Oct. 8, 1946. A. CAMPBELL 2,408,733

ROOF HATCH FOR RAILWAY CARS

Filed Aug. 4, 1944 3 Sheets-Sheet 1

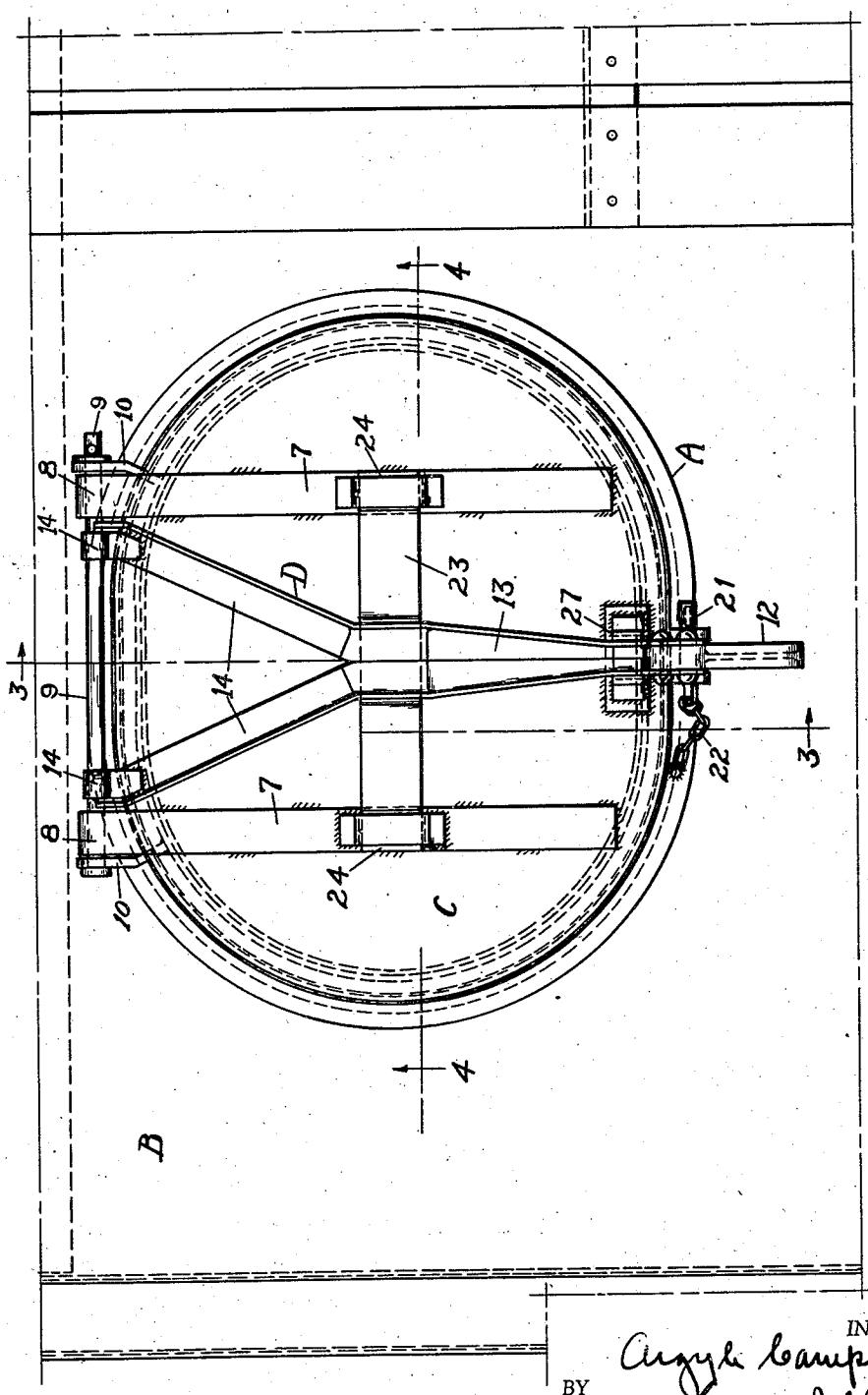


Fig-1

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Oct. 8, 1946. A. CAMPBELL 2,408,733

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Filed Aug. 4, 1944 3 Sheets-Sheet 2

