May 21, 1963 H. KUMMERMAN 3,090,429

FLAP COVER DEVICES FOR CLOSING OPEN SPACES SUCH AS SHIPHOLD HATCHWAYS, RAILWAY CARS, AND THE LIKE

Filed Oct. 20, 1960

3 Sheets-Sheet 1

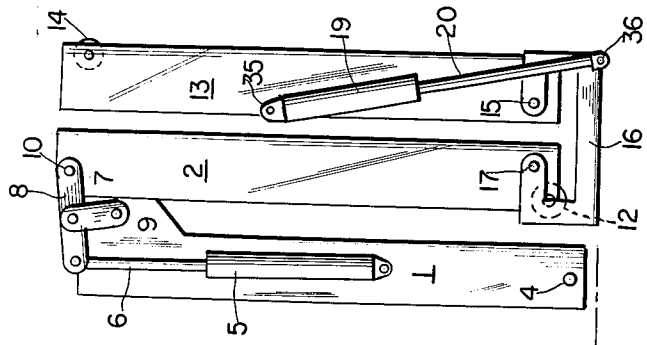


Fig 7

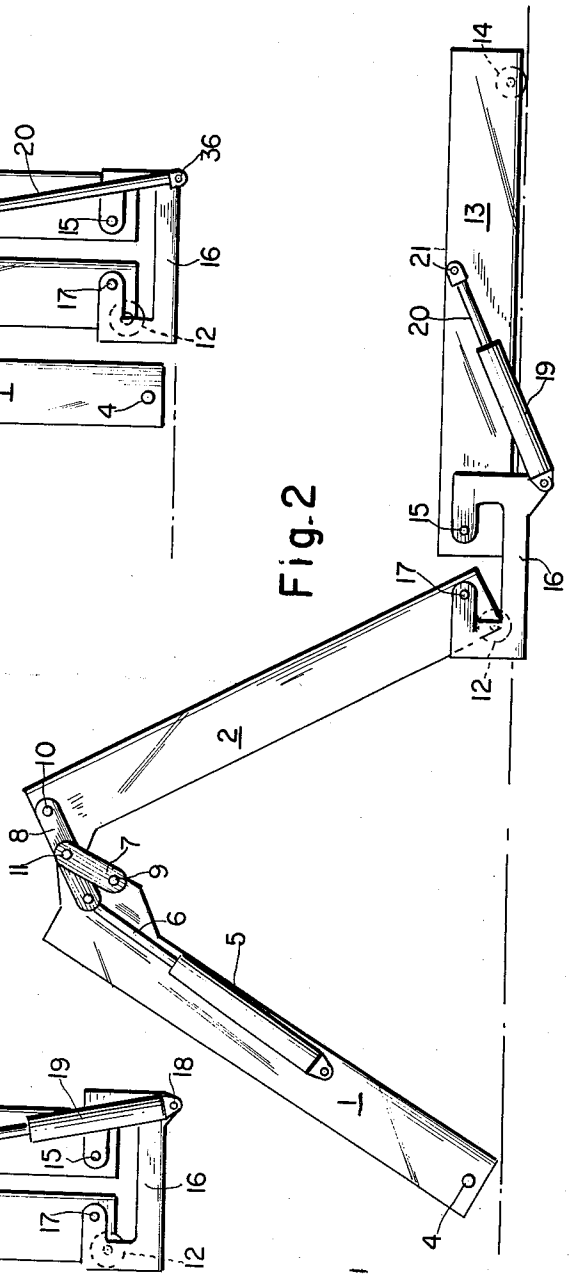


Fig.2

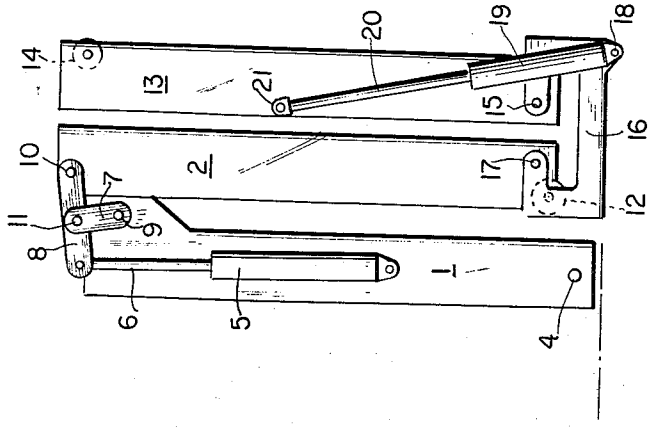


Fig.1

