June 18, 1946. J. L. MOROW 2,402,431

WELDER'S HEADGEAR

Filed June 9, 1944

Fig. 1.

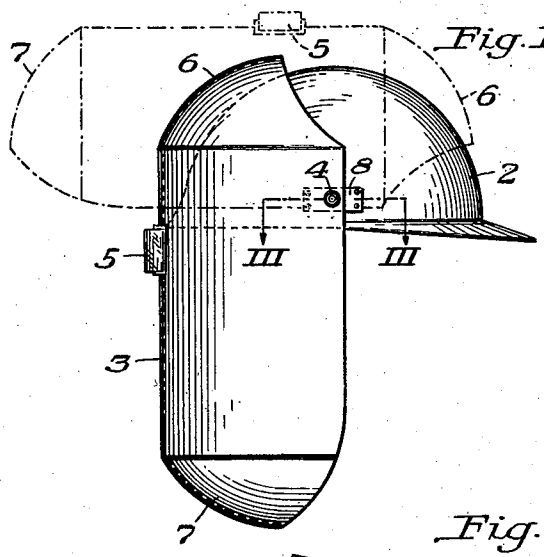


Fig. 2.

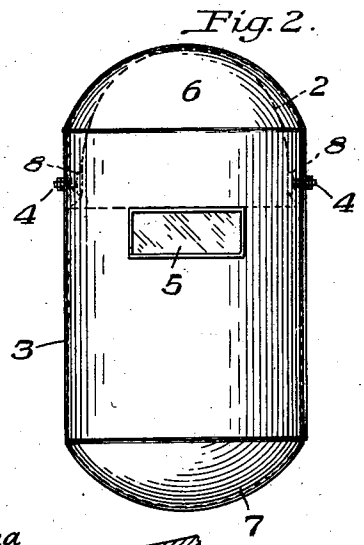


Fig. 3.

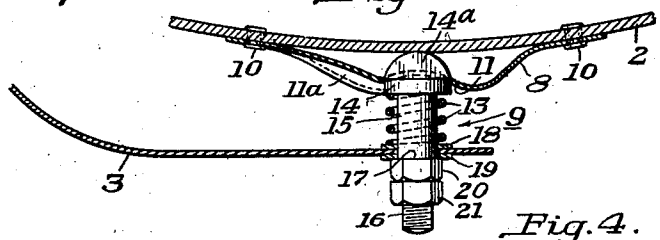


Fig. 4.

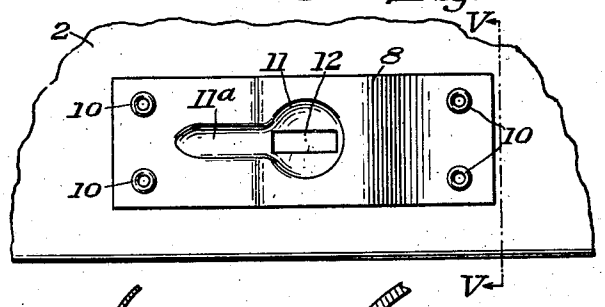


Fig. 6.

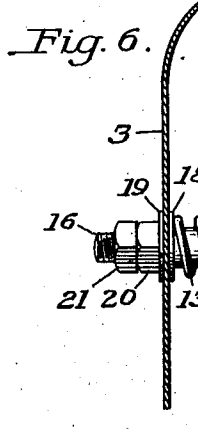
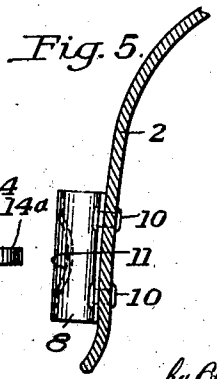


Fig. 5.



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WELDER'S HEADGEAR

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14 Claims. (Cl. 2—8)

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The invention relates to welder's headgear which are formed of a safety helmet for the head and a vizor for the face of the user. The invention consists in certain new and useful improvements in means for pivotally and detachably securing the vizor to the helmet.

The art is familiar with safety headgear of the type to which this invention is directed. The safety helmet consists in a dome-shaped hat formed of sheet metal, canvas-base Bakelite, or vulcanized fibre, suitably shaped and lined with fabric straps, or the like, to fit the head of the wearer, and to provide protection against falling pieces of metal and such other dangers as may be encountered in the shipyard or industrial plant in which the wearer works. The vizor is attached to the helmet, to protect the eyes and face of the workman from the bright light, heat and flying bits of hot metal and oxide incident to metal-welding operations.