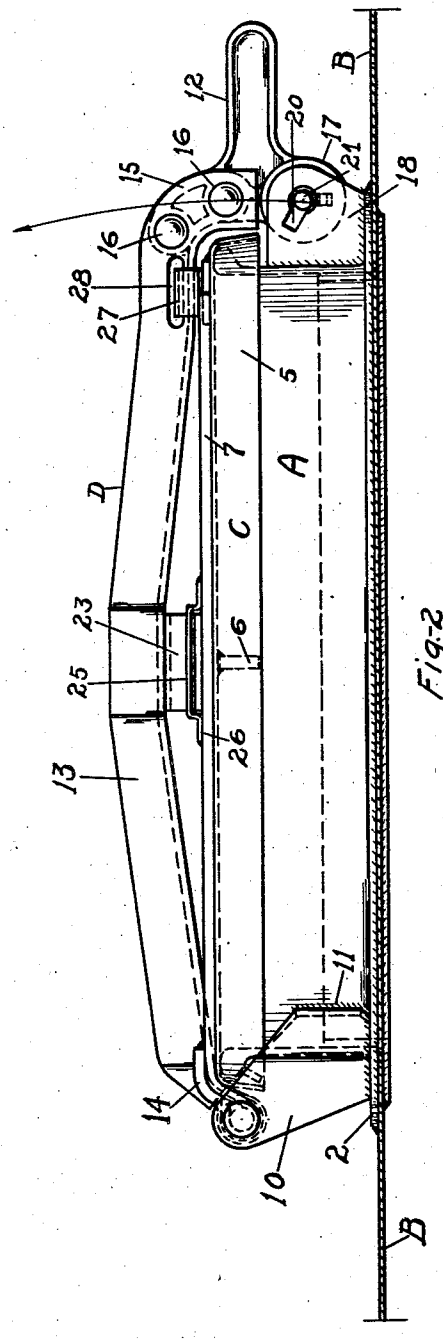


Fig-2

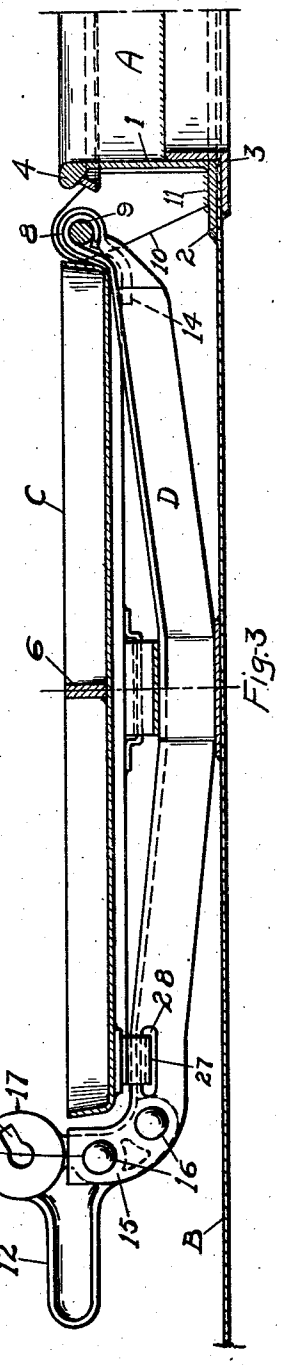


Fig-3

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Filed Aug. 4, 1944 3 Sheets-Sheet 3

