Aug. 10, 1943. F. H. MARKGRAF, JR., ET AL 2,326,376

WELDER'S HOOD

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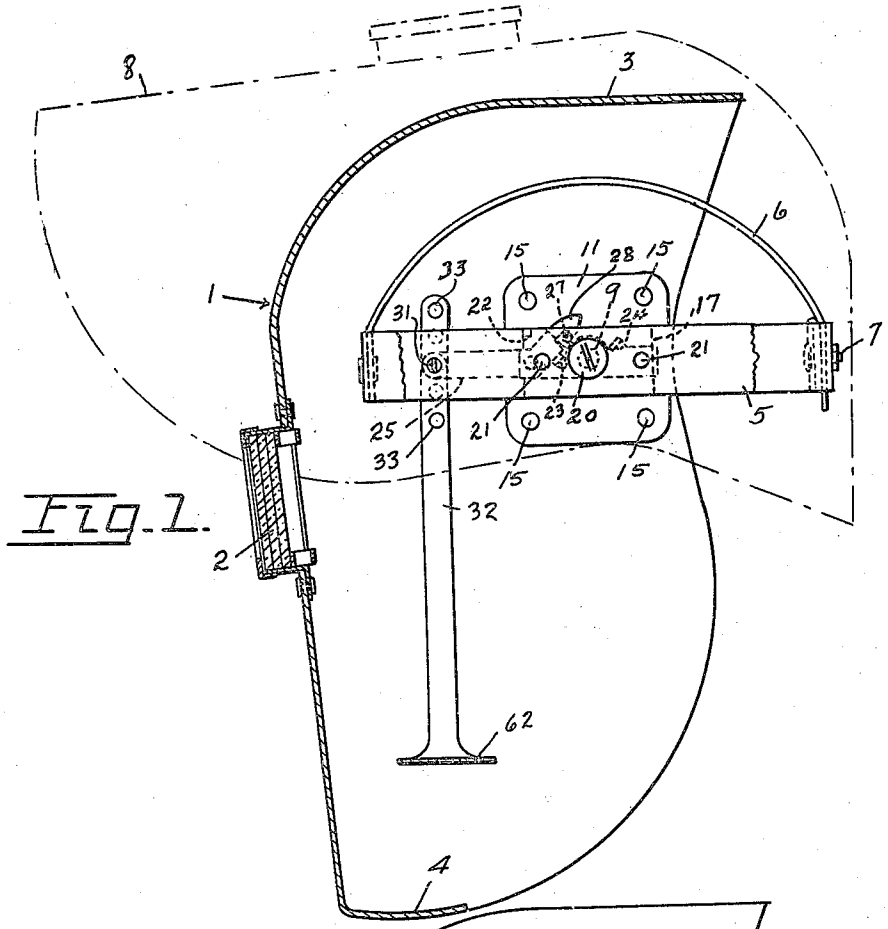


Fig. 1.

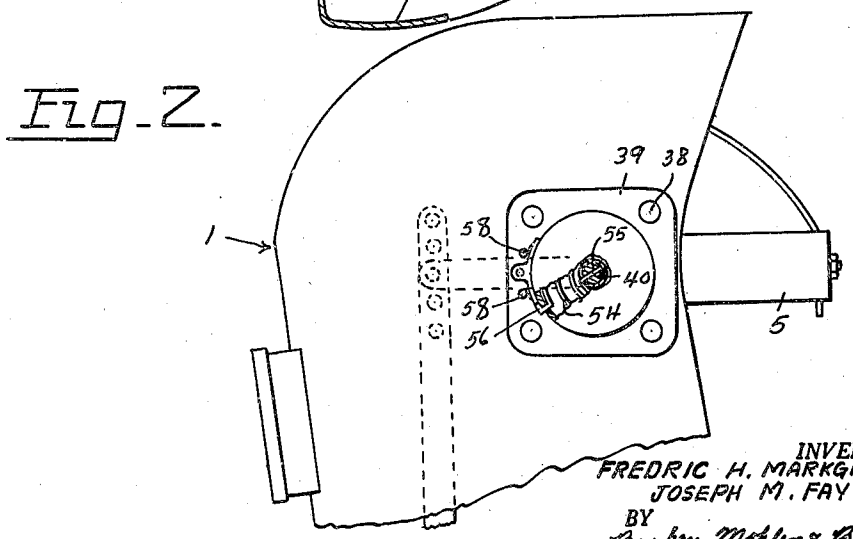


Fig. 2.

