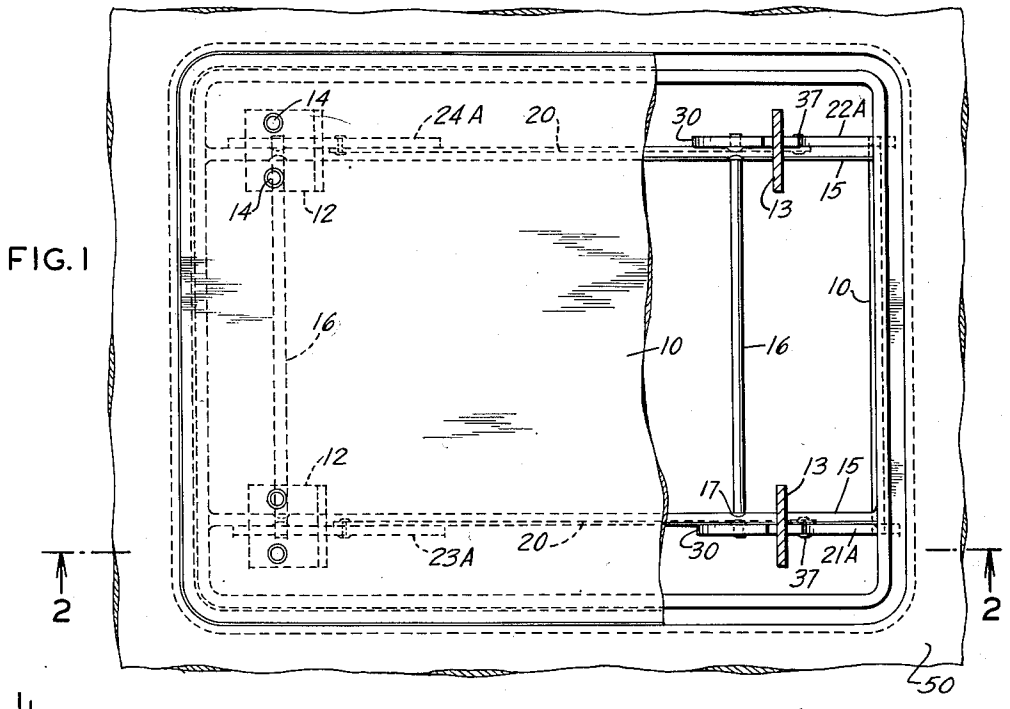
March 10, 1953 C. T. DENKER ET AL 2,631,032

