July 22, 1947. J. MARTIN 2,424,245

HOOD FOR THE COCKPITS OF AEROPLANES

Filed July 8, 1944 4 Sheets-Sheet 1

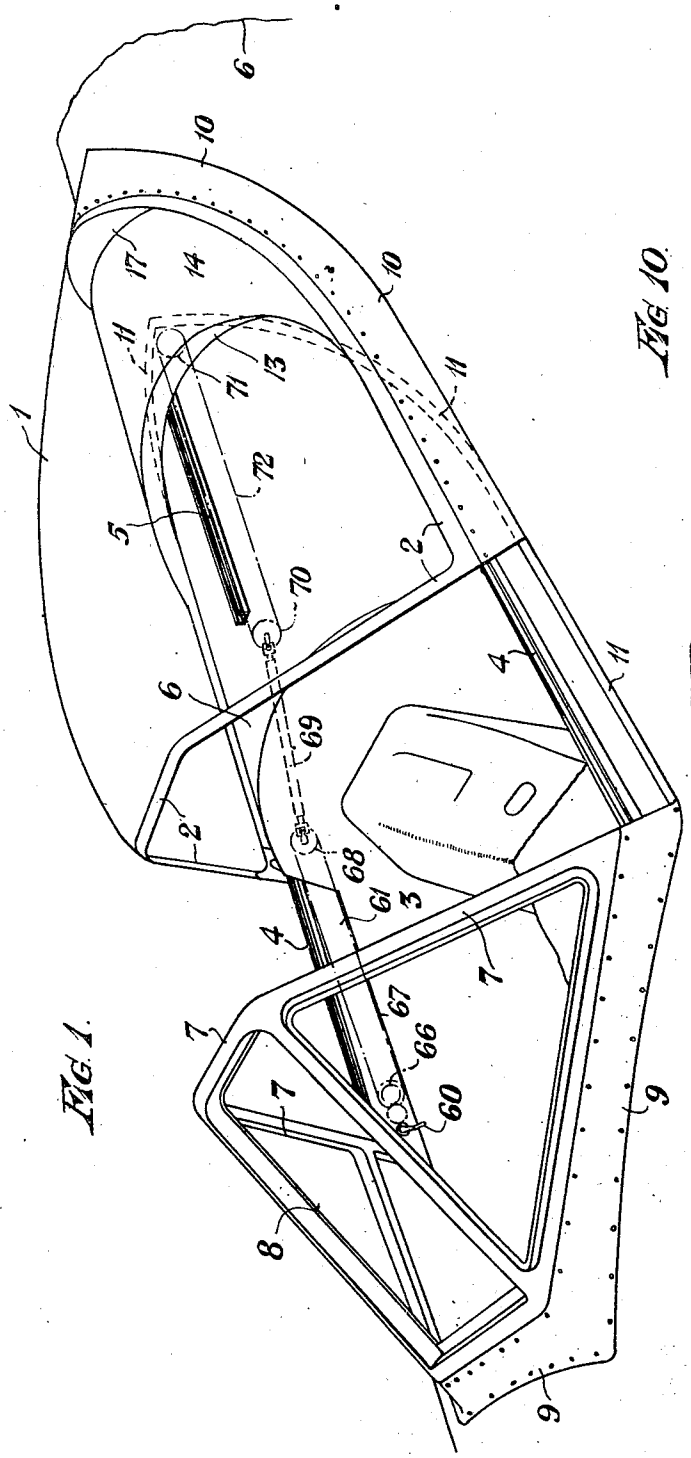


FIG. 1.

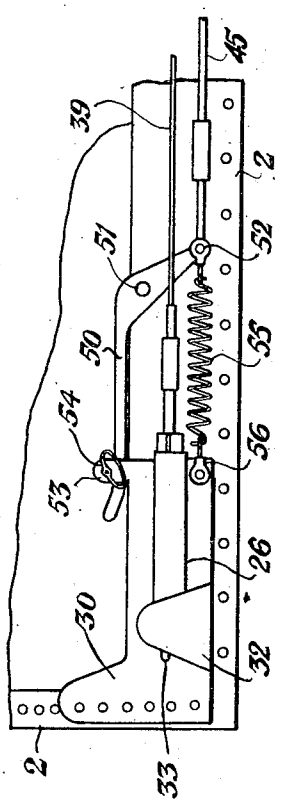


FIG. 10.