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Fig. 3.

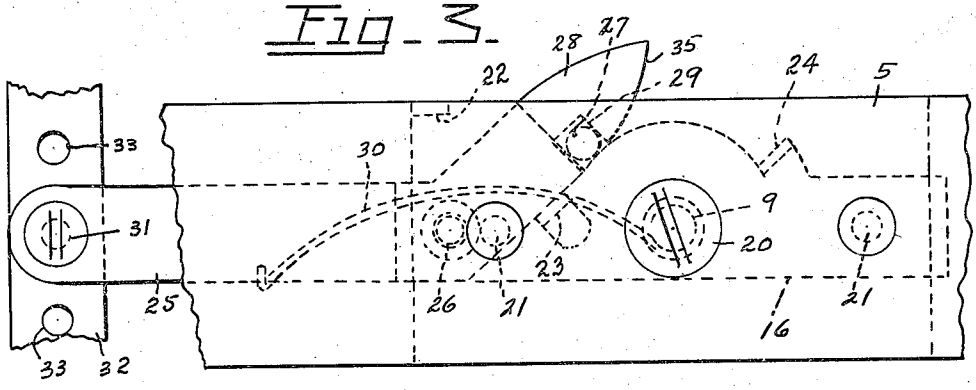


Fig. 4.

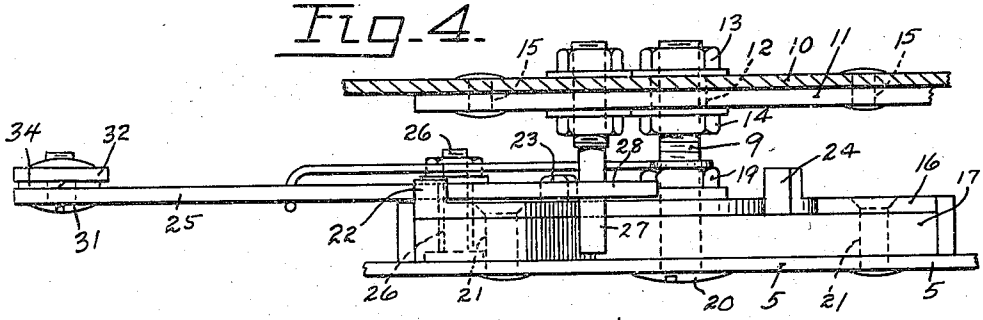


Fig. 5.

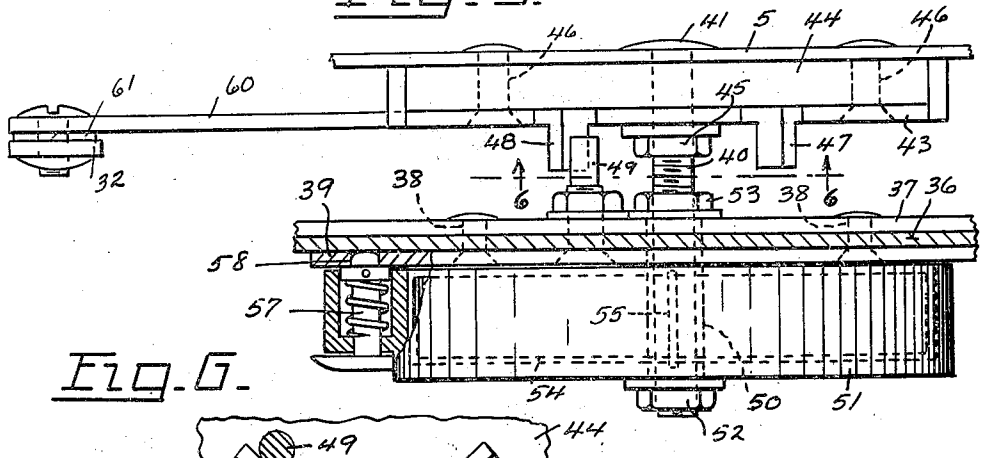
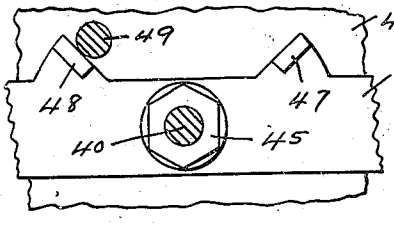


