Sept. 11, 1945. J. O'REILLY 2,384,765

WELDER'S HELMET

Filed June 19, 1943 2 Sheets-Sheet 1

Fig. 1

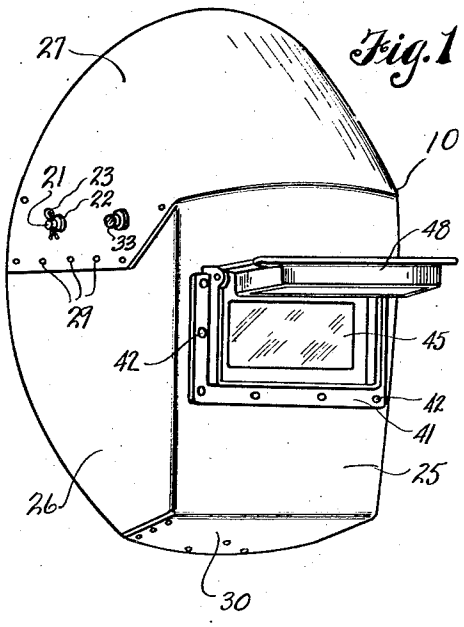


Fig. 2

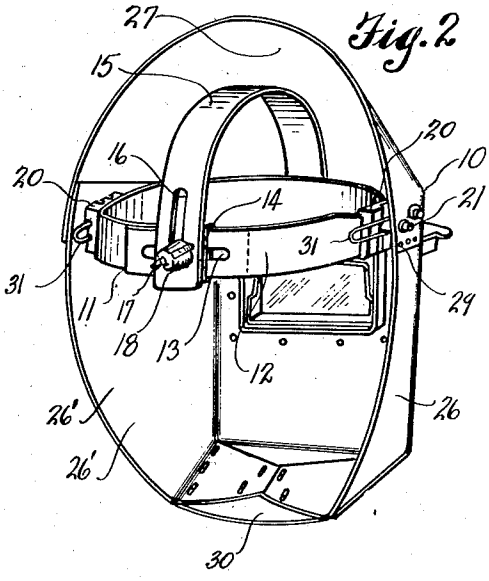


Fig. 3

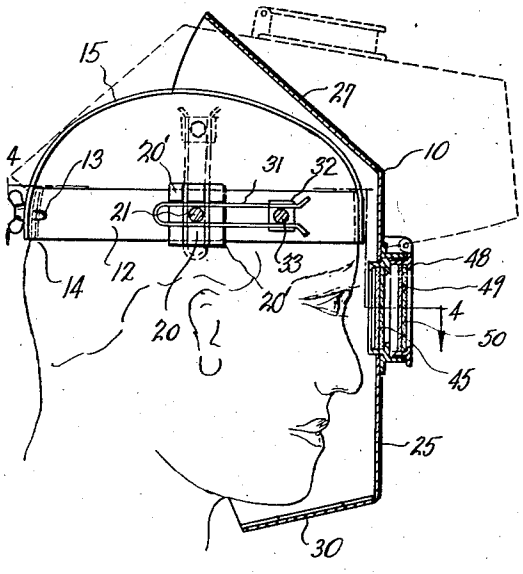
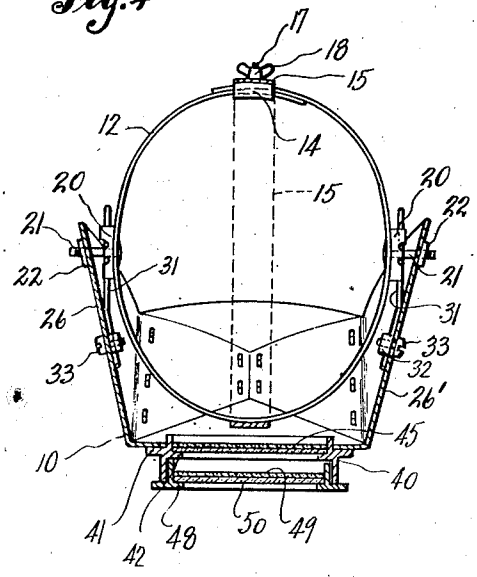