EMERGENCY ESCAPE HATCH

Filed Oct. 16, 1951 2 SHEETS—SHEET 1

FIG. 1



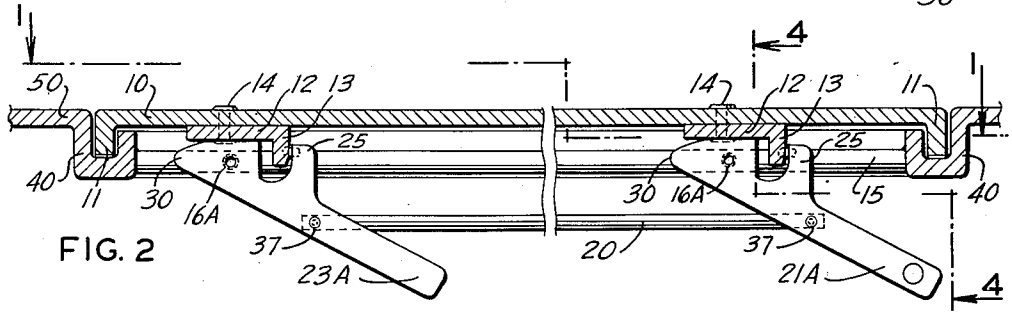




FIG. 2

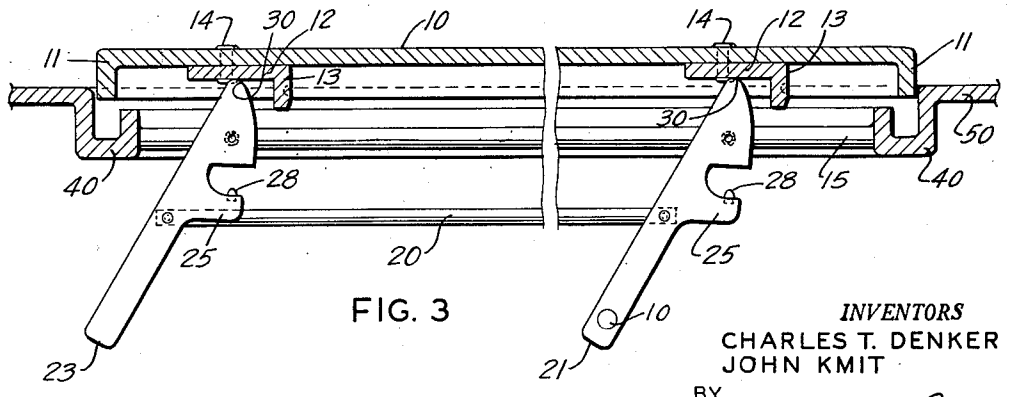



FIG. 3

*INVENTORS*
CHARLES T. DENKER
JOHN KMIT

BY Wallace and Cannon

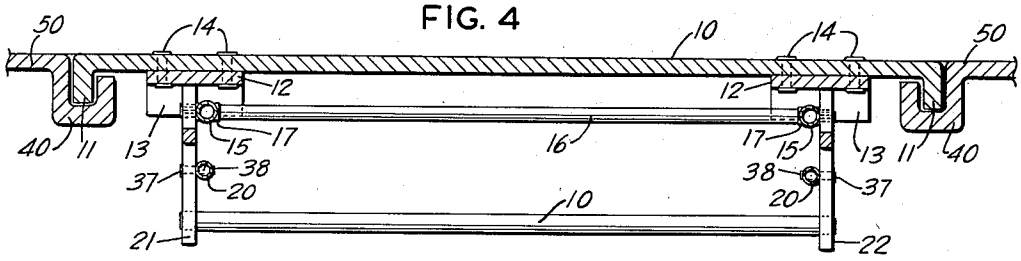
ATTORNEYS

March 10, 1953 C. T. DENKER ET AL 2,631,032

EMERGENCY ESCAPE HATCH

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FIG. 4



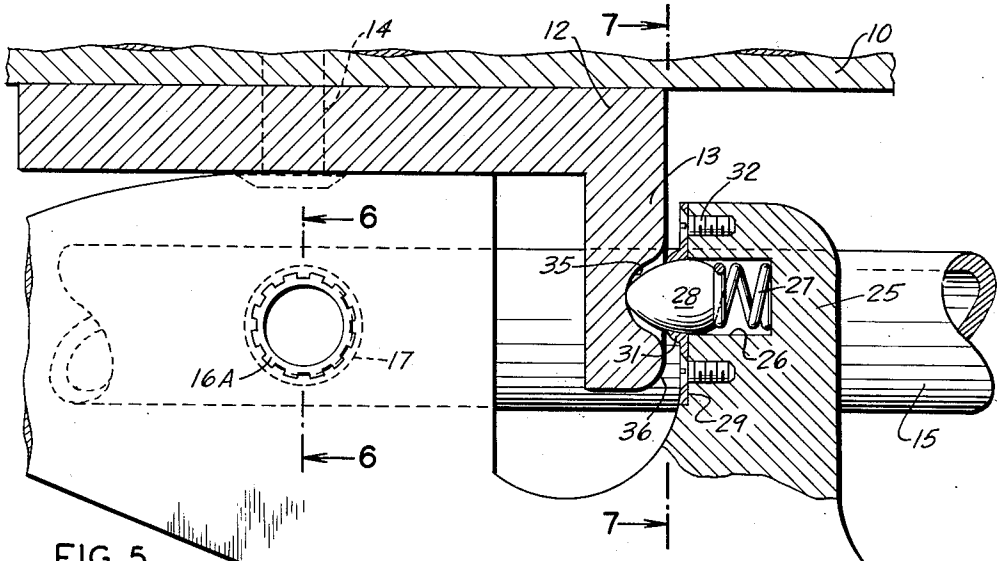




FIG. 5

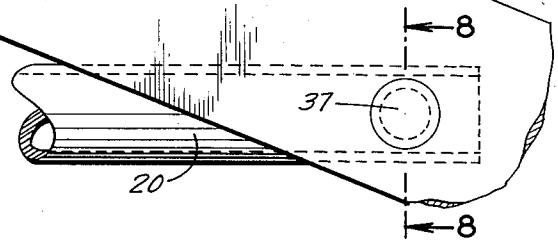
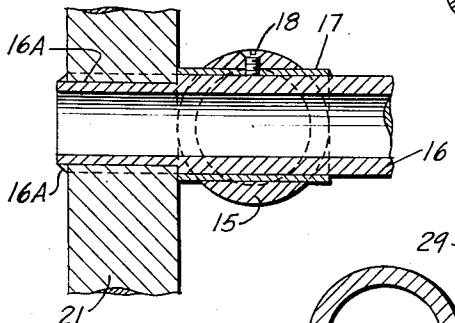



FIG. 6



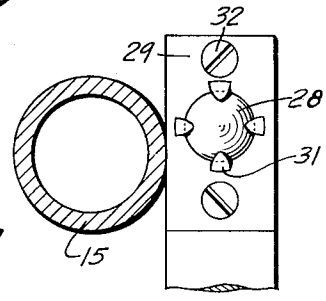




FIG. 7

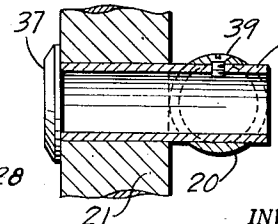



FIG. 8

INVENTORS
CHARLES T. DENKER
JOHN KMIT

BY Wallace and Cannon

ATTORNEYS

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# UNITED STATES PATENT OFFICE

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## EMERGENCY ESCAPE HATCH

Charles T. Denker and John Kmit, Chicago, Ill.

Application October 16, 1951, Serial No. 251,596

8 Claims. (Cl. 268—72)

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This invention relates to emergency escape hatches for automotive vehicles, airplanes, boats, and the like conveyances.

In emergency situations it sometimes becomes essential that an auxiliary means of escape from the conveyance be available, particularly where the normal means of egress are remote from the cab or otherwise impractical of utilization under the circumstances. It is therefore an object of the invention to provide a novel escape hatch that can be conveniently located for instantaneous use in a conveyance. It is a further object of this invention to afford an arrangement of parts whereby the closure panel of the escape hatch can be instantly sprung at all points of connection to the cab of the conveyance by a single movement only.

In some emergency situations, circumstances permit escape through restricted areas only and it becomes essential to have a hatch or closure panel which can be shifted or moved bodily, rather than swung about a hinge, from sealing position relative to the escape opening. Yet a further object of this invention is to afford means whereby this may be accomplished.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings which, by way of illustration, show a preferred embodiment of the present invention and the principles thereof and what we now consider to be the best mode in which we have contemplated applying those principles. Other embodiments of the invention utilizing the same or equivalent principles may be used, and structural changes may be made as desired by those skilled in the art without departing from the scope of the present invention.

In the drawings:

Fig. 1 is a top plan view of the escape hatch of the present invention mounted in the top of a conveyance, and showing a portion of the closure panel broken away to expose certain underlying parts;

Fig. 2 is a sectional view taken substantially along the line 2—2 of Fig. 1;

Fig. 3 is a sectional view similar to Fig. 2 but showing the respective parts in a different position;

Fig. 4 is a sectional view taken substantially along the line 4—4 of Fig. 2;

Fig. 5 is a view, on an enlarged scale, of one of the actuating handles and latching means shown in Fig. 2; and

Figs. 6, 7 and 8 are detail sectional views taken

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substantially along the lines 6—6, 7—7, and 8—8 of Fig. 5.

