June 26, 1962 F. G. STEWART ET AL 3,041,099

LOCKING MEANS FOR CAR ROOF HATCH COVERS

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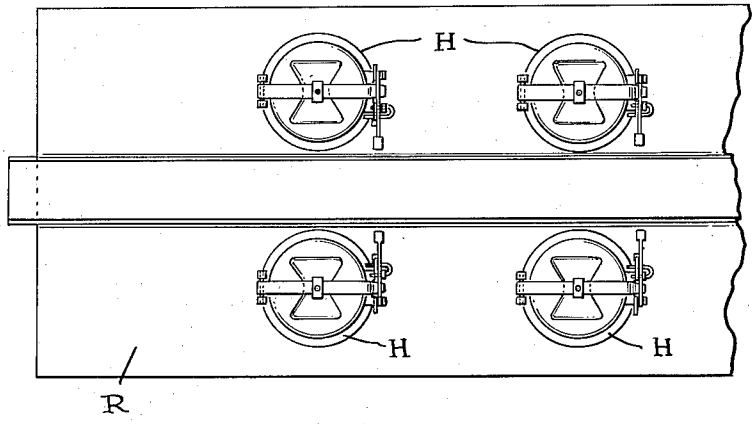


FIG. 1.

FIG. 2.

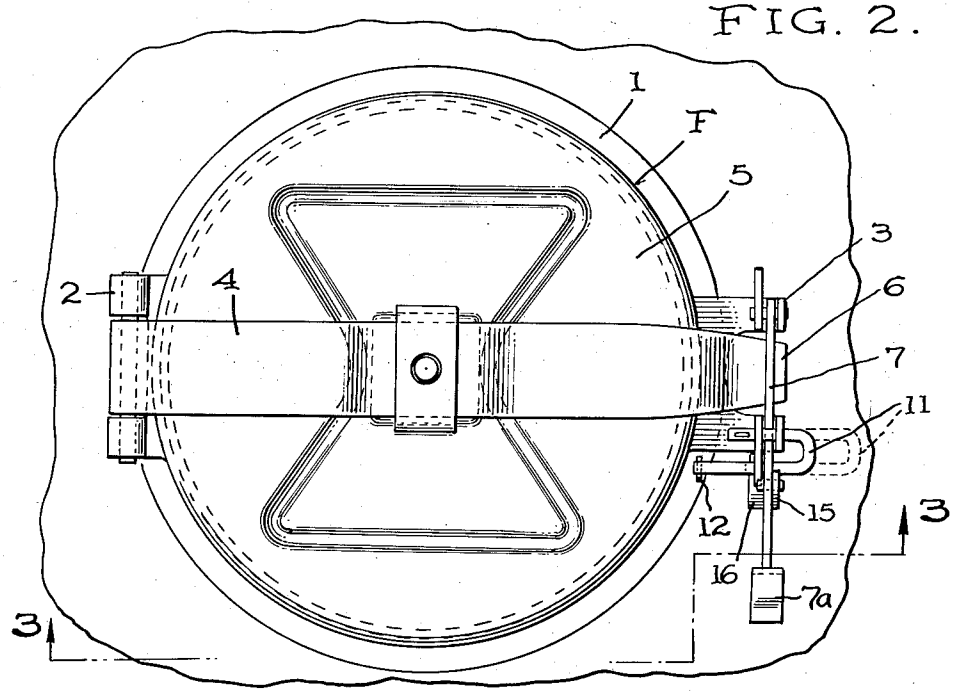
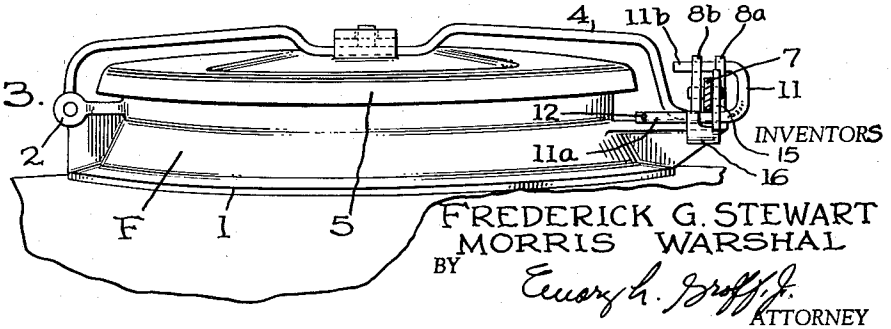


FIG. 3.



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FIG. 4.

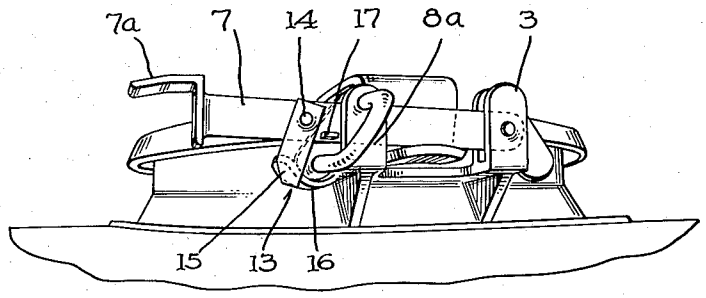


FIG. 5.