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HOOD FOR THE COCKPITS OF AEROPLANES

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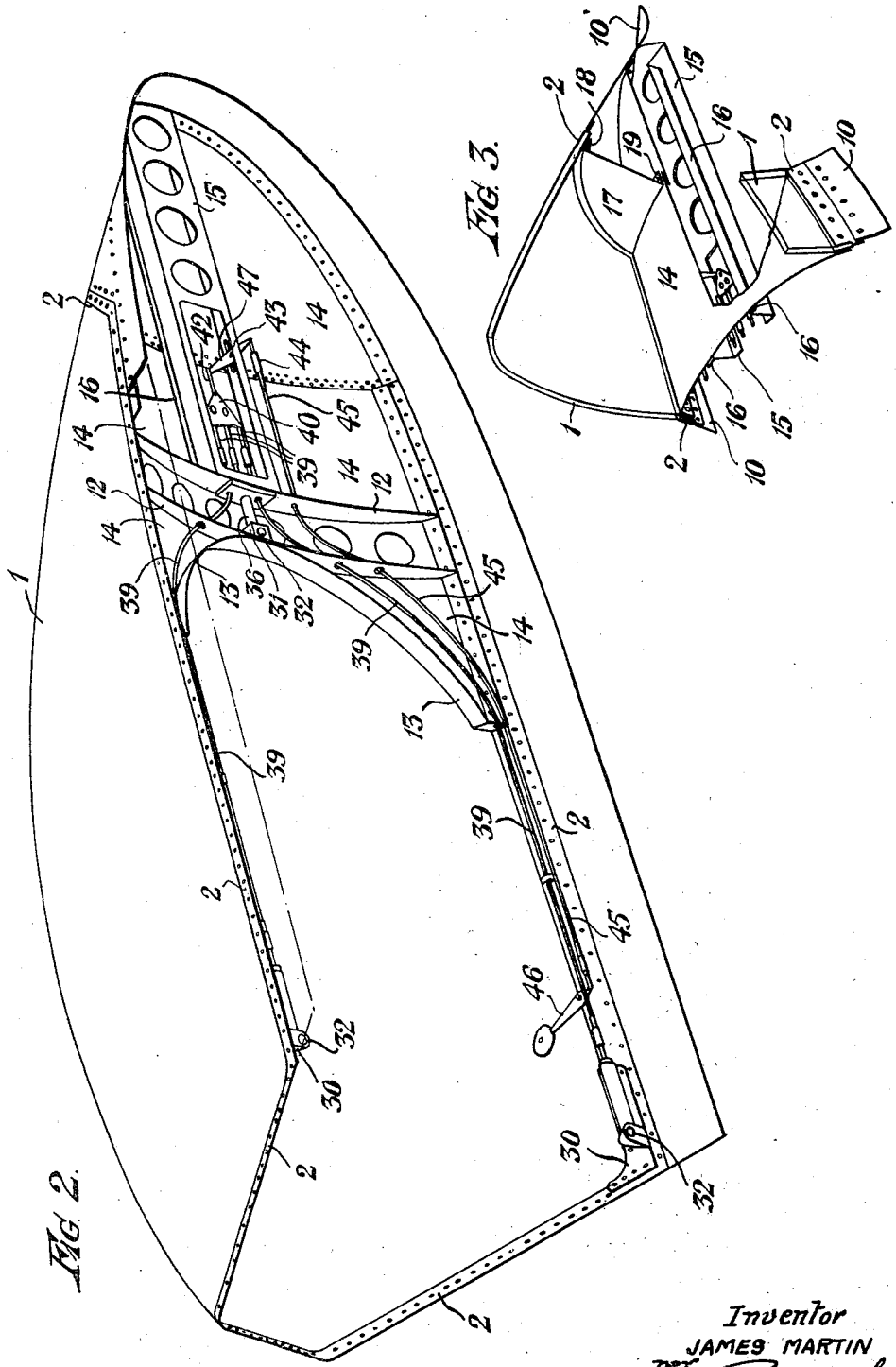


FIG. 2.