INVENTOR
HENRI KUMMERMAN
BY
Kenyon & Kenyon
ATTORNEYS

May 21, 1963 H. KUMMERMAN 3,090,429

FLAP COVER DEVICES FOR CLOSING OPEN SPACES SUCH AS SHIPHOLD HATCHWAYS, RAILWAY CARS, AND THE LIKE

Filed Oct. 20, 1960 3 Sheets-Sheet 2

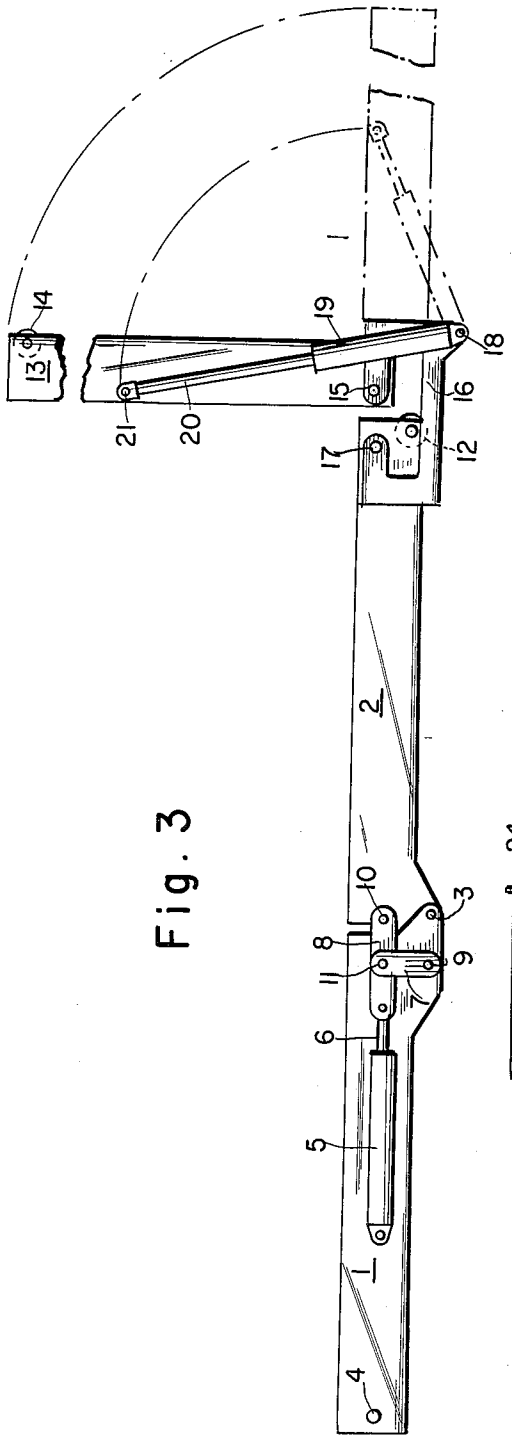


Fig. 3

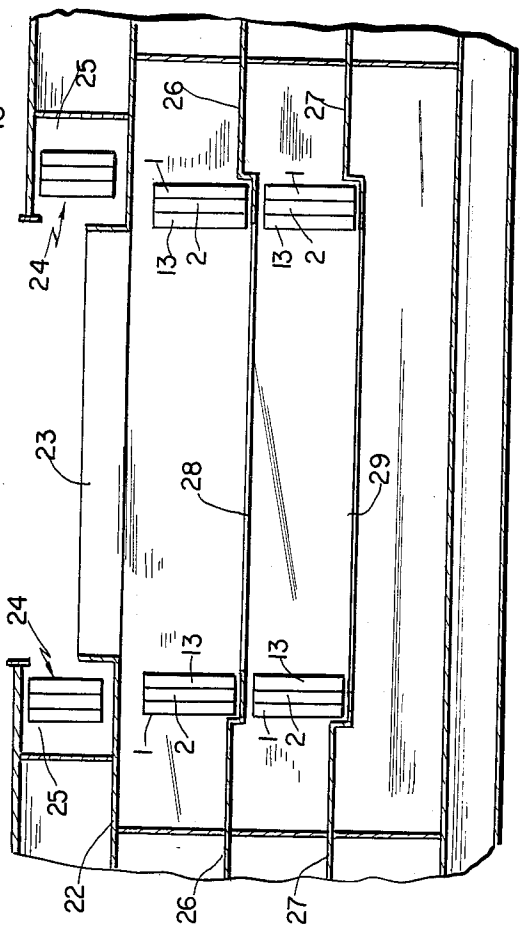


Fig. 4

