Dec. 11, 1951 P. F. EVERITT ET AL 2,578,234

SEXTANT HATCH

Filed Oct. 4, 1949 2 SHEETS—SHEET 1

FIG. 1.

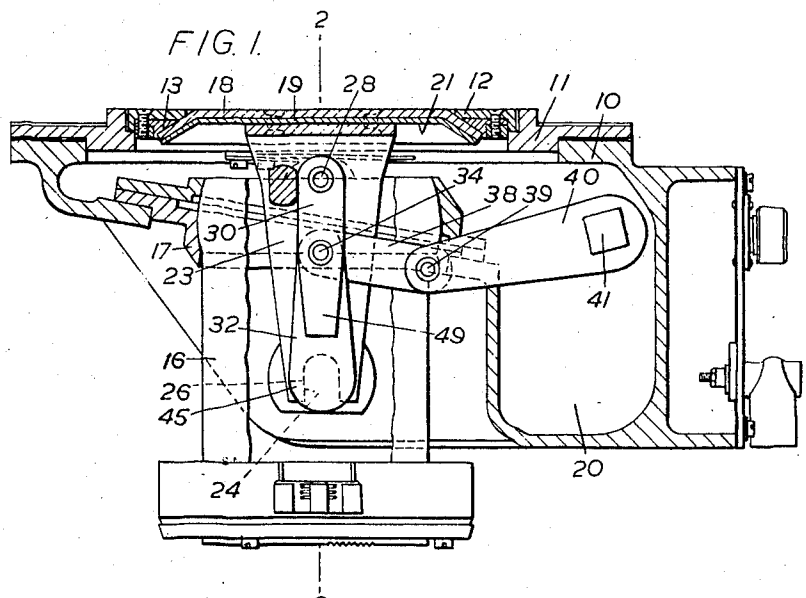
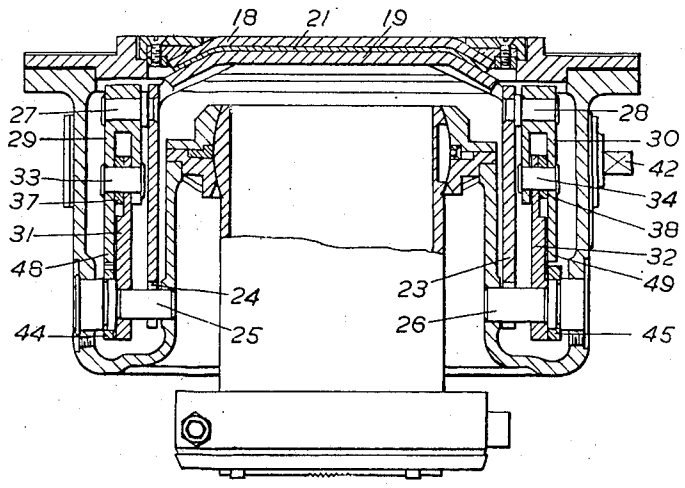


FIG. 2.



Inventors
PHILIP F. EVERITT &
GEORGE R. JAMIESON
By
Young, Quigg & Thompson
Attorneys

Dec. 11, 1951 P. F. EVERITT ET AL 2,578,234

SEXTANT HATCH

Filed Oct. 4, 1949 2 SHEETS—SHEET 2

FIG. 3.