FIG. 3.

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HOOD FOR THE COCKPITS OF AEROPLANES

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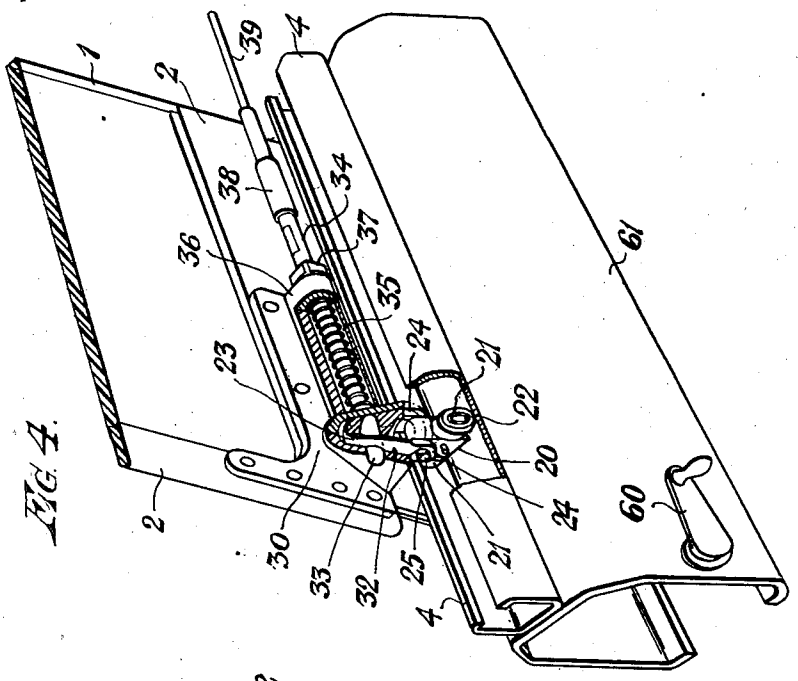


FIG. 4.

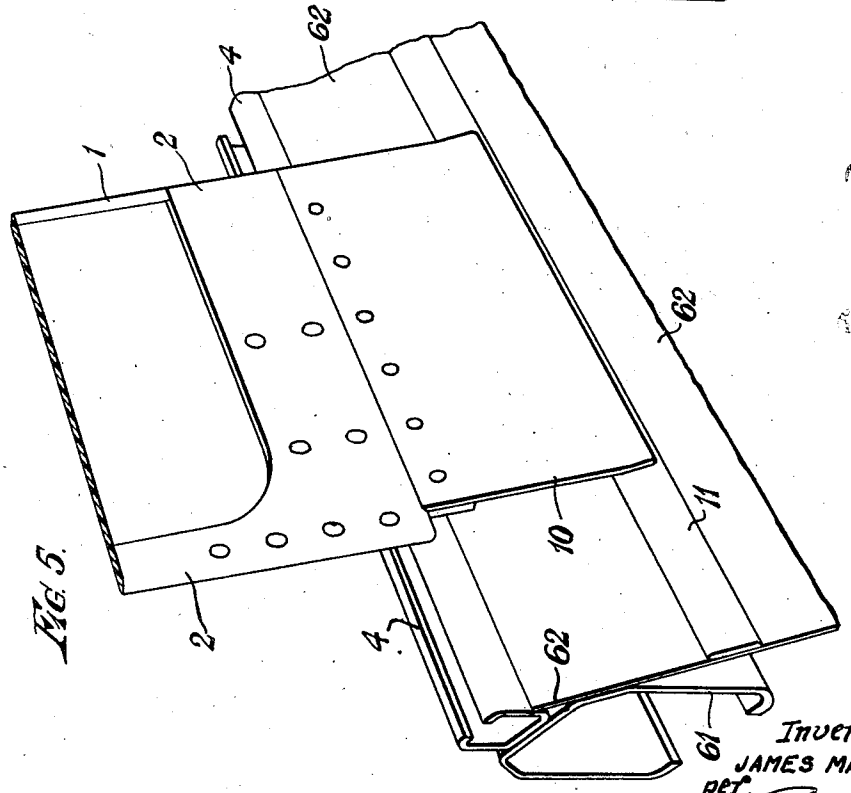


FIG. 5.