INVENTOR
HENRI KUMMERMAN
BY Kenyon & Kenyon
ATTORNEYS

May 21, 1963 H. KUMMERMAN 3,090,429

FLAP COVER DEVICES FOR CLOSING OPEN SPACES SUCH AS SHIPHOLD HATCHWAYS, RAILWAY CARS, AND THE LIKE

Filed Oct. 20, 1960

3 Sheets-Sheet 3

Fig. 5

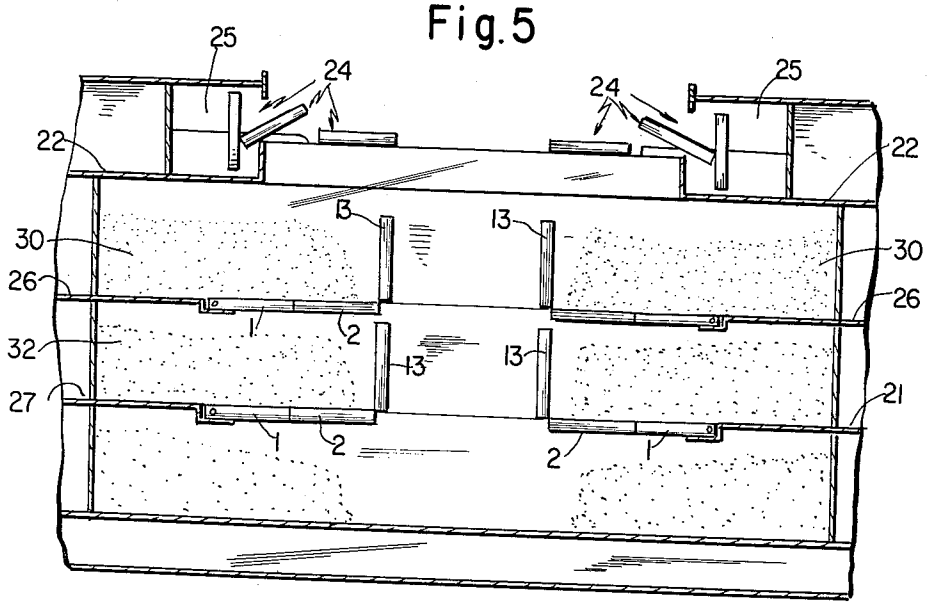
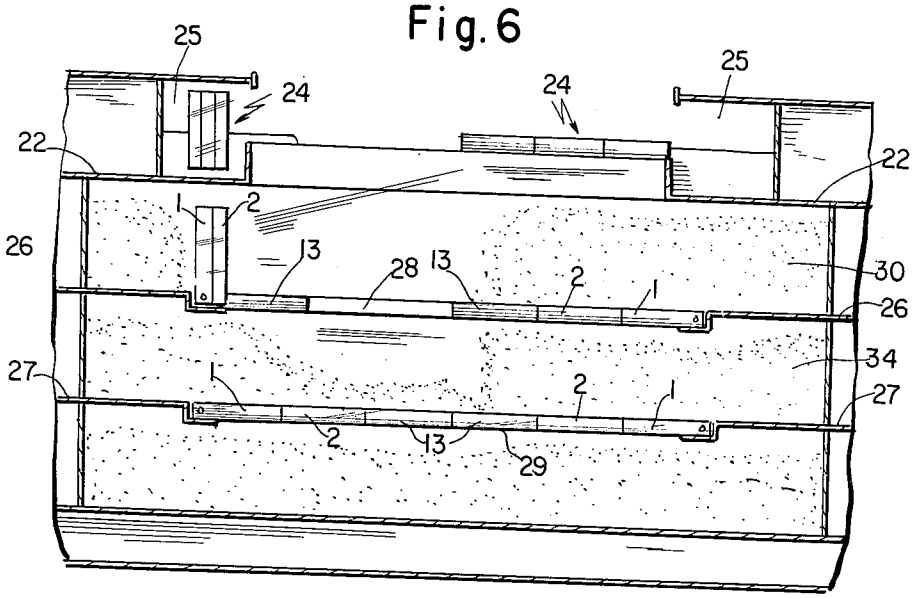