Fig. 6.



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WELDER'S HOOD

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Application February 17, 1943, Serial No. 476,136

12 Claims. (Cl. 2—8)

This invention relates to a welder's hood.

One of the objects of the invention is the provision of a hood that may be quickly raised and lowered by a welder without necessitating the use of the welder's hands and which hood, when in lowered operative position for protecting the face and eyes of the welder, is positively locked in such position.

Another object of the invention is the provision of an improved hood having means releasably locking the same in position over the face of the welder when the latter is welding, and which hood carries means actuatable by downward movement of the jaw of the wearer for releasing the hood for movement of the hood under a source of power to an elevated position uncovering the wearer's face, said hood being held by said source when in said elevated position.

A still further object of the invention is the provision of an improved welder's hood that is spring urged to and is yieldably held, in an elevated position over the head of a wearer so as to permit unobstructed vision to the wearer's eyes, and which hood is adapted to be swung from such position against the tension of a spring to a locked position in which the hood is over the face of the wearer, by a sharp nod of the head and from which latter position the hood is releasable for return to the elevated position by means actuatable by movement of the lower jaw of the wearer.

An additional object is the provision of a head band of head piece adapted to be carried by the head of a welder, and which head piece pivotally supports a hood for swinging from a position covering the welder's face to a position over the head of the welder in which latter position the face is uncovered, said head piece including a chin strap adapted to cause actuation of means for pivoting the hood to a position over the head of the welder, and which chin strap is so associated with the hood and head piece as to cooperate therewith for stabilizing the hood in all positions thereof and during its pivotal movement, and which strap is also connected with the head piece in a manner to prevent accidental movement thereof away from the position in which it is actuatable by movement of the chin.

In conventional welding hoods, the main hood portion carrying the glass or plastic covered window opening is pivotally supported on a head band for swinging to and from substantially the same positions as the hood hereinafter described, but friction means is provided for holding the hood in its several positions. To raise the hood the welder must use one hand, thus either releasing the rod or the piece of work. In precarious situations, as on high buildings or ships' masts, or scaffolding, etc., the welder frequently must hold onto a support with one hand and hold the rod with the other. In many instances when the welder releases his hold on a support to lift the hood, he looses his balance or is blown off balance and is fatally injured or maimed. In even the most favorable circumstances, accidents occur by reason of the necessity for the welder's releasing one hand or the other to lift the hood.

With the mask of this invention the hood is under the full control of the wearer's head for lifting and lowering thereof, thus eliminating the hazard encountered in hoods requiring the use of the hand.

In conventional hoods, the latter are not ordinarily positively held in face covering position, since friction joints are used. With our invention the hood is positively held locked in face covering position irrespective of how the head is tilted or moved, and with this invention the hood cannot accidentally fall off the wearer's head or become shifted when in operative position, and it is held in elevated position when not in use by a predetermined constant force that is independent of reliance upon friction means.

We are aware of the fact that means of various kinds have been developed for raising and lowering the eye glass portion of the hood, and that various counterbalancing means have also been used in efforts to facilitate moving the hood, but in some or all of these prior attempts of which we are aware, either the mechanical complexities have proven unreliable and objectionable, or else the hood has been too heavy or new objections such as undesirable exterior projections and restrictions in the desired manner of operation of the hood have been introduced.