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HOOD FOR THE COCKPITS OF AEROPLANES

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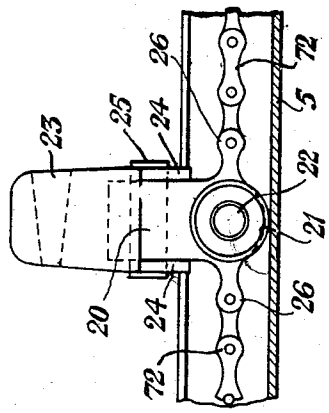


FIG. 8

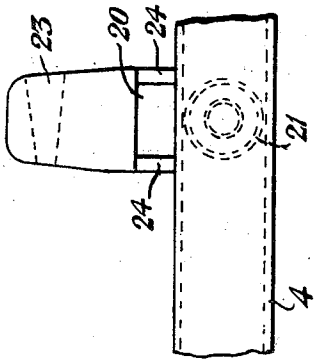


FIG. 7

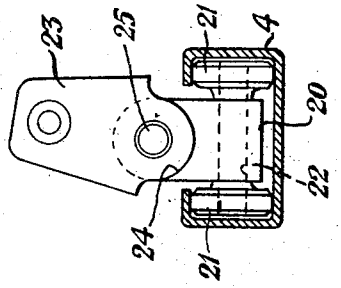


FIG. 6

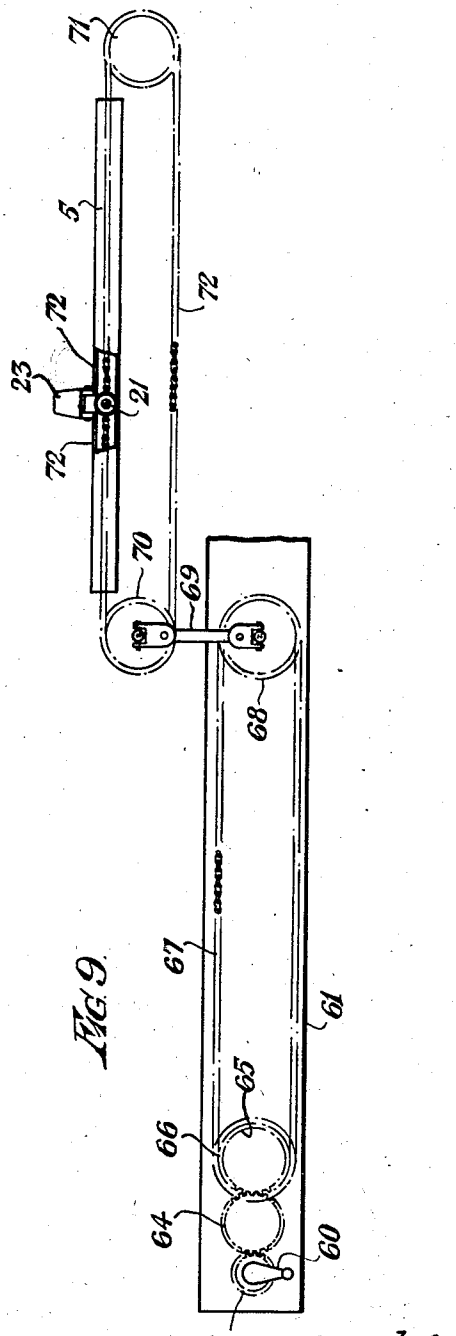


FIG. 9

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2,424,245

HOOD FOR THE COCKPITS OF AEROPLANES

James Martin, Higher Denham, near Uxbridge, England

Application July 8, 1944, Serial No. 544,075
In Great Britain August 1, 1943

4 Claims. (Cl. 244—121)

1

This invention comprises improvements in and relating to hoods for the cockpits of aeroplanes and particularly to a type of hood which is adapted to slide upon suitable guides on the aeroplane structure and which may also be provided with simple means for instantly releasing the hood, in an emergency, to enable the occupant or occupants to escape from the cockpit by parachute or otherwise.