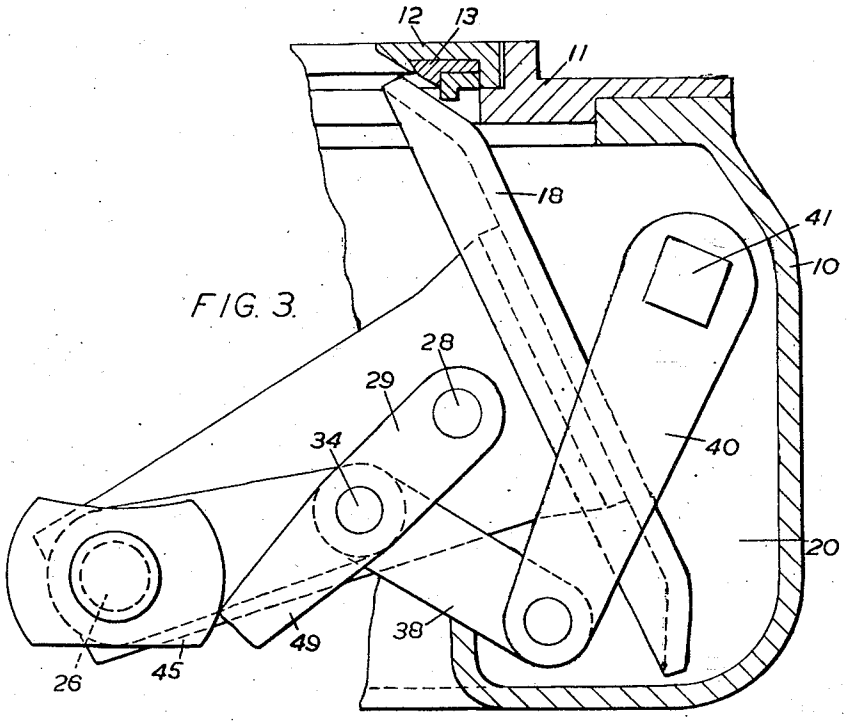
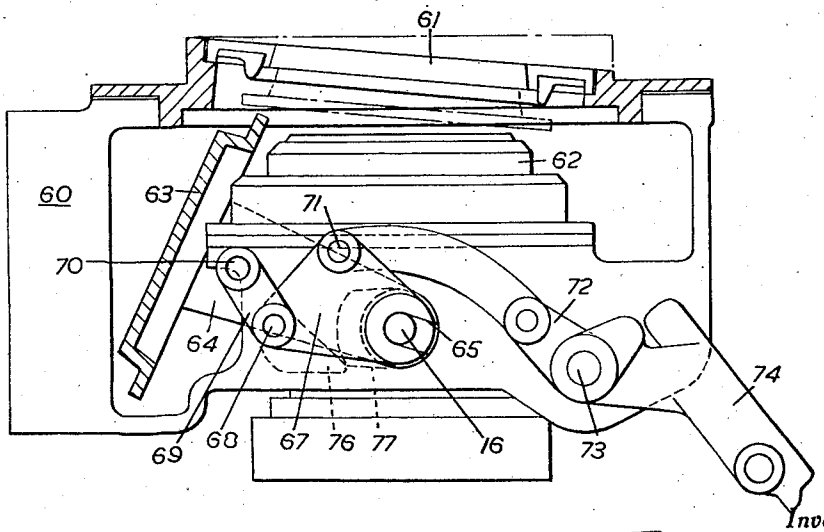


FIG. 4.



Inventors
PHILIP F. EVERITT &
GEORGE R. JAMIESON
By
Young, Kenney & Thompson
Attorneys

Patented Dec. 11, 1951

2,578,234

UNITED STATES PATENT OFFICE

2,578,234

SEXTANT HATCH

Philip Francis Everitt and George Robert Jamieson, Seven Kings, England, assignors, by mesne assignments, to Kelvin & Hughes Limited, a British company

Application October 4, 1949, Serial No. 119,495
In Great Britain October 5, 1948

4 Claims. (Cl. 20—16)

1

This invention relates to hatches through which sextants or other instruments can be pushed to project outside the pressurised aircraft and withdrawn without appreciable loss of air or air pressure.

For this purpose according to the present invention the hatch has a casing having an opening adapted to be closed by a hatch cover operated for opening by a movement which first maintains the cover parallel to its closed position until it is a short distance below the opening whereupon the cover is swung to one side downwards and outwards, the reverse movements taking place on closing. This method of opening and closing ensures a tight closure without undue wear of the cover and hatch rim surrounding the opening, and enables a hatch tube to be provided close under the opening to receive the periscopic tube of a sextant or other instrument.