Fig. 6




INVENTOR
HENRI KUMMERMAN
BY
Kenyon & Kenyon
ATTORNEYS

United States Patent Office 3,090,429
Patented May 21, 1963



3,090,429

# FLAP COVER DEVICES FOR CLOSING OPEN SPACES SUCH AS SHIPHOLD HATCHWAYS, RAILWAY CARS, AND THE LIKE

Henri Kummerman, Paris, France, assignor to International MacGregor Organization (I.M.G.O.), a body corporate of Monaco

Filed Oct. 20, 1960, Ser. No. 63,754
Claims priority, application France Oct. 24, 1959
5 Claims. (Cl. 160—188)

The present invention is concerned with devices for closing open spaces such as the hatchways of shipholds, railway waggons, etc. of the type utilizing hingedly interconnected flap cover elements or panels, wherein the first element or panel is also hingedly mounted on the edge of the space to be closed, these elements or panels being adapted either to close the space associated therewith by bearing horizontally on the edges of this space, or to open same by being folded back in an accordion-like manner.

Panels of this general character are already known, which are operated to and from their closed position either automatically or by means of chains or cables wound on winches. As a rule, these panels are mounted by pairs and in the case of fully automatic operation each pair is provided with a separate control system for example in the form of a fluid-actuated cylinder.

It is the scope of this invention to provide improvements in or relating to panel devices of this general character. The device according to this invention is remarkable notably in that it comprises at least one additional panel connected to the free end of the last panel in the row of hingedly mounted panels, and provided with one or more independent and self-acting control means whereby said additional panel can rotate through an angle of about 90° and brought at will to a substantially vertical or horizontal position in which it constitutes the continuation of said row.

According to another feature of this invention, the aforesaid two hinges or connections of said last-mentioned panel and of said additional panel are located in such relationship to each other that said additional panel can accomplish freely the angular movements inherent thereto.

According to another feature characterizing this invention, said additional panel is hingedly mounted on one or more intermediate members on which the free end of the last panel in the row of panels is also pivotally mounted.

Furthermore, in the arrangement of this invention, the fluid-actuated cylinder or other control means is pivotally mounted on said intermediate member or on said panel, whereas its rod is pivoted on said additional panel or on said intermediate member.

From the foregoing it will be readily understood that with the device constituting the subject-matter of this invention, it is possible to provide a flap cover assembly having a flexibility considerably greater than in any existing hatch-cover and like system. Thus, if for example the "sheet" consisting of the panels hingedly interconnected is closed, it is possible, by acting upon the separate control means associated with the additional panel to open the hold only partially. Similarly, it is possible, by disposing this panel in a substantially vertical position, to provide a kind of breast-work or vertical wall and thus store goods on the row of panels left in their substantially horizontal position. Conversely, the panels constituting the row of hinged panels may be raised while leaving the additional panel in its substantially horizontal position in order to create not a breast-work but a platform permitting the circulation of goods and/or members of the crew along the hatch-coaming or the edge of the railway waggon.



Other features of this invention will appear from the description of a few typical forms of embodiment thereof which is made hereafter with reference to the accompanying diagrammatic drawings forming part of this invention and wherein:

FIGURE 1 shows in diagrammatic elevational view a flap cover device according to this invention in its open condition;

FIGURE 2 is a view similar to FIGURE 1 but showing the additional panel in its substantially horizontal position and the hingedly interconnected panels during their folding movement;

FIGURE 3 is another view similar to FIGURE 1 showing the hingedly mounted panels in their horizontal position and the additional panel in its vertical position;

FIGURES 4, 5 and 6 show various modes of utilizing the panels according to this invention, and

FIGURE 7 illustrates a modified embodiment.