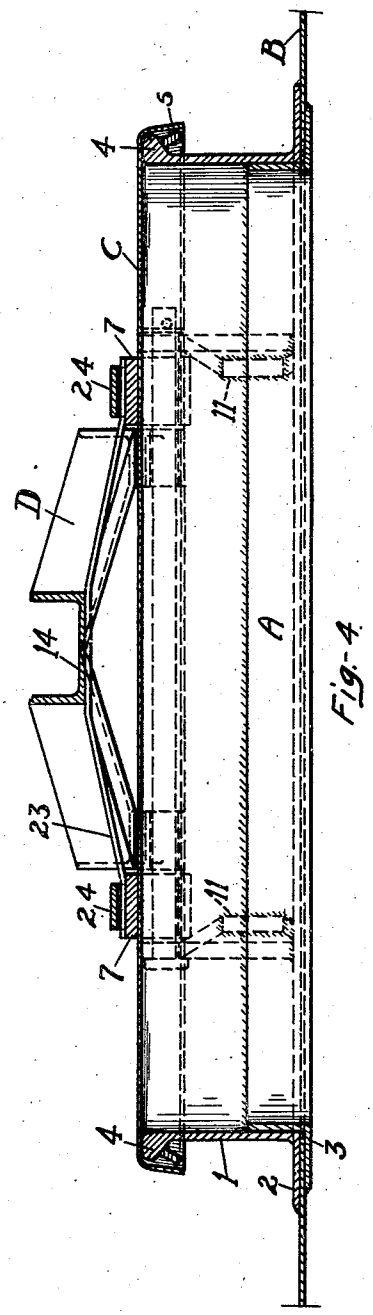


Fig. 4.

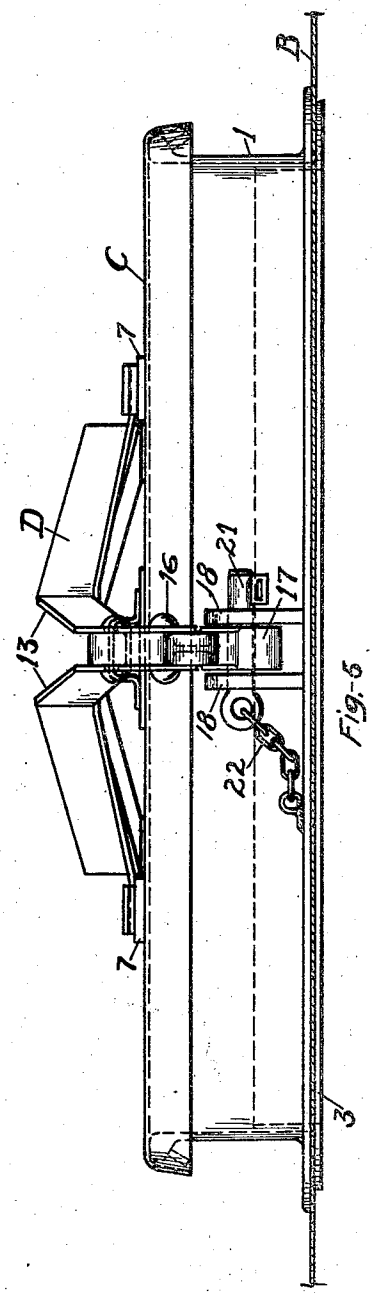


Fig. 5.

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UNITED STATES PATENT OFFICE

2,408,733

ROOF HATCH FOR RAILWAY CARS

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Application August 4, 1944, Serial No. 548,079

6 Claims. (Cl. 105—377)

1

My invention relates to improvements in hatches particularly adapted for the roofs of railway cars.

One of the objects of my invention is to provide a roof hatch structure in which the parts are arranged so that they are welded together, thus avoiding the use of rivets and the leaks incident thereto.

A further object is to provide a hatch structure in which the hatch cover is flexibly and resiliently connected to the operating mechanism in such manner that the clamping or closing pressure on the cover will be uniformly distributed and equalized around the rim or seat of the hatch and thus form an effective seal for the hatch opening.

A further object is to provide a roof hatch structure which is simple yet rugged in construction and relatively less costly to manufacture.

Other objects of my invention will appear from the following description and claims in connection with the accompanying drawings which illustrate one embodiment of the invention.

Referring to the drawings, Fig. 1 is a top plan view of the hatch and cover operating mechanism in closed position on the roof of a railway car, a portion of which is shown; Fig. 2 is an end elevation of the hatch structure shown in Fig. 1, looking in a direction lengthwise of the car; Fig. 3 is a partial section substantially on the line 3—3 of Fig. 1, showing the hatch cover in fully open position; Fig. 4 is a longitudinal section on the line 4—4 of Fig. 1; and Fig. 5 is a side elevation of the hatch structure shown in Fig. 1.

The structure shown in the drawings comprises in general a hatch A mounted on the roof B of the car, a cover C, and the operating mechanism D for the cover.

