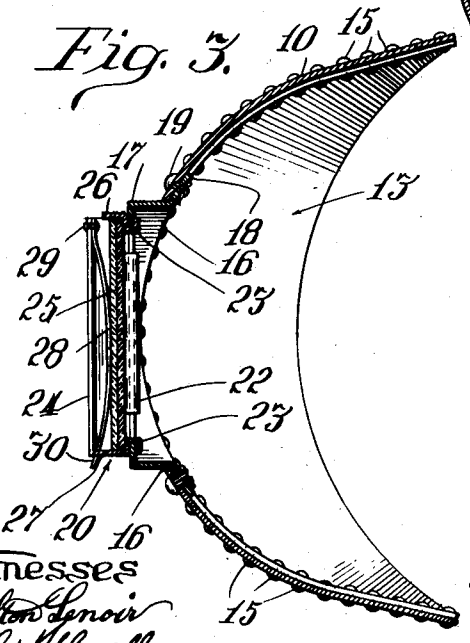


Fig. 3.



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UNITED STATES PATENT OFFICE

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SHIELD

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My invention relates to a protective shield or hand mask adapted for the protection of the face and head of the user, such as a welding operator, as well as for proper protection of the eyes of the user.

The invention has for its object the provision of a shield, which is comparatively light in weight while at the same time providing the necessary protection against the injurious light-rays; wherein the lenses at the sight-opening are securely and at the same time removably held in place by means which permit easy replacement of the lenses or glass to be made.

Another object of my invention is to provide a shield of such general construction, so far as the main portion thereof is concerned, that it may be readily converted into a hood type of shield by simply attaching suitable head-gear or holding straps or bands thereto when desired, without alteration in the shield proper.

The objects and advantages of my invention will be readily comprehended from the detailed description of the accompanying drawing, wherein—

Figure I illustrates the figure of a man holding my improved shield in front of his face; the shield being somewhat in perspective.

Figure 2 is a vertical sectional view of the shield.

Figure 3 is a cross-sectional view taken substantially on the line 3—3 of Figure 2.

The shield is formed of any suitable heat resisting material, such as fiber board, and preferably consists of a sheet 10 bowed into the arcuate form shown in Figures 1 and 3 so as to surround and cover the face and sides of the head of the user, see Figure 1. This main body portion 10 is provided with a top portion 11 also composed of suitable heat resisting material, such as fiber board, cut to proper shape to permit the marginal edge thereof to be bent and arranged in lapping relation with the top of the main body portion 10 to which it is properly secured, as for example by means of small fastening elements or rivets indicated at 12.

The top portion 11 is preferably arranged at an upward inclination as shown in Figures 1 and 2 to extend somewhat above the head of the user.

The lower end of the body portion 10 is provided with a bottom portion 13 which may be practically similar to the top piece 11, being also composed of suitable heat resisting material such as fiber board, with one of its marginal edges bent as shown at 14, to lap the lower marginal edge of the body portion 10, to which it is suitably secured by means of rivets as at 15. With the top and bottom portions 11 and 13 secured to the body portion 10 as shown and described, the shield will maintain the desired arcuate formation shown.

The body portion 10, at the forward part thereof, is cut away to provide a sight opening 16 which is adapted to receive a suitable metallic frame 17, preferably of the rectangular formation shown. The frame 17 is disposed about and through the sight-opening in the body portion 10 and has its inner side provided with a marginal flange 18 bent to conform with the arcuate formation of the body portion 10. This flange 18 has suitable fastening elements or rivets as at 19 in Figures 1 and 3 whereby the frame 17 is properly secured in place.

The frame 17 is formed to provide a suitable elongated or rectangular sight-opening and has its outer face provided with a lens-holding slide-way or frame 20 which is also preferably made of suitable metal. The frame 20 is preferably made separate from frame 17 for easy manufacture, but it is apparent that the frame 20 may be integral with frame 17 if desired.

In the particular exemplification of the invention, the lens-holding frame 20 consists of a separate piece of sheet metal cut out centrally to form a sight-opening co-extensive with the sight-opening in the main frame 17 and preferably also rectangular in shape to receive the rectangular lenses or glasses which are to be inserted therein. The lens-holding slide-way or frame 20 consists of a blank of sheet metal stamped into form to provide on its inner face at top and bottom and at its ends or sides the flanges 21, 22 and 23 which

are disposed through the sight-opening of the main frame 17 and are bent into clamping relation with the marginal edges of the sight-opening in the main frame 17, thereby securing the lens-holding frame in place.

The lens-holding frame 20 is preferably provided on its outer face at top and bottom with the outwardly and thence vertically disposed flanges 24, 24, see Figure 2, to provide means for holding the glass or lenses, indicated at 25, in place against shifting in a vertical direction.

The two sides or ends of the lens-holding frame 20 have the right angularly bent flanges 26, 27. The flange 27 is preferably of substantially the same transverse dimensions as the top and bottom flanges; while the flange 26 is preferably of transverse dimensions somewhat less than flanges 24 and 27 and therefore terminates somewhat short of the vertical portions of top and bottom flanges 24, 24, so as to leave a lens inserting opening therebetween. These top and bottom flanges 24, 24 are each provided with a spring member preferably in the form of a bowed spring strip 28. This is arranged horizontally lengthwise of the lens-holding frame on the inner faces of the vertical portions of the flanges 24, 24. One end of each spring member 28 is shown riveted to the vertical portion of each flange 24, as shown at 29; with the intermediate bowed portion of each spring in pressing relation with the outer lens or glass; while the opposite or free end of each spring is shown seated in a small socket formed at top and bottom in the larger side flange 27 adjacent to the vertically disposed portions of the top and bottom flanges 24, 24, as shown at 30 in Figure 3.