An object of the invention is to provide a strong, light and neat form of hood for an aeroplane cockpit which may be of a good streamline form, which will give a clear unobstructed view all around the pilot or observer and which may be readily opened and closed for purposes of ventilation or for access to the cockpit and which may be instantly released from its supports to permit an emergency escape of the pilot or other occupants from the cockpit of the aeroplane.

By way of example and in order to enable the invention to be clearly understood a construction of the invention suitable for use with a high speed fighter aeroplane will now be described in detail with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of part of an aeroplane showing the sliding hood in the open position.

Fig. 2 is a perspective view of the hood detached from the aeroplane and looking upwardly into the hood.

Fig. 3 is a broken perspective view of part of the monocoque tail end of the hood.

Fig. 4 is a fragmentary perspective view showing one of the slidable carriages and the method of detachably securing the front of the hood thereto.

Fig. 5 is a fragmentary perspective view of a front corner of the hood looking at the outside thereof.

Figs. 6 and 7 are respectively end view and side elevation of one of the slidable carriages to which the front end of the hood is detachably secured.

Fig. 8 is a side elevation of the center rear slidable carriage to which the tail of the hood is secured and showing the traversing chain by which it is moved to and fro in its guide.

Fig. 9 is a diagrammatic view illustrating a suitable method of transmitting motion from an operating handle in the cockpit to the rear slidable carriage for the purpose of opening and closing the hood, and

Fig. 10 is a modified release device.

Referring to the drawings, the hood 1 comprises a single sheet of strong, clear, transparent synthetic resin or other suitable material moulded to the well streamlined shape shown in Figs. 1 and 2 of the drawings. Around the front and lower edge of the transparent sheet is secured the metal frame 2. The hood is mounted over the cockpit of the aeroplane and slides on two guides 4 arranged one at each side of the cockpit 3 and a rear centre guide 5 mounted on the upper surface of the fuselage 6 at the rear of the cockpit 3. In Fig. 1 the hood is shown moved back along its guides to provide access to the cockpit 3 but when the hood is moved forward, its front edge engages with the frame 7 of the windscreen 8 which is securely anchored at the front of the cockpit and a flexible fairing 9 is provided at the junction of the windscreen and the upper surface 6 of the fuselage. The lower edge of the hood is also provided with a resilient fairing strip 10 part of which is omitted in Fig. 2. This fairing strip 10 engages along its whole length with the continuous slightly raised rubbing strip 11 mounted on the fuselage to coincide with the fairing strip 10 when the hood is in the closed position. When the hood is opened the front end of the fairing strip slides freely along the rubbing strip 11 whilst the rear end of the hood disengages from the rubbing strip and stands clear of the fuselage so as not to damage the surface thereof.

The constructional features of the hood are more clearly shown in Figs. 2, 3, 4 and 5. The tail end of the hood is of rigid monocoque construction as seen in Figs. 2 and 3. This is effected by providing the inverted channel section arched bridge 12 which connects the lower metal frame 2 of the two sides of the hood. This is further braced to the side frame 2 by the curved members 13 and the whole is enclosed and greatly stiffened by the sheet metal covering 14 which completely encloses the underside of the tail section. The whole structure is further stiffened by the longitudinal channel 15 secured at its forward end to the bridge 12 and to the extreme end of the hood at its other end and having outwardly turned flanges 16 by which it is secured to the metal covering 14. Further stiffness is added by the tail end bulkhead 17 which is secured by its flanged edge 18 to the frame 2 and by the lower flange 19 to the metal covering 14.