In the drawings, Fig. 1 is a vertical sectional view through a hood when the latter is in operative, face-covering position, and the hood is indicated in dot-dash lines in inoperative position. The head piece within the hood is in elevation and partly broken away.

Fig. 2 is a fragmentary elevational view of the upper portion of the hood with one of the exterior elements (spring case) broken away and partly in section.

Fig. 3 is an enlarged fragmentary elevational view of the hood actuating elements at one side of the head piece, the elements being indicated

in dotted line behind one side of the head encircling band.

Fig. 4 is a plan view of the portion shown in Fig. 3 with the body of the hood being indicated in cross section.

Fig. 5 is a plan view of the portion of the hood actuating elements at the side of the hood that is opposite the elements of Fig. 4, the hood being shown in cross section, and the case enclosing the detent for adjusting the spring enclosing case being also in cross section.

Fig. 6 is a fragmentary sectional view taken along line 6—6 of Fig. 5.

In detail, the main body portion 1 of the hood itself may be substantially conventional in shape, having a horizontally elongated window opening carrying the glass elements 2 that are normally in front of the eyes of the welder. Preferably the upper end of the hood is covered by a rearward extension 3 that extends over the top of the wearer's head to afford protection to the head which feature is not used in conventional hoods. Also a rearward extension 4 at lower end of the hood will extend below the wearer's chin to protect the throat and chin.

Within the concave side of the hood and above the level of the glass 2 is a head piece that comprises an annular band 5 that is adapted to encircle the head and closely fits the latter, while a band 6 may be connected at its ends to band 5, the band 6 extending over the head. The band 5 may be in one strip with overlapping ends respectively slotted for adjustably securing said ends together by a bolt 7, and which bolt may also extend through a slot in the end of band 6, thus enabling the adjustment of the head bands to various sized heads. This feature is old in welding hoods generally, and is therefore, not shown in detail.

The hood 1 is pivotally connected to band 5 by horizontally aligned pivots respectively positioned at opposite sides of the hood as will be later described more in detail. These pivots support the hood for swinging from the full-line position in Fig. 1 to the position 8 indicated in dot-dash line, and vice versa. The head band itself should remain stationary on the wearer's head during this swinging of the hood.

It is highly desirable that the entire hood (except for the head piece) should swing since the purpose of so swinging the hood is to enable the welder to observe his work at intervals, and unless the entire hood is lifted, the hood would interfere with the vision. This interference with vision is one of the main objections to previous attempts to merely move the glass away from the window opening.

Referring to Figs. 3, 4, a pivot means, such as a bolt or shaft 9, pivotally connects one side 10 (Fig. 3) of the hood with the head band 5. The bolt 9 may extend through the side 10 and through a reinforcing plate 11 that is secured to said side. A sleeve 12 in the aligned openings in side 10 and plate 11 through which bolt 9 passes encloses the bolt and is secured between nuts 13, 14. The sleeve spaces the nuts so that the side 11 and plate 13 are free to revolve on the sleeve 12.

The plate 11 may be tightly secured to the side 12 by any suitable means, such as by rivets 15.

The inner end of bolt 9 (the end inside the hood) carries a metal plate 16, stiffener piece 17 and one side of head band 5, which plate, piece and band are securely held together and rigid on bolt 9 between a nut 19 and the head 20 of the bolt. Also, rivets 21, or the like, may secure the plate, piece, and band rigidly together.

The plate 16 is on the side of the piece 17 nearest the plate 11 and carries projections 22, 23, 24 projecting laterally toward plate 11 (Figs. 3, 4).

A latch arm 25 is pivotally supported on a bolt or pin 26 that is positioned forwardly of bolt 9 with respect to the forward side of the hood, said bolt 26 being secured to the plate 16 and to stiffener piece 17 at one of its ends with the latch arm 25 being positioned on the opposite end of the bolt between plates 16, 11 and adjacent the former.

Projecting inwardly of plate 11 and extending transversely across the upper edge of plate 16 is a pin 27 that is rigidly secured to plate 11 and side 10. This pin 27 is positioned between bolts 9, 27 and at a level somewhat above that of said bolts.