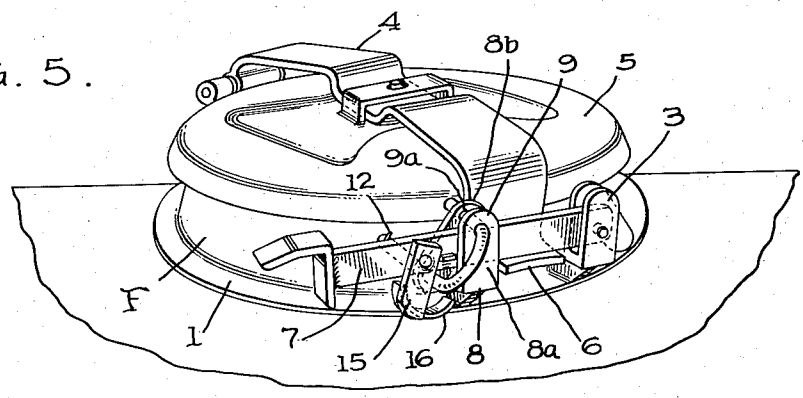
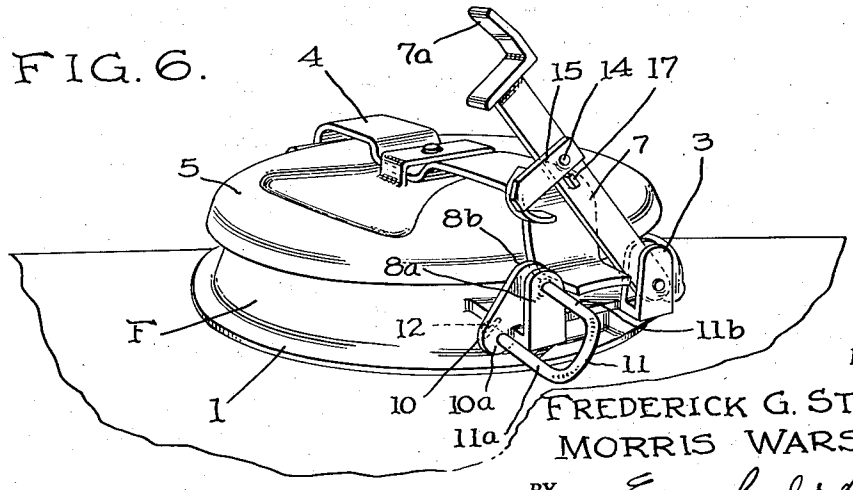


FIG. 6.



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LOCKING MEANS FOR CAR ROOF HATCH COVERS

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This invention relates to means for locking car roof hatch covers.

One object of the invention is to provide a two-stage locking arrangement for hatch covers for added security and safety of operation.

A more specific object of the invention is to prevent a sudden and uncontrolled opening of the hatch cover upon release of the primary locking means.

Another object of the invention is to provide secondary locking means which also serves as a safety catch device and automatically is self-positioning during the locking of the hatch cover.

Other objects and advantages of the invention will become apparent in the course of the following detailed description, taken in connection with the accompanying drawings, wherein:

FIGURE 1 is a top plan view partly broken away showing the roof of a railway car with a plurality of hatch covers installed therein.

FIGURE 2 is a top plan view on an enlarged scale of one of the hatch covers shown in FIGURE 1.

FIGURE 3 is a side elevation taken on line 3—3 of FIGURE 2.

FIGURE 4 is a perspective view showing the safety catch in its operative position after initial release of the latch bar.

FIGURE 5 is a perspective view showing the hatch cover in its closed position with the latch bar depressed and the safety catch in inoperative position.

FIGURE 6 is a perspective view showing the latch bar released so as to permit opening of the hatch cover.

Referring to FIGURE 1 of the drawings, R designates a railway car roof having a plurality of hatches H therein.

The hatches and the related locking mechanism are all similar in construction, hence only one of them will be described. Each hatch comprises a frame F designed to fit around an opening in the car roof R as shown in FIGURES 1, 2 and 3. The frame F includes an annular flange **1** having hinge butts **2** and **3** located on opposite sides thereof. A resilient strap **4** is pivotally mounted at one of its ends in the hinge butts **2** and is secured substantially medially thereof to the top surface of a hatch cover **5**. The free end of the strap **4** is bent downwardly and outwardly to form a tongue **6** which is disposed adjacent the hinge butts **3** when the cover is in closed position.