Fig. 4



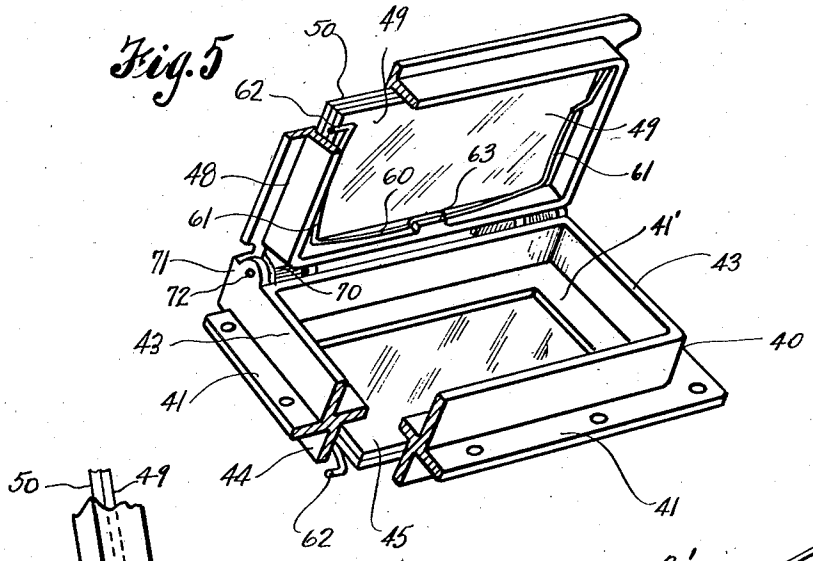
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Fig. 5



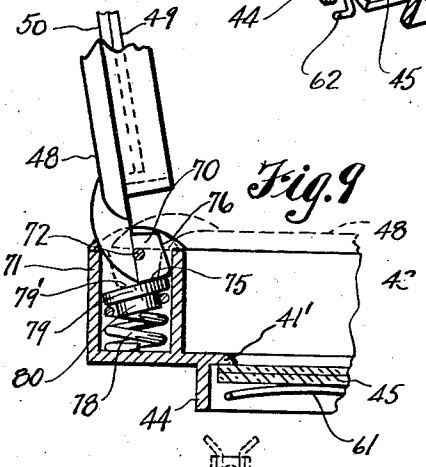


Fig. 9

Fig. 6

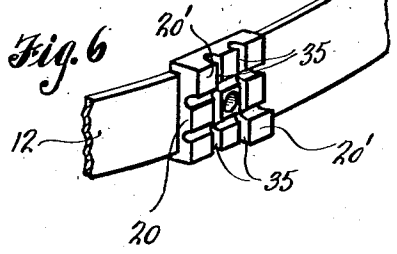


Fig. 7

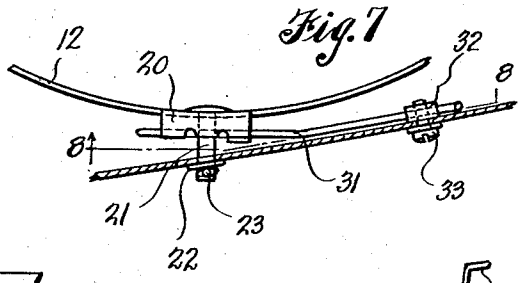
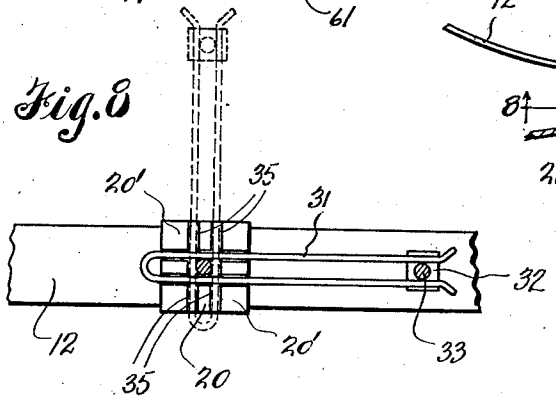


Fig. 8



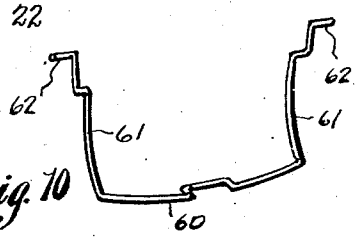


Fig. 10

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UNITED STATES PATENT OFFICE

2,384,765

WELDER'S HELMET

Joe O'Reilly, Tacoma, Wash.