The hatch in the present structure is generally of oval shape, and the hatch opening in the car roof is bounded by the angle member having an upright flange 1 which forms the wall of the hatch and having a horizontal flange 2 which overlies the margin of the roof and by which the hatch is secured by welding to the car roof. An inner angle member 3 surrounds the opening margin and its horizontal flange overlies the roof margin on the under side thereof, and the vertical flange extends along the inner side of the hatch wall. These parts are all secured together by welding to rigidly attach the hatch to the roof and provide a watertight joint. The upper edge of the hatch wall 1 has a bead or bulb 4 which forms a seat for the hatch cover C, this

2

bead being flattened somewhat on its upper edge to broaden the area of contact with the cover.

The cover C is a flat pan-shaped structure, the downturned marginal flange 5 of which overlies the marginal bead or seat of the hatch wall to prevent the entrance of water and dirt. The cover is suitably reinforced by a central longitudinal rib 6 on its under side, as shown more clearly in Figs. 2 and 3.

The cover is hinged at one of its longitudinal sides so as to swing from closed position to fully open position, as shown in Fig. 3, upon the roof of the car. In the present structure the hinges comprise spaced parallel straps 7 which extend substantially across the upper side of the cover and are secured thereto by welding. At one side of the cover these straps extend beyond the margin of the cover and their ends are turned to form hinges 8 which are mounted upon a hinge shaft 9. The hinge shaft is mounted in triangular shaped lugs 10 which are secured by welding 11 to the vertical and horizontal flanges 1 and 2 of the hatch.

The operating mechanism D for the cover bridges the cover and at one side of the hatch is hinged and at the other side is provided with a suitable handle 12 and locking means for securing the operating mechanism in closed position. The operating mechanism D is formed of angle members 13, the horizontal flanges 14 of which extend inwardly toward each other. These angle members at the hinge side of the structure are spaced apart and their downturned ends are provided with hinge members 14 which are mounted on the hinge shaft 9. These angle members are converged to a point above the center of the cover where their inturned flanges 14 meet and are welded together. At this central point, the angle members are continued in parallel for a short length. From this central point the vertical flanges of the angle members are converged toward the outer margin of the cover so that they are spaced apart a lesser distance. This is accomplished by tapering the inturned flanges 14 and abutting their edges which are welded together. The end portions 15 of the vertical flanges are turned downwardly and the handle member 12 is secured between these downturned ends by means of rivets 16. The handle member 12 has a depending portion 17 forming part of the locking mechanism. This depending portion 17 is adapted in closed position of the mechanism to enter between the two spaced lugs 18 which are welded in position in the angle between the vertical and horizontal flanges 1 and 2

of the hatch. Both the depending lugs 17 and the keeper lugs 18 are provided with key slots 19 and 20 respectively, which are adapted to register in the closed position of the mechanism so that a locking key 21 can be inserted therethrough and rotated to lock the parts in place. This key is carried by a suitable chain 22 secured to the hatch, so that the key will not become lost.

As shown more clearly in Fig. 2, the angle members of the operating mechanism D are arched upwardly above the central portion of the cover to provide room for the flexible or resilient connection between the operating mechanism and the cover. This flexible connection is preferably in the form of an arched leaf or plate spring 23 which is secured by welding at its center portion to the under side of the parallel flange portion of the angle members D and which are extended longitudinally in both directions from this center portion to the spaced hinge strap 7 where its ends 24 bear upon the hinge straps. Thus when the operating mechanism D is in its closed position, it yieldingly applies pressure through the medium of the spring 23 to the two points on the cover where the ends of the spring bear upon the hinge strap 7. Since these points are located in the longitudinal axis of the cover and at equal distances from the operating mechanism, the clamping pressure will be uniformly distributed and equalized throughout the area of the cover with the result that the cover will be uniformly and evenly pressed against the rim 4 of the hatch. This flexible connection between the operating mechanism and the cover thus allows for any irregularities in manufacture and assembly of the parts and thus insures a uniformly tight joint throughout the contact of the cover with the rim of the hatch. In order to provide slip joints between the end portions of the spring 23 and the cover to allow for the variation in the length of the spring due to its flexing, the straps 25 are bridged over the ends 24 of the spring and their ends 26 are welded to the hinge straps 7.

The operating lever D has no other connection, except through the spring 23, with the cover through which pressure is applied to the cover. It is necessary, however, to provide a positive connection between the cover and the lever D to raise the cover from its closed position. At the handle end of the operating mechanism, an elongated loop member 27 is secured by welding to the upper side of the cover adjacent the margin thereof. This loop member extends through slots 28 in the vertical flanges of the angle members 13 and thus provides a positive connection between the operating lever and the cover by which the lever will positively and solidly lift the cover. The loop member and the slots 28 are sufficiently large, however, to provide considerable play or lost motion so that the lever does not actually bear upon the cover or apply pressure thereto at this point.