The vizor comprises an approximately semi-cylindrical shell of fibre pressed to shape in accordance with practice known to the art, but it will be understood that the vizor may be formed of other materials, such as sheet metal. The vizor is pivoted at its two edges to the opposite sides of the helmet, and is thus supported in position over the face of the welder. The wall of the vizor in front of the eyes of the welder is windowed, and in this window a transparency of heavy glass or plastic is secured. The transparency is colored or otherwise treated to filter out a substantial part of the brilliant and sharp light generated in the welding process, whereby the welder may have clear vision of the work without harm to his eyesight. As said, the vizor is pivoted to the helmet, and such pivotal union permits the vizor to be swung upward from the face of the worker, without removing the gear from position on his head. This ready movability of the vizor on the pivots is very desirable, if not essential, in that it allows the workman frequently to swing the vizor away from his face to rest his eyes and breathe the open air.

In order that the vizor may sustain itself in any of the angular positions into which it may be swung, the pivotal engagement between the vizor and the helmet is a relatively tight or frictional engagement, whereby, while the vizor may be readily adjusted in desired position, the friction of the pivotal joints is adequate to retain the vizor in the position into which it is swung. Additionally, it is desirable that the vizor may from time to time be entirely disengaged from the helmet, so that the workman, discontinuing

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his welding operations for a period, say during lunch hour in the plant, may remove the vizor while keeping the helmet in place to protect his head.

With these circumstances in mind, it will be understood that the invention hereof consists in improved means for pivotally securing a vizor to a helmet in the manner desired, while permitting the vizor to be detached from and attached to the helmet easily and quickly. The invention will be understood upon reference to the accompanying drawing, in which:

Figure 1 is a view in side elevation of a welder's headgear in which the invention is embodied, the vizor of the headgear being shown in normal service position in full lines and in elevated or "rest" position in broken lines;

Figure 2 is a view of the same in front elevation;

Figure 3 is a fragmentary sectional view of the assembled structure to larger scale, as seen on the plane III—III of Figure 1;

Figure 4 is a fragmentary view of the side of the helmet on the scale of Figure 3, showing a certain socket portion that forms an element of the means for providing articular union between the vizor and the helmet;

Figure 5 is a sectional view of the structure shown in Figure 4, the plane of section being indicated at V—V in the latter figure; and

Figure 6 is a sectional view of the vizor, showing one of the pivot devices thereof in side elevation, in position for assembly with the complementary socket portion carried by the helmet.

Referring to the drawing, the reference numeral 2 is applied to a safety helmet and 3 to a welding vizor, each being in this case of conventional construction. The vizor is pivoted at the points 4 to the helmet. When the helmet is in place on the head of the welder the vizor may be positioned (see the full-line position in Figure 1) to extend downward over the welder's face, and alternately may be swung upward into position (see the broken line position) away from the welder's face. The vizor includes the usual window 5 of heavy glass or other light-filtering transparent material, and the otherwise semi-cylindrical body of the vizor is provided with a segmental spherical portion 6 that overlies the helmet, and a similar portion 7 that in service position underlies and protects the chin of the welder.

The invention is centered in the means for pivotally uniting the vizor to the helmet at the points 4. The pivot means comprise two socket

portions or members 8 that are secured to, or embodied in, the opposite sides of the helmet, together with two pivot devices 9 that severally engage the sockets in an engagement preventative of pin rotation. The pivot devices on the opposite sides of the vizor extend in axial alignment, and, when they are engaged in said socket portions the vizor is rotatable on them. The engagement of the vizor with the pivot devices is a frictional engagement, and through the effect of the friction of such engagement the vizor is adapted to be sustained in the position into which it is swung. And the pivot devices are designed to permit the ready detachment of the vizor from the helmet.

While the socket members 8 may be integrally formed in the body of the helmet, in this case they are independently fashioned of sheet metal, and riveted to the body of the helmet, as at the four points 10. Impressed in the body of each member 8 is a tadpole-shaped recess 11. In the circular or semi-spherical portion of the recess (to which the numeral 11 is immediately applied) the sheet metal is punched out to form a slot 12, and this slot is aligned with the elongate groove-like portion 11a of the recess. The body of the sheet metal member is outwardly bulged, so that the slotted circular portion of the recess stands at an interval from the adjacent wall of the helmet, with the groove portion of the recess sloping (due to the form of the bulge) from the slotted recess portion downward or inward to substantial tangency with the surface of the helmet to which the member 8 is secured. The functions of the particular shape of the recess and of the slot will presently appear.