The escape hatch of the present invention as illustrated in Figs. 1 through 8 comprises a rectangular hatch or closure panel 10 having an area substantially equal to that of the escape opening provided in the cab of the conveyance. The closure panel 10 is adapted to overlie the escape opening in sealing relation thereto, and to this end the escape opening is conveniently bordered by a continuous channel member 40, panel 10 being provided with a complementary configured and integral flange member 11 adapted to make a snug fit with the channel member. If desired, the channel may be lined with a gasket or like sealing means, and while we have shown the escape hatch as being located in the top 50 of the cab, it will be appreciated that any other convenient location may be chosen.

Attached to the underside of closure panel 10 and adjacent the four corners thereof, are four plates 12 each secured in position by retaining means such as rivets 14. Each of the plates 12 has an integral and depending lug or abutment element 13, and these lugs function to releasably seat latching means for holding the closure panel 10 in sealing position over the escape opening as will be described in more detail below.

Within the area of the escape opening and extending longitudinally with respect to the opposite sides thereof, are a pair of mounting bars 15. The mounting bars 15 are secured in position to the opposite end sections of channel member 40, preferably by welding, and thus become a part of the cab to function as fixed supports for mounting interconnected actuating handles. These handles are paired off longitudinally as well as transversely relative to the escape hatch as will be pointed out below.

As best shown in Fig. 6, each of the mounting bars 15 is provided with a pair of transversely extending apertures that mount bushings as 17. The bushings are secured in position relative to the mounting bars as by set screws 18. Mounted for rotation in the bushings 17 are a pair of transverse shafts 16 having splined ends at 16A to which are keyed four actuating handles, 21 and 22, and 23 and 24, each handle corresponding to a respective one of the lugs 13 and provided with a grip portion as 21A. Thus, since the shafts 16 are free to rotate in the bushings 17, rocking or shifting movement imparted to one of the handles, as for instance 21, will be transmitted to the corresponding transversely positioned handle as 22, and conversely.

In order that all four handles will be actuated concomitantly with positive movement imparted to any one, rigid links 20 interconnect each longitudinal pair. Thus, each of the handles as 21 and 23 is journaled on a pivot pin, in the form of a short hollow sleeve as 38, extended through apertures in the handles and connected to opposite ends of the links 20 as by means of screws 39. As shown in Fig. 8, the pivot pins 38 are retained against displacement relative to the handle by means of integral heads 37. In this manner, each of the handles is freely rotatable in position on a corresponding pin 33, and all four handles may be instantaneously and simultaneously shifted or rocked from one position to another through such rotation as will be clear from the showing in Figs. 2 and 3.

In Fig. 2, the closure panel 10 is shown as being in a closed and latched position relative to the escape opening. Heel sections 25 provided on each of the handles substantially abut against lateral faces of the lugs 13, and latch means, each corresponding to one of the lugs 13, retain the closure panel in position. Thus, as best shown in Fig. 5, a rounded depression 35 is formed in a lateral face of each of the lugs 13. A spring 27 and snap button 28 are mounted in a recess 26 afforded in the heel sections of the handles. Each of the springs 27 is held under compression by a flat plate 29, the latter being retained in position as by a screw 32 and provided with overhanging nose elements 31. As will be clear from Figs. 5 and 7, the nose elements 31 are configured so as to define an inside diameter somewhat less than the greatest diameter of button 28 so that only a predetermined portion of the latter will be free of recess 26 in position to be seated within the confines of depression 35. It will be appreciated that the depressions 35 are rounded in order that the snap buttons will be urged rearwardly against the action of the springs when the handles are urged clockwise or in a forward direction from the position in Fig. 2 to the position in Fig. 3.