Referring particularly to FIGURES 4, 5, and 6, a latch bar or lever **7** is provided with a handle **7***a* at one end and at its opposite end is pivotally mounted in the hinge butts **3**. When cover **5** is to be locked in a closed position, lever **7** is moved downwardly across tongue **6** into a bifurcated keeper member **8** on frame F. The keeper member **8** includes a pair of parallel, spaced apart, vertically disposed arms **8***a* and **8***b*, both of which are provided with aligned openings, **9**, **9***a* in their upper portions. The lower portion of arm **8***b* is provided with a projection or toe **10** having an opening **10***a* therein. A bolt **11** of substantially "J-shape" has its longer leg **11***a* slidably fitted within the opening **10***a* and is prevented from being completely removed therefrom by means of a cotter pin **12**. The shorter leg **11***b* of bolt **11** is adapted

to pass through the openings **9**, **9***a* in arms **8***a* and **8***b* to lock the lever **7** when it is in its downward or closed position.

The construction thus far described is sufficient to initially lock the hatch cover in position and serves as the primary locking means. Nevertheless, in actual practice when the leg **11***b* of bolt **11** is removed from its locked position in arm **8***b*, the lever **7** and cover **5** have a tendency to swing upwardly with considerable momentum, thus creating a hazard which might result in injury to the workman or possible damage to the car roof. This sudden acceleration of the hatch cover and lever is due to large deflections and built up potential energy in the hatch lock components, particularly when the latter are made of aluminum alloys, although a somewhat similar condition may also occur when other materials such as steel or plastics are used.

In order to overcome this problem a secondary locking means in the form of a safety catch **13** is pivotally secured at its upper end to the lever **7** by means of a pin **14**. The catch **13** comprises a shank **15** having a hook **16** at its lower or free end. The tendency of the catch to swing counterclockwise as when bar **7** is being elevated or lowered is limited by means of a stop or lug **17** secured to the side of the lever **7** adjacent the shank **15** of the safety catch. Thus the catch **13** is so disposed that it is self-positioning in the locking cycle as will hereinafter appear.

When it is desired to lock the hatch cover in closed position, said cover is moved downwardly over the hatch opening so that the tongue **6** of strap **4** lies between the hinge butt **3** and the keeper **8**. With the bolt **11** in its outward position as shown in dotted lines in FIGURE 2, the lever **7** is moved downwardly into engagement with tongue **6** of strap **4**. As the lever **7** is depressed against the spring resistance of the strap **4** the hook **16** of safety catch **13** is held in position by lug **17** so that it will engage and slide down the inclined surface of member **8***b* until it passes the toe **10** thereof at which point it will swing by gravity in a counter-clockwise direction to a position beneath and slightly spaced from the toe **10**. The bolt **11** is then moved inwardly so that the short leg **11***b* thereof will bridge the space between members **8***a* and **8***b* and, by bearing against the upper edge of lever **7**, will retain it in its downward locked position.

When it is desired to unlock the hatch cover the workman drives the bolt **11** outwardly with a maul or hammer so that the leg **11***b* of the bolt will be moved away from the upper edge of lever **7**. Due to the inherent resiliency of the strap **4**, the built up energy therein as well as in the lever **7**, will cause both to have a tendency to spring upwardly when the bolt **11** is removed. However, such upward movement will be restricted when hook **16** of the safety catch **13** grips the protruding toe portion **10** of member **8***b*. Thus, the initial stored up energy in the hatch lock components is substantially dissipated, thereby eliminating the hazards previously mentioned. By the operator pressing downwardly on the handle **7***a* of the lever **7** with one hand and moving the safety catch **13** in a clockwise direction with his other hand, the lever **7** may be safely moved away from tongue **6** so that the hatch cover **5** may be opened.

While we have disclosed our invention in accordance with certain specific structural embodiments thereof, such is to be considered as illustrative only, and not restrictive, the scope of the invention being defined in the appended claims.

We claim:

1. A hatch construction comprising in combination a frame having an opening therein, a cover for closing said opening, a strap pivotally mounted at one end on

said frame and secured to said cover substantially medially thereof, the free end of said strap forming a tongue, a lever pivotally mounted on said frame and engageable with said tongue, keeper means mounted on said frame to receive said lever, said keeper means comprising a pair of spaced apart vertically disposed arms, each of said arms having an aligned opening adjacent its top edge, a toe portion extending downwardly and outwardly from one of said arms and having an opening therein, lever engaging means associated with said keeper means to retain said lever in locked position against said tongue, said lever engaging means comprising a bolt having a long leg, a short leg and a web portion therebetween, the legs of said bolt slidably disposed in said keeper means, safety catch means pivotally secured to said lever and engageable with said keeper means to prevent sudden acceleration of said lever and said hatch cover upon the unlocking of said lever, said safety catch means comprising a shank, a hook at the lower end of the shank, and stop means carried by said lever and cooperating with said safety catch means to restrict movement of said safety catch means when the latter is in disengaged position.

2. A hatch construction as defined in claim 1 wherein said stop means comprises a lug extending outwardly from said lever adjacent the shank of said safety catch means to limit counterclockwise movement thereof.

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