The pivot device 9 on each side of the vizor comprises a pin or bolt that is formed with a terminal portion or head 14, a cylindrical shank portion 15, and a threaded shank portion 16, the threaded shank portion being shown as formed to smaller diameter than the cylindrical portion, providing a shoulder 17 between the shank portions, although in some cases the bolt shank may be of uniform diameter throughout its length. The body of the vizor is provided with a hole adjacent to each of its side edges at the points 4 where pivotal attachment to the helmet is to be made, and in each of these holes a pivot pin is positioned, as shown in Figures 3 and 6, with washers 18 and 19 positioned on the opposite faces of the thin body of the vizor. A helical spring 13 is arranged on the cylindrical shank portion 15 of each pivot pin, and this spring is compressed between the head 14 of the pin and the washer 18 that bears against the surface of the vizor body, the spring being compressed, and held by screwing a nut 20 upon the threaded portion of the pin. The nut 20 is run against the washer 19 and tightened to provide the desired compression of the spring, and then a second nut 21 is screwed on, to lock the nut 20 in place. Under the stress of the compressed spring, the pivot pin is sustained in position with the nut 20 yieldingly pressed against the washer 19 on the outer surface of the vizor body, while the spring itself bears yieldingly against the washer 18 on the inner surface of the vizor body. Thus, the two washers are held in frictional engagement with the body of the vizor and the washer 19 in turn bears frictionally upon the nut 20 secured to the pivot pin, while the spring 13 exerts a yielding thrust between the head 14 on the pin and the washer 18. The magnitude of the friction thus provided in the pivotal attachment

of the pins to the vizor is such that, if the pins be supported and held against turning, the vizor will be self-sustaining in any position into which it is swung. The slotted recesses provided on the opposite sides of the helmet provide such a support for the pivot pins.

It will be noted that the heads of the pivot pins are adapted to seat endwise in the sockets. The heads of such pins are formed with semi-circular protuberances or lugs 14a which are adapted severally to engage the slots 12 of the socket members on the opposite sides of the helmet. When the heads of the pivot pins are seated in the circular recess portions 11 of the socket members, with the lugs 14a of the heads engaged in the slots, a secure attachment of the vizor to the helmet is afforded, and it is an attachment in which, obviously, the pivot pins are held against rotation. Accordingly, the vizor may be swung on the pins into various angular positions, and the frictional engagement between the vizor and the pins is effective to sustain the vizor in the position into which it is so adjusted.

In order to detach the vizor from the helmet the outer nut-carrying ends of the pivot pins, or the opposite side edges of the vizor, are grasped and the side edges of the vizor are pulled outward or spread, the body of the vizor having sufficient elasticity or flexibility to permit this. Such outward movement of the side edges of the vizor shifts the heads 14 of the pins out of the sockets or recesses 11 and disengages the lugs 14a from the slots 12. Then the vizor is moved forward—to the left in Figure 1—from the helmet, and the lugs 14a advance with guided movement along the sloped grooves 11a of the recesses until disengagement is complete. Indeed, the sides of the vizor may in some cases be spread wide enough to effect the entire disengagement of the pivoted connection of the vizor to the helmet, without requiring that the lugs 14a be slid along the grooves 11a. When it is desired to apply the vizor to the helmet, the vizor is placed so that the lugs 14a on the headed ends of the pivot pins are aligned with the grooves 11a, and the vizor is pressed towards the helmet. The lugs on the ends of the pins slide along the grooves 11a, and as they so slide the side edges of the vizor are temporarily spread (due to the sloping of the grooves, see Figure 3) under the stress transmitted through the pins 15, springs 13, and the washers 18 that bear against the inner surface of the vizor. As the vizor reaches ultimate position of assembly with respect to the helmet the headed ends of the pins, under the effect of the elasticity of the spread edges of the vizor, "snap" into position in the slotted recesses 11 and provide the articular union of the vizor to the helmet, as already described. The pivot devices 9 will be understood to comprise pivotal snap-fasteners that are adapted pivotally to engage the vizor to the helmet, or to disengage the vizor from the helmet, without the removal or disassembly of any of the elements of the devices 9.

The designer and mechanic will perceive that the socket portions or equivalent means may be included in or carried by the vizor and the pivot devices or equivalent means 14 may be carried by the helmet. These and other modifications and changes may be made in the structure, without departing from the principles of operation described, and it will be understood that such modifications and changes are held within the ambit of the appended claims.

I claim as my invention:

1. In a welder's headgear comprising a safety helmet and a welding vizor pivoted thereto, the improvements herein described in means for pivotally uniting the vizor to the helmet which comprise a socket portion on a side of the helmet, a pin pivoted to a side of said vizor and including a portion detachably seating endwise in said socket portion, and means cooperating with said pin to provide frictional articulation of the vizor to the helmet.