The closure panel 10 is latched in position at four points defined by the location of lugs 13 and by means of the four snap buttons 28, each spring-urged into a corresponding depression 35. In order that the closure panel 10 may be quickly and efficiently disengaged with respect to the channel member 40, the forward end portion of each handle is provided with cam means in the form of a tapered projection 30 flattened along the topside, as viewed in Fig. 2, so as to lie flat against the underside of the corresponding one of the plates 12. When it becomes necessary to disengage or unlatch the closure panel to afford a means of egress through the escape opening, the grip portion of any one of the handles is grasped and rocked in a clockwise or forward direction as viewed in Fig. 2, to the position in Fig. 3. The other three handles are actuated in the same manner and at the same time, and each of the cam elements 30 at the forward ends thereof is brought to bear against the underside of the plates 12 to exert a thrusting action against the underside of the panel to force the closure panel upwardly and out of engagement with respect to the channel member 40 as shown in Fig. 3, whereupon the closure panel may be manually shifted as a body along the top of the cab to completely expose the escape opening. At the commencement of such clockwise movement of the handles, each of the snap buttons will be quickly cammed back into the recesses 26, and if it is desired to subsequently replace the closure panel, cam surfaces as 36 may be conveniently employed to assure smooth action of the snap buttons during return or reverse movement of the actuating handles to the latching position of Fig. 2. The apices of the cam elements or forward projections 30 are, of course, formed to extend beyond the axes of rotation of the actuating handles, defined by the transverse bars, a sufficient distance to assure positive disengagement between channel member 40 and flange 11 of the closure panel 10.



As a means for increasing the effective thrust of the cam means 30 on the underside of plates 12, and as a further assurance to simultaneous action of all four handles, a bar 10, Fig. 4, is extended between a transverse pair of handles, as 21 and 22, in position to be readily grasped when needed.

From the foregoing, it will be seen that the escape hatch of the present invention may be provided in a conveyance within a minimum of space, with the actuating handles normally disposed in an out-of-the-way position. When in place, this closure panel will be efficiently retained against displacement, but at the same time the novel arrangement of parts permits the escape panel to be instantaneously sprung at all points of retention. In this connection, the device has particular utility in aircraft, for the thrusting action of the cam means on the actuating handles will force the closure panel into the air-stream. Moreover, it will be appreciated that the escape hatch of the present invention is not hinged.

While we have shown and described the preferred embodiment of the present invention, structural changes and modifications may be made as desired by those skilled in the art, and therefore we intend to be limited only by the scope of the following claims.

We claim:

1. In an enclosed conveyance provided with an escape opening bordered by a retaining channel, an escape hatch assembly comprising, a closure panel having a bordering flange adapted to fit into said channel, a first and second mounting bar extending longitudinally of said opening along opposite sides thereof, a first and second shaft extended transversely of said opening adjacent the opposite ends thereof and mounted for rotation in said mounting bars, four handles each splined to the projecting ends of said shafts and opposite pairs of said handles being linked whereby rocking movement in a forward or reverse direction imparted to one of said handles is transmitted to the other three, each of the handles being provided with a projection at the forward end adapted to exert a thrusting action against the bottom of the closure panel when the handles are rocked in a forward direction, abutment means depending from the bottom of the closure panel and each corresponding to one of the handles, and releasable spring-actuated latch means mounted in each of the handles for engaging a depression provided in each of the abutment means when the handles are rocked in a reverse direction.

2. In an enclosed conveyance provided with an escape opening, an escape hatch assembly comprising, a closure panel of a size adapted to sealably fit over said opening, shafts extending transversely of the opening adjacent the opposite ends thereof, said shafts being supported for rotation in means fixed to the conveyance, handles connected to the ends of the shafts and being arranged in pairs along the opposite longitudinal sides of the opening, said pairs of handles be-

ing linked whereby forward or reverse rocking movement imparted to one of the handles is transmitted to the others, latch means carried by each of the handles, and means fixed to the bottom of the panel engageable by the latch means, the forward end of each of the handles projecting beyond the axis of rotation thereof a distance sufficient to exert a thrust against the bottom of the panel when rocked in a forward direction.

3. An escape hatch for an enclosed conveyance provided with an escape opening comprising, a closure panel of a size adapted to fit over said opening in a sealing position, fixed shaft-supporting means, a pair of shafts rotatable in the said means and extending transversely of the opening, handles fixed to the opposite ends of each of the shafts for movement therewith in a forward or reverse direction, longitudinal means interconnecting a pair of handles whereby movement imparted to one is transmitted to the other, abutment means depending from the bottom of the panel each corresponding to one of the handles, cam means on each of the handles for forcing the panel out of said position when the handles are moved in a forward direction, and latch means carried by each of the handles for engaging the corresponding abutment means when the handles are moved in a reverse direction.