An extension 28 on arm 25 forming a latch element extends in a generally upwardly direction and over the pin 11. The underside of the latch element 28 is formed with a downwardly opening recess 29 (Fig. 3) that is adapted to receive the pin therein upon generally downward swinging of the end 28, thus locking the plate 16, piece 17, and the side of the band that is adjacent the latter against rotation relatively about the axis of bolt 9.

This locking relation above described is maintained by a spring 30 that is secured at one end thereof to bolt 9 and that engages arm 25 forwardly of bolt 26 at its other end. This spring is held bowed under tension by the bolt 26, over which it passes, thereby constantly and yieldably urging the latch end 28 of the arm to a position holding the recess 29 in the path of travel of pin 11. The projection 23 on plate 16 functions to hold the latch end 28 in said position when the latch arm 25 is released from a downward pull thereon while the projection 22 on said plate limits the upward swinging of end 28 when the latch arm 25 is pulled downwardly to release the pin 27 from recess 29. The upper edges of plate 16 and stiffener 17 extend transversely and slantingly upwardly across the pin 27 adjacent projection 23 for stopping relative movement of the band 5 and hood at one end of the movement of pin 29 and when the pin is in recess 29.

A pin or bolt 31 at the forward end of arm 25 secures one end of a chin strap 32 to said arm. The strap 32 is provided with a row of openings 33 for said bolt to provide for adjustment of the strap, said bolt being adapted to extend through any one of said openings, and a friction washer 34 is provided to maintain a predetermined frictional resistance to rotation of the strap on the bolt relative to arm 25 so as to hold the strap in any desired position, such as under the chin of the wearer.

The projection 24 on plate acts as a stop for engaging the pin 11 when the latter is released from recess 29 in the end 28 of the arm 25. Thus, upon such release of said pin, the hood may revolve to carry pin 11 through about a 90° arc, or utnil said pin strikes projection 24. Upon swinging the hood back to the position shown in Fig. 1, the pin will engage the cam surface 35 (Fig. 3) of latch 28 to raise the latter for passage of the pin to below and into recess 29 where the latch will hold the pin locked in the recess 29 until the arm 25 carrying strap 32 is pulled downwardly for releasing the pin.

Fig. 5 shows the side 36 of the hood opposite the side 10 thereof.

Side 36 of hood 1 carries a stiffener piece 37 (like stiffener 11) secured thereto by rivets 38 or the like, and which rivets also hold a plate 39 rigid against the outer side of the hood.

A shaft 40 coaxial with bolt 9 extends through openings in plate 39, side 36, and stiffener piece 37, and projects outwardly of plate 39 and inwardly of piece 37 at its opposite ends. The inwardly projecting end of shaft 40 is headed as at 41 and is threaded for tightly securing a plate 43, stiff reinforcement piece 44, and one side of head band 5 between said head and a nut 45 on said shaft. Also rivets 46, or the like, may secure the band 5, stiffener 44 and plate 43 rigidly together.

The plate 43 is adjacent the piece 37 and has projections 47, 48 projecting toward the latter.

A pin 49 is rigidly secured to plate 39, side 36, and stiffener 37, and projects parallel with shaft 40 from stiffener 37 toward plate 43. Upon revolving pin 49 about the axis of shaft 40 when the band 5 and hood-side 36 are rotated relatively, the pin will move through the same degree arc as pin 27 and will engage the projection 48 at the same time pin 11 engages the upwardly inclined edge of plate 16, which edge functions as a stop for pin 11 when the latter is in the position shown in Fig. 3.

When the pin 49 moves in the opposite direction it will engage projection 47 on plate 43 at substantially the same time pin 27 engages projection 24 on plate 16.

The shaft 40 has a sleeve 50 on its end projecting through the side 36, and outwardly of the plate 39 is a generally cylindrical housing 51 rotatable on said sleeve and held therein by a nut 52. A nut 53 threaded on shaft 40 adjacent stiffener 37 engages the inner end of sleeve 50, and the portion of the sleeve 50 that extends through plate 39, side 36, and stiffener 37 rotatably supports said plate, side and stiffener thereon.