Application June 19, 1943, Serial No. 491,452

2 Claims. (Cl. 2—8)

This invention relates to welder's helmets or masks, and devices of a like character, comprising a head band and a mask body that is supported therefrom for pivoted movement between a lowered, face protecting position, and a lifted position at which it is disposed out of line of vision of the user; the invention having for its principal object, to provide an improved and simplified means whereby the mask body may be yieldingly held either at its lowered, face protecting position, or at the lifted position. Another object is to provide various improved features in the general construction of parts that will simplify and lessen the cost of production of such devices.

Other objects of the invention reside in details of construction of parts, and in their combination and mode of use as will hereinafter be fully described.

In accomplishing the above mentioned and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a perspective view of the present helmet or mask as seen from the front, with the filter glass frame in its raised position.

Fig. 2 is a perspective view of the mask looking toward the inside thereof.

Fig. 3 is a central, vertical section through the mask, illustrating the head band and the mode of application of the device to the user's head.

Fig. 4 is a horizontal section taken on the line 4—4 in Fig. 3, illustrating the mask mounting pivots and the holding means.

Fig. 5 is a perspective view of the window frame and filter glass mounting frame, parts of which are broken away for purpose of better illustration.

Fig. 6 is a perspective view showing a stop block of the yieldable holding clip as applied to the head band.

Fig. 7 is a fragmental detail, illustrating the mounting of the holding clip on the head band and its relationship to the pivot trunnion and block.

Fig. 8 is a sectional view on the line 8—8 in Fig. 7.

Fig. 9 is an enlarged sectional detail of one of the mounting hinges of the "flip front" frame.

Fig. 10 is a perspective view of one of the plate holding spring clips.

Referring more in detail to the drawings—

Devices of this kind are usually worn by welders to protect their faces against heat and flying metal sparks, and to protect the eyes against the glare of the welding flame, and it is advantageous that the mask body be supported from the head of the user in such manner that he may, without undue effort, or waste of time, tilt the mask upwardly out of his line of vision when not needed and to give better view of the work at hand, and may later be quickly moved back to its protective position.

In its present preferred form of construction, the device comprises a mask body which is designated in its entirety by reference numeral 10, and a head harness which is designated in its entirety by reference character 11. The head harness, as seen best in Figs. 2, 3 and 4, comprises a band 12 that is shaped to encircle the head of the user of the mask. This, preferably, is a continuous strip of flexible material, which may be fiber, metal or the like, and which has its opposite end portions longitudinally slotted as at 13 in Fig. 2, and overlapped at the back of the head engaging portion. These slotted end portions of the band extend slidably through a sleeve 14 which holds them in assembled relationship. Another strip 15 is arched to cross over the top of the head and this is attached at one end to the band 12 centrally at the front, and has its other end longitudinally slotted, as at 16, and this overlaps the sleeve 14, as in Figs. 2 and 3. The slots in the bands 12 and 15 permit adjustment of the harness to fit the head of the user of the mask, and to hold the adjustment, a clamp bolt 17 is applied through the sleeve and through the slots, and this bolt has a wing nut 18 applied thereto which may be tightened to clamp the parts at any set position.

Fixed to the band 12 at opposite sides, and against the outside surfaces of the band, are latch blocks 20—20, presently described in detail, and also fixed in the band and extended outwardly therefrom and centrally through the blocks 20 are pivot trunnions 21—21 on which the opposite side wall portions of the mask body are mounted; these walls being held against displacement from the trunnions by means of washers 22 held on their outer ends by cotter keys 23, or the like, applied through their outer end portions, as shown best in Figs. 1 and 7.

The mask body is made of a light, durable and fire resisting material such as fiber or sheet metal. As best shown in Figs. 1 and 3, it comprises a substantially flat front wall 25 from which opposite side portions 26 and 26' are turned back in divergence, as noted in Fig. 3. Also, there is a top portion 27, which is rearwardly and

upwardly inclined from the top edge of the front wall. The opposite side flanges of this top section are overlapped with and are attached to corresponding side portions, by rivets, or the like, as indicated at 29 in Fig. 1. Also, there is a bottom wall portion 30 that is turned back from the bottom edge of the front wall to underlie the chin of the user, as shown in Fig. 3.

It is preferred that the mask body be made from one piece of material, and that this be creased, cut and edges overlapped to provide the shape here shown, and that the overlapped portions at the bottom be riveted, or that they be otherwise secured together to hold the body in this shape.

It is an advantage in this particular construction to provide the overlapping of those edges which are secured by the rivets 29 as this gives added strength and rigidity at the sides where the pivot mountings are received and where the spring clips are attached.