4. An escape hatch for an enclosed conveyance comprising, a panel of a size adapted to seal an escape opening in said conveyance, a flange depending from the opposite sides and ends of said panel and being adapted to fit into a channel bordering said opening, fixed lugs depending from and arranged in first and second pairs along the opposite side edge portions of said panel, a first and second pair of handles corresponding to said pairs of lugs and each being mounted for shifting movement in a forward and reverse direction beneath said panel, each of said handles being provided with latching means for releasably engaging depressions provided in said lugs, each of said handles being provided with camming means for exerting a thrusting action against the bottom of said panel when the handles are moved in a forward direction, each pair of said handles being interconnected by link means, and opposite ones of said handles being splined to a common shaft rotatably supported in position on said conveyance whereby shifting movement imparted to any one of said handles is transmitted to the others.

5. In an enclosed conveyance provided with an escape opening, an escape hatch comprising, a panel of a size adapted to fit over said opening in sealing position with respect thereto, a first and second pair of handles mounted in said conveyance for rocking movement in opposite directions below said panel, each pair of handles being interconnected whereby rocking movement imparted to one pair is transmitted to the other, opposite ones of said handles being connected in pairs to a shaft rotatably supported in said conveyance, means at one end of each of said handles adapted to force the panel out of said position when the handles are rocked in one direction, and means for releasably latching said panel in position over the escape opening when the handles are rocked in the other direction.



6. An escape hatch for an enclosed conveyance provided with an escape opening and comprising, a panel adapted to fit over said opening in sealing position, depending lugs arranged in pairs on opposite sides of said panel adjacent the ends thereof, pairs of handles corresponding to said lugs and being positioned therebeneath, each of said handles being adapted to be rocked in opposite directions and all of said handles being interconnected whereby rocking movement imparted to one is transmitted to the others, each of said handles being provided with means to force the panel outwardly of the opening when the handles are rocked in one direction, and each of said handles being provided with latching means for releasably engaging said lugs when the handles are rocked in the other direction.

7. An escape hatch adapted for use with an escape opening comprising, a panel of a size and configuration corresponding generally to that of said opening, said panel having a top-side to face outwardly of said opening and an under-side to face inwardly of said opening, handles mounted for rocking movement at the under-side of said panel adjacent the corners of said panel and arranged to be simultaneously actuatable in a forward or reverse direction, latch means to hold said panel in place over said opening, said latch means being releasable when said handles are rocked in said forward direction, and means carried by said handles to bear against said under-side of said panel to force the same outwardly of said opening when said handles are moved in said forward direction.

8. An escape hatch for use with an escape opening comprising, a panel of a size and configuration corresponding generally to that of said opening, said panel having a top-side to face outwardly of said opening and an under-side to face inwardly of said opening, releasable latch means for holding said panel in place over said opening, handles located at the under-side of said panel and supported for simultaneous shifting movement both in a forward and reverse direction relative to the axes of rotation thereof, said handles normally being disposed in an out-of-the-way retracted position at the under-side of said panel, each of said handles having a free end adapted to engage the under-side of said panel, the axes of rotation of said handles being so located relative to said free ends that said free ends will bear against the under-side of said panel to force the same outwardly of said opening as said handles are moved in said forward direction from said retracted position, said latch means being automatically releasable upon movement of said handles in said forward direction.

CHARLES T. DENKER.
JOHN KMIT.


## REFERENCES CITED

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

UNITED STATES PATENTS

| Number | Name | Date |
|---|---|---|
| 2,033,305 | Roy | Mar. 10, 1936 |
| 2,264,426 | Young | Dec. 2, 1941 |
| 2,295,324 | Arthur | Sept. 8, 1942 |
| 2,370,792 | Hoffman | Mar. 6, 1945 |