Within the housing 51 is a flat spiral spring 54 (Fig. 2) one end of which extends through aligned slots 55 in sleeve 50 and shaft 40, while the opposite end 56 extends through an opening in one side of the housing.

The spring 54 may be wound up under tension by rotating the housing 51 while holding shaft 40 and the side 36 of the hood stationary, and is then locked to the hood under the desired tension by means of a spring urged pin 57 (Fig. 5) that is carried by housing 51, and which pin is adopted to be yieldably urged into one of several holes 58 formed in plate 39 (Fig. 2). The pin 58 has a head 59 by which a finger of the operator may withdraw the pin from one of holes 58 for rotating the housing 51 to increase or to decrease the degree of tension on spring 54. This row of holes 58 may extend completely around the housing 51, thus enabling the operator to obtain any degree of tension on the spring.

An arm 60 is secured at one end to plate 43 and extends forwardly from the latter parallel to arm 25. To the forward end of arm 60 is pivotally secured the end of chin strap 32 that is opposite the end that connects with arm 25 and a friction washer 61 like washer 34 is interposed between strap 32 and arm 60 to prevent free swinging of the strap whereby the latter will remain in any adjusted position to which it may be moved by the hand.

The body of the hood and strap 32 may be of the usual hard pressed fiber material of which hoods are made, although the strap may be of any desired material that is flexible but semi-rigid, so that its U-shaped contour will be retained and so that it may be readily swung on its pivots by moving the wider portion 62 (Fig. 1) that extends under the wearer's chin.

In operation (assuming the head band 5 and strap 32 are adjusted to the wearer's head), the band 5 is positioned on the head so as to support the hood in proper position and strap 32 is slipped under the chin when the lower jaw is substantially closed. The hood 1 may be in the dot-line position 8 (Fig. 1) when the head band is so fitted, in which position the spring 54 is adapted to yieldably hold the hood in said position irrespective of whether the wearer's head is tilted forward, or is straight, or tilted backward. Pin 27 in this position engages projection 24 while pin 49 engages projection 47.

A relatively sharp, forward, single nod of the head is all that is required to swing the hood to the full line position of Fig. 1 in which pin 27 is positively and automatically locked in said forward position due to its locking engagement with latch 28. The downward swinging movement of the hood is arrested by the pin 27 engaging the upwardly inclined edge of plate 16, and by pin 49 engaging projection 48.

The welder may now work with perfect assurance that the hood will not swing out of position by any unusual movement of the head, whether he or she is doing overhead welding or is doing other work in which the head is straight or is tilted forward or to either side.

When the welder wishes to observe or change the work or to change position, it is only necessary to move his or her lower jaw downwardly, thus pulling arm 25 downwardly and thereby releasing pin 27 from the latch. Spring 54, which is under tension, then quickly swings the hood upwardly and holds the hood in dot-line position 8 of Fig. 1 until a forward, sharp nod of the head restores the hood to the full line position.

It is pertinent to note that the friction washers 34, 61 at the ends of the chin strap, together with the semi-rigidity of said strap, will result in holding said strap in operative position for actuation thereof by the lower jaw without necessitating a tight, uncomfortable fit. Thus, the welder may talk without causing a release of the hood and may still operate the latch by the lower jaw if he desires a fairly loose fitting chin strap.

The chin strap also will function to stabilize the hood on the head since it will function to prevent any tendency of the hood to fall off the head during work or when the hood is swung to either its full line position of Fig. 1 or to the dot-dash line position 8 of said figure.

For certain work, greater tension of spring 54 may be desired, which is readily obtained by the means described.