The movements may be accomplished by a control lever operating means which includes a cam which serves to prevent straightening of a toggle for closing the cover until the latter has reached a position in which it requires motion.

A constructional form of the invention will now be described by way of example with reference to the accompanying diagrammatic drawings wherein:

Figure 1 is a vertical sectional view of a hatch made in accordance with the invention;

Figure 2 is a sectional view of the hatch on line 2—2 on Figure 1, showing the hatch closed;

Figure 3 is a view similar to Figure 1 showing certain parts in a different position with the hatch open and omitting other parts; and

Figure 4 is a view similar to Figure 1 but showing a modified construction.

In the form shown in Figures 1 to 3 a hatch housing 10 has a ring shaped top cover 11 to the inner periphery of which is fixed a ring 12 which carries a resilient packing ring 13. These rings form the opening through which the periscopic tube of a periscopic sextant can be projected, being guided and supported by a hatch tube 16 carried by the housing 10 by means of a bearing ring 17. The opening can be closed by means of a hatch cover 18 which can be opened by a short downwards motion so as to free itself easily from the rings 12, 13, and then by a motion outwards and downwards into a space 20 in the housing at one side of the tube 16, as shown in Figure 3. For this purpose the hatch cover 18 is riveted to a cross-plate 19 with the interposition of a stiffening plate 21. The cross-plate 19

2

is attached at opposite ends to a pair of downwardly extending lugs 22, 23, located on opposite sides of the hatch tube. The lower ends of these lugs are bifurcated at 24 and straddle pins 25, 26 carried by the housing. These lugs are connected by pivot pins 27, 28, to the upper levers 29, 30 of a pair of toggles, the lower levers 31, 32 of which are pivoted by pins 33, 34, to the levers 29, 30, and have their lower ends pivotally mounted on the pins 25, 26. Links 37, 38 have ends mounted on the pins 33, 34, and other ends pivotally connected at 39 to a two-armed member 40 fixed on pivot pins 41 one of which extends out of the housing where it has a squared end 42 which carries an operating lever (not shown).

The pins 25, 26, carry cam plates 44, 45, and the upper levers 29, 30, of the toggles are integrally extended to provide cam-contacting arms 48, 49.

A stop 50 carried by the housing limits the movement of the pivots 27, 28 around the pin 26.

When the pins 41 are rotated to open the hatch, the toggle is broken thereby pulling the hatch cover downward with the cover remaining substantially parallel to the rings 12, 13. Upon further rotation of the pins 41, the arms 48, 49, contact the cams 44, 45, so as to hold the toggles in relatively broken positions over the remainder of the movement into the fully open position shown in Figure 3. Similarly during rotation of the pins 41 to close the hatch, the arms 48, 49 ride on the cams over the main part of the movement thereby keeping the toggles broken until the hatch cover is directly located beneath the rings 12, 13, as determined by the stop 50 at which position the arms 48, 49 will have just moved clear of the cams whereupon further rotation of the pins 41 causes the toggles to be straightened thereby moving the hatch cover into closing position.

In the modification shown in Figure 4 a hatch casing 60 has an opening 61 and a tube 62 disposed beneath the opening. The opening 61 is adapted to be closed by a hatch cover 63 which has a bracket 64 having a fork 65 engaged on a pivot pin 66. A triangular link 67 is pivotally mounted on the pin 66 and is pivotally attached at 68 to a link 69. The links 67, 69 form a toggle. The link 69 is pivoted at 70 to the bracket 64. The link 67 is attached pivotally at 71 to a lever 72 which is moved about a pivot 73 by a suitable control lever 74 and appropriate connections. The link 69 has a nose piece 76 which trails on a cam 77 while the cover swings up to a posi-

tion about parallel to the opening 61 when the pivot 70 meets a stop and a further pull on the pivot 71 draws the pivot 18 towards the line connecting the pivots 66 and 70 or in other words straightens the toggle. The cam prevents straightening of the toggle before the pivot 20 reaches the stop. The nose then rides off the stop and is raised above the cam as the toggle is straightened.