In the form of embodiment illustrated in the drawings the flap cover device of this invention comprises two elements or panels **1**, **2** hingedly interconnected about an axis **3** (see FIG. 3). Moreover, the element **1** is hingedly mounted at **4** about an axis pertaining to the space to be covered, in this case a hatchway to be closed. In the example illustrated, it is assumed that the flap cover elements or panels are adapted to be operated automatically by means of a fluid-actuated cylinder **5** acting through its rod **6** upon a pair of links **7**, **8**, these links being pivoted the one **7** at **9** on the panel **1** and the other **8** at **10** on the panel **2** and at **11** on the link **7**. This type of control system for hingedly interconnected panels is known from applicant's co-pending application, Serial No. 708,834, filed January 14, 1958, for "Control Device for Doors or Panels, Notably for Closing Open Spaces and the Like."

The panel **2** carries on its free end a roller **12** or, more exactly, a pair of rollers whereby it can roll on the two side edges of the space to be closed. Of course, if relatively wide panels are used, two control cylinders **5** (or even a greater number thereof, according to the panel width) should be provided at suitably spaced intervals across the panel.

An additional panel **13** is mounted after the set of panels consisting of the elements **1** and **2**. This additional panel carries rollers **14** on its free end and is pivoted at **15** on an intermediate member **16**. This member **16** has substantially the shape of a U and the hinge axis **15** lies on one of its arms, as shown. The other arm of the member **16** is pivoted at **17** on the free end of the aforesaid panel **2** which is the last panel in the row of hingedly interconnected panels **1** and **2**.

Pivoted at a point **18** lying on the intermediate member **16** is the fluid-actuated cylinder **19** having its rod **20** pivotally connected at **21** to the additional panel **13**.

The operation of the device described hereinabove is very simple.

Assuming firstly that the panels are in their open position, that is, in the position shown in FIGURE 1, it will be seen that the two panels **1** and **2** are responsive to the actuation of cylinder **5**, whereas the panel **13** is raised by actuating the cylinder **19**. To close completely the open space on which the flap cover system of this invention is mounted, the operator may firstly move the panel **13** to its horizontal position by actuating the cylinder **19**, as illustrated in dotted lines in FIGURE 3, whereafter the cylinder **3** will move the pair of panels **1**, **2** to their horizontal position as shown in this FIGURE 3, while pushing the panel **13** which can roll along the edges of the space to be closed.

If desired, the additional panel **13** may also be maintained in the vertical position and the cylinder **5** may be actuated only to the extent necessary for attaining the position shown in thick lines in FIGURE 3.

FIGURE 2 shows an intermediate position between the open and closed positions of the open space.

In the case illustrated in FIGURE 7 the cylinder **19** is pivotally mounted at **35** on the panel **13** and its rod **20** is pivoted at **36** on the member **16**.

In FIGURES 4, 5 and 6, various examples of panels constructed according to the teachings of this invention and mounted on board a ship are illustrated. It is assumed that the ship comprises a main deck **22** having a hatchway **23** closed by flap cover elements **24**. These elements may be of same character as those constituting the subject-matter of this invention, or of different type.

In the example illustrated, panels adapted to be concealed in a stowage space **25**, and known to specialists under the name of "Single Pull" covers, are used.

It is assumed that the ship comprises two 'tweendecks **26**, **27** each provided with hatchways **28**, **29**. These 'tweendecks are closed by a flap cover system constructed according to the teachings of this invention.

In FIGURE 4, the elements or panels of the flap cover system are shown in their open position.

In FIGURE 5 it is assumed that the hatchway was partially open to permit the access to the upper compartment in spite of the presence of cargo **30**, **31** on the panels **1** and **2**. In this case, the arrangement shown in FIGURE 3 is resorted to, which consists in maintaining the two panels **1**, **2** closed and disposing the additional panel **13** vertically.