It is to be understood that the drawings are merely illustrative of the invention and are not to be considered restrictive to the exact elements employed. For example, the various stiffeners and reinforcing elements, such as pieces 11, 17, 44, 37, may be of various forms, or the hood itself may be from material pressed to the desired form in which the stiffeners are integral with the hood. Also, the various pivots may be modified to facilitate economy of manufacture, and the several stops and pins can be modified. Pin 49 and stops or projections 47, 48 are not absolutely necessary, but they reduce the tendency of the hood to twist relative to the head band due to

sudden stoppage of the torque force created by pivoting of the hood on the head band. By stopping both sides of the hood at the same time, there is no undesirable strain on the pivots.

Having described the invention, we claim:

1. A welder's hood, a head-fitting member on which said hood is pivotally supported for swinging from face-covering position to an elevated position over the head of the wearer; a mechanism for releasably locking said hood to said member when the hood is in face-covering position and movable to a position releasing said hood for swinging of the latter to said elevated position, and means connected with said hood automatically actuatable upon such movement of said mechanism for swinging said hood to said elevated position.

2. A welder's hood, a head-fitting member on which said hood is pivotally supported for swinging from face-covering position to an elevated position over the head of the wearer; a mechanism for releasably locking said hood to said member when the hood is in face-covering position and movable to a position releasing said hood for swinging of the latter to said elevated position, and means connected with said hood automatically actuatable upon such movement of said mechanism for swinging said hood to said elevated position, and for holding said hood in said elevated position.

3. A welder's hood, a head-fitting member on which said hood is pivotally supported for swinging from face-covering position to an elevated position over the head of the wearer; a mechanism for releasably locking said hood to said member when the hood is in face-covering position and movable to a position releasing said hood for swinging of the latter to said elevated position, and a spring held under tension by said mechanism and connected with said hood automatically actuatable upon such movement by said mechanism for swinging said hood to said elevated position, said spring being arranged and adapted to yieldably hold said hood in said elevated position.

4. A welder's hood, a head-fitting member on which said hood is pivotally supported for swinging from face-covering position to an elevated position over the head of the wearer; a mechanism for releasably locking said hood to said member when the hood is in face-covering position and movable to a position releasing said hood for swinging of the latter to said elevated position, and means connected with said hood automatically actuatable upon such movement of said mechanism for swinging said hood to said elevated position; said mechanism including a latch pivotally supported on said member and an element on said hood engaged by said latch, said latch having an extension connected therewith engageable by the lower jaw of the wearer for causing movement of said latch from said element upon downward movement of the lower jaw of the wearer.

5. A welder's hood, a head piece pivotally supporting said hood for swinging thereof on said head piece from face-covering position to an elevated position over the head of the wearer, interlocking elements on said head piece and on said hood respectively for holding said hood in said face-covering position and movable relatively to unlocked position releasing said hood for swinging of the latter to said elevated position, a spring connecting said hood and said head piece and held by said elements under tension when the latter are interlocked for so swinging said hood upon movement of said elements to said unlocked position; a chin strap engageable with the lower jaw of a wearer and connected with said elements for causing said movement of the latter to unlocked position upon downward movement of said jaw.

6. A welder's hood, a head piece pivotally supporting said hood for swinging thereof on said head piece from face-covering position to an elevated position over the head of the wearer, interlocking elements on said head piece and on said hood respectively for holding said hood in said face-covering position and movable relatively to unlocked position releasing said hood for swinging of the latter to said elevated position, a spring connecting said hood and said head piece and held by said elements under tension when the latter are interlocked for so swinging said hood upon movement of said elements to said unlocked position; a chin strap engageable with the lower jaw of a wearer and connected with said elements for causing said movement of the latter to unlocked position upon downward movement of said jaw, stop members on said hood and head piece for limiting the swinging of said hood to said face-covering end elevated positions.

7. A welder's hood, a head piece pivotally supporting said hood for swinging thereof on said head piece from face-covering position to an elevated position over the head of the wearer, interlocking elements on said head piece and on said hood respectively for holding said hood in said face-covering position and movable relatively to unlocked position releasing said hood for swinging of the latter to said elevated position, a spring connecting said hood and said head piece and held by said elements under tension when the latter are interlocked for so swinging said hood upon movement of said elements to said unlocked position; a chin strap engageable with the lower jaw of a wearer and connected with said elements for causing said movement of the latter to unlocked position upon downward movement of said jaw, and means for varying the tension of said spring as desired.