The trunnions 21—21 which extend from the head band 12, at opposite sides of the harness, extend pivotally through the rear edge portions of the side walls 26—26' of the mask, and permit the mask to be swung upwardly thereon from the full line position in which it is shown in Fig. 3, to the dotted line position. In the full line position, the mask protects the face of the user of the mask while in its raised position, it overlies his head and is out of his line of vision.

In the use of such a device, it is quite advantageous that it be not required to remove the mask from the head, but that a clear view of the work be provided merely by tilting the mask to the raised position, where it will be yieldingly held during inspection of work, and then to bring it down to a lowered, protective position as soon as the welding torch is brought into use. It is required, however, that some means be provided to retain the mask at a set position. Also, in the lowered position of the mask, it is naturally required that provision be made for not obstructing view of the work. Therefore, a window is placed in the front wall 25 in alinement with the user's eyes, as will be understood by reference to Fig. 3.

First, describing the means herein provided for yieldingly holding the mask in either of its positions of adjustment: This comprises spring wire latch arms 31—31 located at opposite sides of the head band and within the side walls of the mask. Each arm is made of a single piece of spring wire, bent into an elongated U-shape, as illustrated best in Figs. 7 and 8. The ends of the piece of wire forming each arm are fixedly applied to a small block 32 which is secured by a screw bolt 33 to the corresponding side wall of the mask. The parallel leg portions of the arm, at each side of the mask, receive the corresponding pivot trunnion 21 between them, and the looped end portion of the arm is pressed tightly against the outer face of the latch block 20 through which the trunnion extends.

Each block 20 is provided in its outer face with two sets of parallel grooves 35, and these are formed in the block in right angular relationship to each other. Furthermore, the latch arms are so secured to the mask walls, and are bent in such manner that each will be held under tension, pressing against the grooved faces of the blocks, to cause the legs of the arms to be seated in one or the other set of the parallel grooves when the mask is brought into raised or to lowered position, thus to yieldingly hold it in that position.

In Fig. 3, the spring arm is shown in full lines in that position at which the mask is held yieldingly in face protecting position, and in dotted lines, it is shown in the position it assumes when the mask is raised. In both of these positions, the legs of the spring arm are seated in a set of grooves, and held with such tension that the mask will be retained yieldingly against movement. However, this holding tension may be overcome by lifting or lowering pull applied on the mask body.

A feature of this latch block arrangement and construction, is illustrated in Fig. 6, wherein it is shown that two diagonally opposite corner sections of each block 20, designated by reference numerals 20' and 20', are somewhat extended beyond the outer surfaces of the other portions of the block so that they will operate as stops that will engage against the arms in a manner whereby to limit the pivotal movement of the mask in its opposite directions. The grooves in these blocks are not of such depth that the legs of the arms can be solidly seated therein, but only to receive them to a limited depth.

The window which is applied to an opening in the front of the mask comprises a rectangular frame 40, preferably of plastic, having extending flanges 41 designed to engage flatly against the front wall about the opening therein, and to receive attaching rivets or bolts 42 therethrough, as noted in Fig. 1. The frame 40 also comprises flanges 43 and 44 that project outwardly and inwardly with respect to flange 41. The flange 44 extends through the wall opening, as seen in Figs. 3 and 4, and fitted within flange 44 and against a bottom flange 41', is a plain glass panel 45 of one or more layers. Hinged to the frame flange 43 to swing outwardly and upwardly therefrom, is another window of the "flip front" type comprising a frame 48 in which a filter glass panel 49 is mounted. The hinge connection is best illustrated in Fig. 9 and will later be described in detail. The panel 49 is of dark glass or what may be termed ray filter glass, designed to protect the user's eyes from the glare of the welding torch, and overlying this, is placed a panel of transparent glass 50 merely to protect the more expensive ray filter panel.