In FIGURE 6 is is assumed that the cargo **33** stored on the 'tweendeck **26** cannot be moved (see right-hand side of the figure), but that on the other hand the panels on the left-hand side can be moved, the cargo **32** being somewhat spaced therefrom. In this case, the two panels **1**, **2** are raised on the left-hand side and the panel **13** is left in its horizontal position. Thus, the 'tweendeck **27** can be reached through a sufficient aperture.

On the 'tweendeck **27** the hatchway **29** is closed completely by unfolding two groups of panels **1**, **2** and **13** to permit the storage of cargo thereon as shown at **34**.

Of course, the number of panels or elements constituting each flap cover system or row of hingedly interconnected elements is not critical.

The choice of two panels in the examples described and illustrated herein is made only with a view to simplify the disclosure and drawings.

Of course, the invention should not be construed as being limited to the few forms of embodiment shown and described herein, as many modifications may be brought thereto without departing from the spirit and scope of the invention as set forth in the appended claims.

What I claim is:

1. A remote controlled closure device for horizontal top openings in stationary and travelling open-top enclosed spaces such as hatchways in ship decks, roof apertures in buildings and in rolling vehicles, each opening being closed by at least one cover panel comprising an even number of hingedly interconnected panel sections forming a row of which that extreme panel section which is adjacent an end edge of said opening is pivotally connected to said end edge and at least the opposite extreme panel section is provided with side wheels at its free end for continuous bearing and rolling engagement with the lateral edges of said opening, said panel sections being adapted to close said opening by extending horizontally thereover and resting on said lateral edges thereof and to open same by being folded accordionwise in vertical parallel relationship to each other upon moving towards said end edge, at least one additional panel section forming a tilting flap cover element which is in pivotal



connection with the free end of said opposite extreme panel section of said row, said pivotal connection remaining in the vicinity of the plane of said opening and consisting of at least one pair of slide-rest forming intermediate link members pivotally connected each one at two separate points thereof and in substantially sidewise relation respectively to said flap cover element at the adjacent end thereof and to said free end of said opposite extreme panel section adjacent to said flap cover element, each said intermediate link member being adapted on the one hand to move along and in bearing engagement with the corresponding edge of said opening while keeping a fixed orientation and on the other hand to alone support said flap cover element in the raised position thereof relative to said opening, lateral roller means provided on the free end of said flap cover element for rolling engagement with the edges of said opening when said element is in its substantially lowered horizontal position, at least one independently controlled power actuator means carried by one of said intermediate link members and operatively connected to said flap cover element for rotating the latter independently of said row through an angle of about 90° about its pivotal mount to swing it from a substantially vertically raised position to a horizontal position in continuation of said row and vice versa.

2. A device according to claim 1 wherein said power actuator means consists of a ram-forming jack fulcrumed on said one intermediate link member and provided with an operating reciprocable plunger rod pivotally attached by its end to said flap cover element.

3. A device according to claim 1 wherein each said intermediate link member is U-shaped, being formed with two upstanding arms provided at their upper ends with inward projecting lugs to which said flap cover element and said opposite extreme panel section adjacent thereto are hingedly connected respectively.

4. A device according to claim 1 wherein common means are provided for operating said panel sections for horizontal positioning and for accordion-wise folding, wherein each said intermediate link member has general U-shape and is formed with two vertical arms, one of said two arms being pivotally connected to said free end of said opposite extreme panel section adjacent to said flap cover element, the second of said two arms being pivotally connected to said flap cover element and wherein said power actuator consists of independently operable jack means connected to said intermediate link members and to said flap cover element to effect said pivotal movement of the latter.

5. A device according to claim 4 wherein said arms are provided laterally of each said intermediate link member and are oppositely directed to each other and said jack means includes a control rod, said jack means being pivotally connected to one said intermediate link member, and said control rod being pivotally connected to said flap cover element to effect said pivotal movement thereof upon energizing of said jack means.


**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 681,624 | Cowles | Aug. 27, 1901 |
| 2,136,012 | Jones | Nov. 8, 1938 |
| 2,540,995 | Roeder | Feb. 6, 1951 |
| 2,770,297 | Mercier et al. | Nov. 13, 1956 |
| 2,893,484 | Gordon | July 7, 1959 |

FOREIGN PATENTS

| | | |
|---|---|---|
| 168,626 | Sweden | Sept. 15, 1959 |