8. A welder's hood, a head-fitting piece adapted to stationarily fit on the head of the wearer, a pair of coaxial pivots carried by said head piece connected with opposite sides of said hood and pivotally supporting said hood for swinging from face-covering position to an elevated position over the head of the wearer, a coil spring connected at its ends with said head piece and hood respectively for so swinging said hood, means for varying the tension of said spring, a latch releasably locking said hood in said face-covering position from movement of the hood under the force of said spring to said elevated position, a chin strap connected with said latch for actuation of the latter to release said hood for said movement upon downward force of the lower jaw of the wearer against said chin strap.

9. A welder's hood, a head-fitting piece adapted to stationarily fit on the head of the wearer, a pair of coaxial pivots carried by said head piece connected with opposite sides of said hood and pivotally supporting said hood for swinging from face-covering position to an elevated position over the head of the wearer, a coil spring connected at its ends with said head piece and hood respectively for so swinging said hood, means for varying the tension of said spring, a latch releasably locking said hood in said face-covering po-

sition from movement of the hood under the force of said spring to said elevated position, a chin strap connected with said latch for actuation of the latter to release said hood for said movement upon downward force of the lower jaw of the wearer against said chin strap, said latch including a latch arm pivotally supported on said head piece intermediate the ends of said arm, one end of said strap being connected to one end of said arm, a hook on the opposite end of said arm and a member secured to said hood adapted to be held in said hook when said hood is in face covering position and the jaw of the wearer is substantially closed so as to free said chin strap for upward movement thereof.

10. A welder's hood, a head-fitting piece adapted to stationarily fit on the head of the wearer, a pair of coaxial pivots carried by said head piece connected with opposite sides of said hood and pivotally supporting said hood for swinging from face-covering position to an elevated position over the head of the wearer, a coil spring connected at its ends with said head piece and hood respectively for so swinging said hood, means for varying the tension of said spring, a latch releasably locking said hood in said face-covering position from movement of the hood under the force of said spring to said elevated position, a chin strap connected with said latch for actuation of the latter to release said hood for said movement upon downward force of the lower jaw of the wearer against said chin strap, said means for varying the tension of said spring comprising a housing rotatably supported on one of said pivots and enclosing said spring, one end of said spring being secured to said housing and the opposite end of said spring being secured to the pivot that so supports said housing, said last mentioned pivot being secured rigid with said head piece.

11. A welder's hood pivotally supported on a head-fitting member for swinging of said hood on said member from face-covering position to an elevated position over the wearer's head, a chin engaging element adapted to engage the under side of the wearer's jaw when said member is fitted on the wearer's head for downward movement of said element upon demand movement of said jaw, a mechanism connected with said element and with said member releasably holding said hood in face-covering position against said swinging of the hood and actuatable by downward movement of said element for releasing said hood for said swinging of the latter, said hood being swingable on its pivots to said face-covering position from said elevated position by the inertia of a relatively sharp forward nod of the wearer's head, and power means connected with said hood automatically actuatable upon release of said hood when the latter is in face-covering position for moving said hood to said elevated position thereof.

12. A welder's hood pivotally supported on a head-fitting member for swinging of said hood on said member from face-covering position to an elevated position over the wearer's head, a chin engaging element adapted to engage the under side of the wearer's jaw when said member is fitted on the wearer's head for downward movement of said element upon demand movement of said jaw, a mechanism connected with said element and with said member releasably holding said hood in face-covering position against said swinging of the hood and actuatable by downward movement of said element for releasing said hood for said swinging of the latter, said hood being swingable on its pivots to said face-covering position from said elevated position by the inertia of a relatively sharp forward nod of the wearer's head, and power means connected with said hood automatically actuatable upon release of said hood when the latter is in face-covering position for moving said hood to said elevated position thereof, pivots supporting said element for swinging to and from a position under said lower jaw, and means for holding said element against accidental swinging thereof when the element is in position under said lower jaw.

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