The spring members 28 are arranged above and below the sight-opening in the main frame 17 so as not to interfere with the proper vision of the user. The free ends of the spring members 28 are held in the sockets in flange 27 by the vertical portions of the flanges 24; and as the springs are disposed lengthwise of the lens-holding pocket or slideway, it is apparent that the glass or lenses may be easily slid into place from the end of the frame provided with the narrow flange 26. When it is desired to remove the lenses or glass, a slight outward pressure thereon will cause the spring members 28 to flex sufficiently to permit the end of the glass to move outwardly beyond the narrow flange 26 and allow the glass to slide endwise out of frame 20 through the space between flange 26 and the vertical portions of top and bottom flanges 24.

In devices of this character, it is usual to have the sight-opening provided with a sensitive glass adapted to eliminate the dangerous light rays such as the ultra violet ray.

In practice, the sensitive glass, either on the outside or both inner and outer sides, is provided with a white or clear cover glass for protection of the sensitive glass. In the exemplification of the invention, I have merely illustrated two glasses at 25; the inner one being the sensitive glass, while the outer is the white or cover glass.

With my arrangement, the lenses may be easily replaced and can be quickly inserted into the frame through one end of the slideways; the glass being normally held against the body of frame 20 and slightly beneath the edge of the narrow flange 26 so that accidental shifting of the glass is impossible; the spring members 28, 28 causing the glass to be held in flush relation with each other and against the main wall of the lens-holding frame 20 across the sight-opening therein.

The shield is provided with a hand grasp or handle 31 which is of heat resisting material, such as fiber board, preferably bent into tubular form with the upper end flattened out at 32 in order to permit it to be riveted or otherwise secured, if desired, as at 33, adjacent to the lapping edges of the main body portion 10 and bottom portion 13.

The handle or grasp 31 is mainly secured in place by the metallic strap or bracket 34 bent into the acute angular formation shown in Figure 2, with one leg of the bracket 34 fastened to the handle 31, as for example by rivets or screw-bolts 35; while the other leg of the bracket extends flush with the downwardly sloping portion of the bottom 13, to which it is riveted or otherwise secured as at 36.

As is apparent, the handle is mainly secured to the bottom wall 13 of the shield and the rivet or bolt 33, which provides greater rigidity for the handle, may be eliminated if desired.

In order to protect the hand of the user against the dangerous rays, the handle 31 is provided with a suitable guard or shield 37, preferably composed of fiber board, or other suitable heat resisting material, which may be readily bowed into the arcuate formation both laterally and longitudinally so as to more or less completely surround the hand of the user; with the upper and lower ends of the hand guard or shield 37 properly secured to the handle 31 in any suitable manner, while the sides are unattached as shown to permit the user to readily insert his hand between the handle 31 and the shield or guard 37, without interference. The upper end of the guard or hand shield may be secured in place by the rivet or bolt 33, while the lower end may be fastened by small rivets or bolts as at 38; it being understood that any suitable manner of fastening the guard 37 to the handle 31 may be employed.

The invention disclosed in the drawing has been described in terms employed merely as terms of description and not as terms of limitation, as modifications in certain respects

may be made without, however, departing from the spirit of my invention.

What I claim is:—

1. A shield of the character described comprising a body portion provided with rearwardly sloping top and bottom portions, the body portion having a sight-opening provided with a glass holding frame secured about said opening, a bracket disposed lengthwise of and secured to the bottom portion and having a vertically disposed leg substantially in the plane of the forward face of said body portion, a handle secured to said leg of the bracket, and an arcuate hand shield secured at top and bottom to said handle.

2. A shield of the character described comprising a body portion provided with rearwardly and oppositely sloping top and bottom portions, the body portion being provided with a sight-opening, glass-holding means in said opening, an angular bracket secured to said sloping bottom portion, a handle secured to the vertical leg of said bracket, and a curved guard secured to the handle so as to surround the hand of the user.

3. A shield of the character described comprising a body portion provided with a sight-opening, a sheet metal frame disposed through said opening, the inner side of the frame having an outwardly flaring flange adapted to extend parallel with and be riveted to the inner face of the body portion and having an inwardly disposed flange on its outer face; a glass-holding metallic frame having an outwardly opening groove about its inner face adapted to receive the inwardly disposed flange on the outer face of the first mentioned frame, the top and bottom walls of said glass-holding frame having vertically extending flanges disposed toward each other to provide a glass slideway, one of the side walls extending laterally throughout the width of the top and bottom walls so as to provide a closed end to the glass slideway, said wall at top and bottom having sockets, while the other side wall is of lesser width so as to permit insertion of the glass at the end of the frame; and bowed spring members arranged lengthwise of the top and of the bottom portion of the slideway, with one end of each spring immovably secured in place at the open end of the slideway while the free ends of the springs extend through said sockets at the top and bottom of the closed end of the slideway.

ROBERT MALCOM.