The invention may be used in conjunction with the locking means described in a patent application of even date.

We claim:

1. A hatch having an opening, a hatch cover, fixed pivot means spaced from and disposed opposite said opening and having its axis positioned parallel to the plane of said opening, lugs extending perpendicularly from said cover and provided with longitudinally extending slots in their free ends for receiving said pivot means, a toggle linkage including a pair of pivotally connected links, the free end of one of said toggle links being pivotally mounted on said fixed pivot means, means pivotally connecting the free end of the other toggle link to said cover, actuating means connected to the toggle linkage operable in one direction when the closure is in position on said opening to break the toggle linkage and thereby move the closure away from the opening until the ends of the slots in the lugs engage the fixed pivot means and to then swing the closure about the pivot means and operable in the opposite direction to swing the closure about the fixed pivot means to a position opposite the opening and to close the toggle linkage to press the closure onto said opening, a fixed cam in the path of movement of a part of the toggle linkage to engage and retain the linkage broken until the closure is swung to a position opposite the opening, and stop means for preventing swinging movement of the closure past a position opposite the opening.

2. A hatch as claimed in claim 1 wherein one link of the toggle has an element fixed thereto which rides on the cam during swinging movement of the cover to keep the toggle broken, and rides off the cam to permit straightening of the cover for the final closing movement.

3. A hatch having an opening, a hatch cover, fixed pivot means spaced from and disposed opposite said opening and having its axis positioned parallel to the plane of said opening, lugs extending perpendicularly from said cover and provided with longitudinally extending slots in their free ends for receiving said pivot means, a toggle linkage including a pair of pivotally connected links, the free end of one of said toggle links being pivotally mounted on said fixed pivot means, means pivotally connecting the free end of the other toggle link to said cover, actuating means connected to the toggle linkage operable in one direction when the closure is in position

on said opening to break the toggle linkage and thereby move the closure away from the opening until the ends of the slots in the lugs engage the fixed pivot means and to then swing the closure about the pivot means and operable in the opposite direction to swing the closure about the fixed pivot means to a position opposite the opening and to close the toggle linkage to press the closure onto said opening, a fixed cam in the path of movement of a part of the toggle linkage to engage and retain the linkage broken until the closure is swung to a position opposite the opening, stop means for preventing swinging movement of the closure past a position opposite the opening, and a pivoted lever connected to said actuating means for shifting the same.

4. A hatch having an opening, a hatch cover, fixed pivot means spaced from and disposed opposite said opening and having its axis positioned parallel to the plane of said opening, lugs extending perpendicularly from said cover and provided with longitudinally extending slots in their free ends for receiving said pivot means, a toggle linkage including a pair of pivotally connected links, the free end of one of said toggle links being pivotally mounted on said fixed pivot means, means pivotally connecting the free end of the other toggle link to one of said lugs of said cover, a second toggle linkage similarly disposed and connected between said fixed pivot means and the other lug of said cover, actuating means connected to the toggle linkages operable in one direction when the closure is in position on said opening to break the toggle linkage and thereby move the closure away from the opening until the ends of the slots in the lugs engage the fixed pivot means and to then swing the closure about the pivot means and operable in the opposite direction to swing the closure about the fixed pivot means to a position opposite the opening and to close the toggle linkage to press the closure onto said opening, a fixed cam in the path of movement of a part of the toggle linkage to engage and retain the linkage broken until the closure is swung to a position opposite the opening, and stop means for preventing swinging movement of the closure past a position opposite the opening.

PHILIP FRANCIS EVERITT.
GEORGE ROBERT JAMIESON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
723,793	Wilcox	Mar. 24, 1903
1,737,301	Eirich et al.	Nov. 26, 1929
2,247,509	Labus	July 1, 1941
2,452,790	Pledger	Nov. 2, 1948