The hood is mounted on the aeroplane by means of plug and socket connections to slidable carriages mounted in guides on the aeroplane body. In the arrangement shown in the draw-

ings, three carriages are provided one in each of the guides 4 at the side of the cockpit and one in the guide 5 at the back of the cockpit. The carriages are shown in Figs. 6, 7 and 8. Each carriage comprises a body 20 provided with a pair of rollers 21 mounted on a spindle 22 rotatable in the body 20. Mounted on the body 20 is the tapered plug 23 which engages the body by means of the forked lower part 24 pivotally connected to the body by means of the pivot pin 25 arranged at right angles to the roller spindle 22. The plug 23 is thus able to swing about the roller spindle 22 and also about the pivot pin 25 at right angles thereto and is therefore able to adjust itself freely to avoid any binding of the carriages in their guides. In Fig. 8 the body 20 of the carriage which slides in the guide 5 is provided with eye-brackets 26 at the back and front thereof for the attachment of a chain by which the carriage and the hood may be traversed backward and forward for the purpose of opening and closing the hood.

The hood is mounted on the slidable carriages arranged in the guides 4 and 5 by means of two brackets 30 at the front corners of the hood and a block 31 on the transverse bridge 12. Each of these brackets 30 and the block 31 is provided with a tapered socket 32 which fits over the plug 23 on one of the slidable carriages. Each plug 23 and socket 32 is secured together by a transverse locking pin. One of the brackets 30 with the slidable carriage is shown in detail in Fig. 4. The bracket 30 is riveted to the frame 2 of the hood 1 and the tapered socket 32 fits closely over the tapered plug 23 and the two are locked together by the tapered locking pin 33. The tapered locking pin 33 is formed on the end of the slidable spindle 34 which is surrounded by a spring 35 which urges the locking pin 33 into engagement with the plug 23 and socket 32. The locking pin 33 and its spindle 34 and spring 35 are located in the housing 36 on the bracket 30 and a part of this housing is broken away in Fig. 4 to show the spindle and spring. A squared collar 37 is screwed into the end of the housing 36 to retain the spring 35 therein. The spindle 34 of the locking pin 33 is connected by a coupling 38 to a release cable 39 by which the locking pin may be retracted to release the socket 32 from the plug 23 on the slidable carriage mounted in the guide 4 at the side of the cockpit 3. A similar arrangement of locking pin is provided with the socket 32 in the block 31 which engages with the tapered plug 23 of the carriage which is mounted to slide in the rear guide 5.

The locking pin 33 of each of the sockets 32 is connected by a release cable 39 to the single coupling plate 40 which is connected to an operating lever 41 by a pull rod 42. The operating lever is pivotally supported at 43 on one side of the longitudinal channel 15 in the tail of the hood as shown in Fig. 2. The other end of the operating lever is connected by an adjustable coupling 44 to an operating cable 45 connected at its other end to a hand lever 46 pivoted on the frame 2 of the hood at a convenient position where it will be readily accessible to the pilot or other occupant of the cockpit. The release cables 39 and operating cable 45 may be enclosed in an outer guide sheath. In an emergency the lever 46 is pulled sharply back so that the operating cable 45 will turn the operating lever 41 about its pivot 43 pulling back the plate 40 and all three of the release cables 39. This will withdraw all the locking pins 33. All three sockets 32 will thus be

simultaneously released from the tapered plugs 23 on the slidable carriages in the guides 4 and 5 and the hood is freed for jettisoning. The taper of the locking pins 33 and the plugs 23 and sockets 32 is sufficient to ensure that they will not bind, thus ensuring a ready and instantaneous release of the hood.

An alternative arrangement of release lever is illustrated in Fig. 10 in which the release lever 50 is pivoted to the frame 2 at 51 and is connected to the operating cable 45 at 52. The lever is turned in a forward direction until it engages in the clip 53 formed on the bracket 30 in which position it is secured by the release pin 54. A strong spring 55 is anchored by a link 56 to the bracket 30 on the frame 2 and this spring exerts a constant pull on the release lever. When it is required to release the hood for jettisoning, the release pin 54 is withdrawn, the spring 55 will turn the lever 50 about its pivot and exert a strong pull on the operating cable 45 so as to withdraw the locking pins 33 and release the hood.