In order to hold the glass panels 45 and 49 in place in their respective frames, I have provided each frame with a spring wire holding clip. Each clip, as noted in Figs. 5 and 10, comprises a cross portion 60, from which extend opposite side or leg portions 61—61, bent at a right angle to the cross portion and formed with out-turned ends 62—62, serving as mounting trunnions or pivots. These pivots for the clip in the frame 40 are seated in holes in opposite side flanges 44 of the frame. Likewise, the leg portions of the clip that is applied to the hinged frame 48, are applied to holes in the opposite sides of that frame. The cross portion 60 of each clip is outwardly bowed, as will be observed in Fig. 5. Likewise, the legs 61—61 are bowed, but inwardly so as to engage with the edge portions of the glass panel, and there is a lug 63 projecting from the frame, back of which the cross piece 60 may be engaged to hold the clip in place. When so held, the inwardly bowed legs 61—61 will be pressed tightly against the ends of the glass panel to hold it in place. When it is desired to remove the panel, it is only necessary to lift and disengage the cross piece 60 from the lug 63, then to swing the wire clip outwardly on its pivots, leaving the panel free for displacement from the

frame; it being observed in Fig. 5 that the pivots enter the frame close to the longitudinal edge that is opposite that adjacent which the lug 63 is located. The glass panel is of such dimensions that when the clip is released, it can be easily dispaced from within the frame.

To hingedly mount the flip front frame 48 on the frame 40, it is equipped at one of its longitudinal edges, and adjacent the ends of the frame, with projecting lugs 70, each of which is located within the open outer end portion of a spring retainer housing 71 that is formed as a part of the frame 40 which is fixed to the mask. As seen in Fig. 9, each lug 70 has a pivot or hinge pin 72 extended therethrough, and through the side walls of the housing, whereby to hingedly mount the flip frame 48 in such manner that it can be closed over or lifted from the frame 40. In Fig. 1, the frame 48 is shown in its raised position so that the mask user can see through the clear glass panel 45. In Fig. 3 the flip frame is shown closed over the frame 49 so that the user's eyes are then protected against glare by the panel 49.

Each lug 70 has two flat surfaces 75 and 76 in planes at nearly a 90° angle to each other, and within each housing is seated a coiled spring 78 which at one end mounts the plug 79 thereon. Each block has a flat top surface 79' and is formed with a stem portion 80 which extends into the mounting spring to hold the parts in proper position. The block substantially fits the housing, and thereby there is no tendency of the spring to upset.

As will be observed in Fig. 9, when the flip front is raised, the spring presses the block tightly against the flat surface 75 and thereby yieldingly retains the flip front in raised position. When the flip front is pushed toward closed position, the lug pivots on its mounting pin, compresses the spring and finally the block is permitted to engage flatly with the surface 76 of the lug, thereby to yieldingly hold the flip front in its closed position, as indicated in dotted lines in Fig. 9. The construction is such that whenever the point of the lug passes over a dead center position in swinging the flip front from one position to another, then the spring acts to snap the frame 40 to the position toward which it is being moved.

It is anticipated that a lubricant will be placed on the surface of the block so that the action of the flip front will be easy.

Assuming the parts of the present device are so constructed and have been assembled as described, there will be produced a device that has embodied all of the important features which welders or users of such equipment consider essential or desirable. First, such a device, when made of fiber, is heat resistant, and durable, yet light in weight, and because of its lightness, can be worn without causing any discomfort to the user. The adjustability of the head band permits the mask to be worn to the best advantage of the individual using it. The novel form of spring holding clip permits easy adjustment of the mask between its raised and lowered positions, merely by lifting or lowering pressure thereagainst, and when in its raised position, there is a balance due to the central location of the pivot, that is very advantageous.

The provision of the flip front window permits clear vision when such is desired without lifting the mask, and provides for the quick and convenient closing of the ray filter window during the welding operation for the protection of the user's eyes. The novel clips for holding the glass panels in place permits easy and quick removal and replacement of the panels, when such is required.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is:

1. In a welder's mask of the character described, a head band, a block fixed to the head band at a side thereof, having a substantially flat outer face, a pivot stud extending from the block at a central location of the said face, two pairs of grooves formed across the face of the block substantially in right angular relationship to each other and with paired grooves passing on opposite sides of the pivot stud, a face shield having a side wall pivotally receiving the stud therethrough for raising and lowering movement of the shield, and a spring clip comprising a single piece of spring wire bent in an elongated U-form with the ends of the wire fixed rigidly to the side wall of the shield and with the looped end portion of the clip receiving the stud therethrough, and with the two legs of the loop yieldingly engaging against the grooved face of the block and adapted to seat in paired grooves to determine the raised and lowered positions of the shield and to yieldingly retain it at either of said positions.

2. A construction as recited in claim 1 wherein the block is formed with raised portions forming shoulders against which the looped portion of the clip may engage to definitely limit the movement of the shield when moved to raised or lowered positions.

JOE O'REILLY.