2. In a welder's headgear comprising a safety helmet and a welding vizor pivoted thereto, the improvements herein described in means for pivotally uniting the vizor to the helmet which comprise a socket portion on a side of the helmet, a pin pivoted to a side of said vizor and including a terminal portion detachably seating endwise in said socket portion, and a spring arranged on the pin between said terminal portion and the body of the vizor to provide frictional articulation of the vizor to the helmet.

3. In a welder's headgear comprising a safety helmet and a welding vizor pivoted thereto, the improvements herein described in means for pivotally uniting the vizor to the helmet which comprise a socket portion on each of the opposite sides of the helmet, pins pivoted to the opposite sides of the vizor, said pins severally including terminal portions adapted detachably to seat endwise in said socket portions to unite the vizor pivotally to the helmet, and means for providing friction in the pivotal union whereby the vizor is self-sustaining in various positions of angular adjustment on the helmet.

4. In a welder's headgear comprising a safety helmet and a welding vizor pivoted thereto, the improvements herein described in means for pivotally uniting the vizor to the helmet which comprise a socket portion on a side of the helmet, a pin pivoted to a side of said vizor and including a terminal portion shaped to seat in said socket portion in an engagement preventative of pin rotation, and a spring arranged on the pin between said terminal portion and the body of the vizor to provide frictional articulation of the vizor to the helmet.

5. In a welder's headgear comprising a safety helmet and a welding vizor pivoted thereto, the improvements herein described in means for pivotally uniting the vizor to the helmet which comprise a slotted socket on each of the opposite sides of the helmet, pins pivoted to the opposite sides of the vizor, said pins severally including terminal portions detachably engaged in said slotted sockets in an engagement preventative of pin rotation, and a spring arranged on each pin between its said terminal portion and the body of the vizor to provide frictional articulation of the vizor to the helmet, said pins being movable to disengage said terminal portions from the sockets and thereby detach the vizor from the helmet.

6. The structure of claim 5, each of said sockets including a sloped groove for guiding the associated pin into position of engagement with the socket, substantially as described.

7. In a welder's headgear comprising a safety helmet and a welding vizor pivoted thereto, the improvements herein described in means for pivotally uniting the vizor to the helmet which comprise a socket portion on each of the opposite sides of the helmet, means secured to each of the

opposite sides of said vizor for engaging said socket portions on the opposite sides of said helmet and pivotally securing the vizor to the helmet, said pivotal securing means being movable outward from said socket portions to permit detachment of the vizor from the helmet.

8. A welder's headgear comprising a welding vizor having a friction pivot at each side thereof, and a safety helmet having means at each side thereof in which the pivots are yieldingly seated and secured against rotation, said pivots being axially movable from seated position to permit detachment of the vizor from the helmet.

9. A welder's vizor comprising a vizor element, a pivot pin at each side of the vizor element about which the vizor may turn, each pivot pin having a flat sided head portion with a rounded end surface thereon at its inner end for engagement with a seat portion on a helmet.

10. A welder's helmet having vizor retaining means thereon at each side thereof, said vizor retaining means comprising an inclined cam surface, and means providing a non-circular pin socket at the high point of each cam surface.

11. Welder's headgear comprising a helmet having socket elements at each side thereof, a vizor, and snap-fastener means on the vizor at each side thereof yieldably engaged in the socket elements of the helmet for detachably securing the vizor to the helmet, said last named means comprising pivot pins about which the helmet may turn.

12. In a welder's headgear comprising a safety helmet and a welding vizor articulated thereto in a pivotal and frictional connection about which the vizor may be swung in an arc, the herein described invention in such connection which comprises a pivot device on each side of the vizor, and means on each side of the helmet to receive said pivot devices, said pivot devices being yieldingly engaged in said means but being movable on the axes of the pivot device outward from engagement with said means to permit the ready separation of the pivotal connection and the removal of the vizor from the helmet.

13. In a welder's headgear comprising a safety helmet and a welding vizor having a body formed of elastic material articulated thereto in a pivotal and frictional connection about which the vizor may be swung in an arc, the herein described invention in such connection which comprises a pivot device on each side of the elastic body of the vizor, and means on each side of the helmet to receive said pivot devices, said pivot devices, as carried by the sides of the elastic vizor body, being yieldingly engaged in said means, the sides of said vizor body on which said pivot devices are located being laterally flexible against the inherent resilience thereof, whereby such sides of the vizor body may be spread in effecting the separation of the pivotal connection to permit removal of the vizor from the helmet.

14. A welder's headgear comprising a helmet, a vizor, a pin element at each side of the vizor about which the vizor may rotate through an arc, means for frictionally restraining the pin and vizor against free rotation, a head on each pin, and a socket on the helmet at each side thereof in which the head of the pin on the corresponding side of the vizor is releasably and non-rotatably retained.

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