Operating means for opening and closing the hood by hand is illustrated diagrammatically in Figs. 1 and 9. For this purpose an operating handle 60 is mounted in a bearing in the inner face of one of the inverted channel shaped members 61, one of which is located at each side of the cockpit 3 (shown more particularly in Figs. 4 and 5). The guides 4 are mounted on these inverted channel shaped members 61 and the outer skin 62 of the aeroplane fuselage is supported on this channel 61 as shown in Fig. 5. The handle 60 carries on the inner end of its spindle a toothed pinion 63 which gears with a toothed gear wheel 64, which again gears with a further gear wheel 65 to reverse the direction of rotation. One of these gears may however be omitted if desired. The gear wheel 65 is mounted on the same spindle as a sprocket wheel 66. A chain 67 is mounted on this sprocket wheel 66 and a further sprocket wheel 68 located behind the rear end of the cockpit 3. The spindle of the sprocket 68 is connected by a shaft 69 and two universal joints to a sprocket wheel 70 located in line with the front end of the guide 5. A further sprocket wheel 71 is located at the other end of the guide 5 and a chain 72 passes round these sprocket wheels 70 and 71 and along the guide 5 (the upper surface 6 of the aeroplane being slotted to allow the sprocket wheels and chain to pass through). The two ends of this chain 72 are connected to the eye brackets 26 on the body 20 of the slidable carriage mounted in the guide 5. This carriage supports the rear end of the hood by means of its tapered plug 23 which engages in the socket 32 in the block 31 carried by the transverse bridge 12 which connects the two sides of the hood and forms a strong feature of the monocoque tail section of the hood. By operating the handle 60 the chain 72 will traverse the rear slidable carriage in the guide 5 and will cause the hood to be opened or closed according to the direction in which the handle 60 is turned. It will be seen that the winding gear for opening and closing the hood operates quite independently of the hood release mechanism and also that the hood may instantly be released whatever position it may occupy when the release lever is actuated. The hood forms a very strong and rigid structure and provides excellent vision all round the pilot or other occupant of the cockpit.

I claim:

1. In a hood for the cockpit of an aeroplane,

the combination of a streamlined transparent cover having a tapered rear section, a concave cover fixed to the bottom of said rear section, a slidable carriage supporting said first-mentioned cover at each side edge, another carriage centrally disposed under the concave cover of said rear section, all of said carriages being adapted to be mounted on guides fixed to the aeroplane, releasable coupling means for connecting said hood to said carriages and means connecting all of said coupling means for releasing them simultaneously.

2. In a hood for the cockpit of an aeroplane as recited in claim 1 in which the releasable coupling means comprises a tapered socket mounted on said hood, a tapered plug mounted on the slidable carriage which supports said transparent cover, a locking pin passing transversely through said socket and plug, a cable having one end connected to said locking pin, the other end of said cable being connected to said releasing means.

3. In a hood for the cockpit of an aeroplane as recited in claim 1 in which the releasing means comprises a single coupling plate, means connecting said coupling plate with said releasable coupling means, and a lever for reciprocating said coupling plate for releasing said coupling means.

4. In a hood for the cockpit of an aeroplane, the combination of a streamlined transparent cover having a tapered rear section, a concave cover fixed to the bottom of said rear section, a slidable carriage supporting said first-mentioned cover at each side edge, another carriage centrally disposed under the concave cover of said rear section, all of said carriages comprising rollers adapted to ride upon guides fixed to the aeroplane, a tapered plug mounted on each of said carriages, a corresponding tapered socket mounted on said hood, a locking pin passing transversely through each of said sockets and said tapered plugs, a cable attached to each of said pins, all of said cables being connected to a single coupling plate, a lever mounted on said central carriage and having one end connected to said coupling plate, an operating cable having one end attached to the other end of said lever, the other end of said operating cable being connected to an operating lever whereby reciprocation of said operating lever will simultaneously withdraw all of said locking pins and release said hood from said aeroplane.

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