While I have herein described and claimed what I consider the preferred method of carrying out my invention, the same is merely illustrative and I contemplate such changes as fairly fall within the scope of my invention.

I claim:

1. In a roof hatch of the class described, the combination of a hatch wall defining a hatch opening and having a seat on its upper margin, a pan-shaped cover hinged on said hatch wall and adapted to be pressed upon said seat, an operating mechanism bridging the cover and hinged at one side adjacent the cover hinge, means at the other side of said operating mechanism for holding said operating mechanism in closed position, and a resilient means carried by said operating mechanism and bearing upon said cover to apply pressure to hold the cover upon its seat.

2. In a roof hatch of the class described, the combination of a hatch wall defining a hatch opening and having a seat on its upper margin, a pan-shaped cover hinged at one side on the hatch wall and adapted to be pressed upon said seat, an operating mechanism bridging the cover and hinged at one side adjacent the cover hinge, means at the other side of said operating mechanism for holding said operating mechanism in closed position, and means for uniformly pressing the cover upon its seat, comprising a spring member mounted upon said operating mechanism and bearing upon said cover in substantially the central portion thereof.

3. In a roof hatch of the class described, the combination of a hatch wall defining a hatch opening and having a seat on its upper margin, a pan-shaped cover hinged at one side on the hatch wall and adapted to be pressed upon said seat, an operating mechanism bridging the cover and hinged at one side adjacent the cover hinge, means at the other side of said operating mechanism for holding said operating mechanism in closed position, means for uniformly pressing the cover upon its seat, comprising a spring member mounted upon said operating mechanism and bearing upon said cover in substantially the central portion thereof, and a lost motion connection between the cover and the operating mechanism adjacent the margin of the cover.

4. In a roof hatch for railway cars, the combination of a hatch wall defining a hatch opening and having a seat on its upper margin, a flat pan-shaped cover hinged adjacent one side of the hatch wall and adapted to be pressed upon said seat in closed position, an operating lever hinged at one end on the same axis as the hinge of the cover and extending over the cover to the opposite side thereof, means at said opposite end of said lever for holding the lever in closed position, and means for applying pressure uniformly upon the cover and seat it on said seat, comprising a spring member carried upon said lever and disposed transversely of the lever, said spring being arranged with its end portions bearing upon the cover at separated points in the longitudinal axis of the cover, and slip joint connections between the end portions of said spring and said cover.

5. In a roof hatch for railway cars, the combination of a hatch wall defining a hatch opening and having a seat on its upper margin, a flat pan-shaped cover hinged adjacent one side of the hatch wall and adapted to be pressed upon said seat in closed position, an operating lever hinged at one end adjacent the hinge of the cover and extending over the cover to the opposite side thereof, means at said opposite end of said lever for holding the lever in closed position, means for applying pressure uniformly upon the cover and seat it on said seat, comprising a spring member carried upon said lever and disposed transversely of the lever, said spring being arranged with its end portions bearing upon the cover at separated points in the longitudinal axis of the cover, slip joint connections between the end portions of said spring and said cover, and an elongated loop member secured to the cover adjacent the margin thereof on the side opposite

the cover hinge and extending through slots in said lever, said slots and loop being sufficiently large to provide sufficient play to prevent the lever applying pressure to the cover.

6. In a roof hatch for railway cars, the combination of a hatch wall defining a hatch opening and having a seat on its upper margin, a flat pan-shaped cover adapted to be pressed against said seat in the closed position of said cover and hinged adjacent one side of the hatch wall, an operating lever hinged at one end adjacent the cover hinge, means at the opposite side of said hatch for holding the lever in closed position, said lever comprising angle members

joined together and extending across the cover and being arched above the central portion of the cover, a leaf spring secured to the under side of said angle members at the arched portion thereof and having its ends yieldingly bearing on the cover at separated points in substantially the longitudinal axis of the cover, loop members secured to the cover and bridging the end portions of said spring to provide slip joint connections between the spring and the cover, and a lost motion connection between the cover and said operating lever adjacent the margin of the cover opposite the hinge thereof.

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