United States Patent [19]

Hutchison et al.

[11] **3,916,800**

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[54] **LATCHING ARRANGEMENT FOR HATCH COVER**

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[73] Assignee: **Pullman Incorporated,** Chicago, Ill.

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[52] **U.S. Cl.** **105/377;** 114/203; 292/260

[51] **Int. Cl.²** **B61D 39/00**

[58] **Field of Search**..... 105/377; 114/177, 201 R, 114/201 A, 203; 292/256.5, 259, 281, 282, 283, 284, 285, 286, 260

[56] **References Cited**

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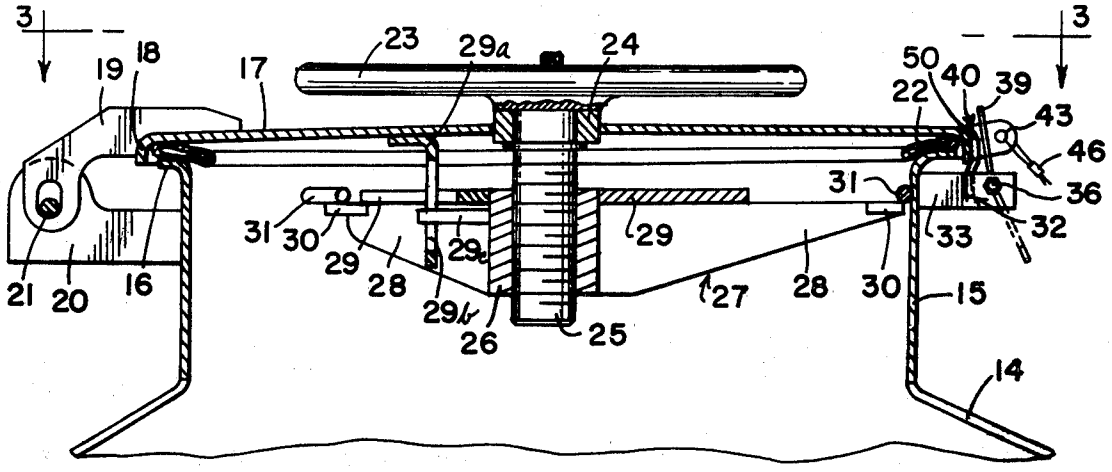
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Attorney, Agent, or Firm—Richard J. Myers

[57] **ABSTRACT**

A hatch cover for opening and closing the hatch structure of a vehicle hopper includes a locking mechanism which may be actuated by means of a rotatable hand wheel supported on top of the cover. The cover is hingedly connected to the hatch structure, and upon unlocking of the locking mechanism, may be hinged upwardly from a closed to an opened position. The latch mechanism is provided on one side of the cover which also includes a resilient or compressible locking seal. The latch mechanism provides a secondary lock for the hatch cover and includes elements which in interengagement serve to indicate that the gasket seal has been sufficiently compressed during the locking action of the locking mechanism to thereby effectively seal the hatch opening.

2 Claims, 5 Drawing Figures



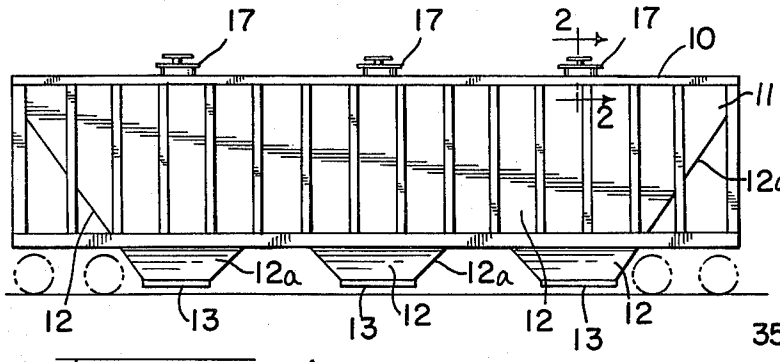


FIG. 1

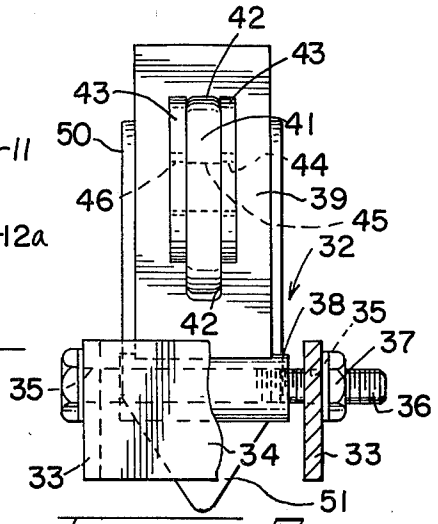


FIG. 5

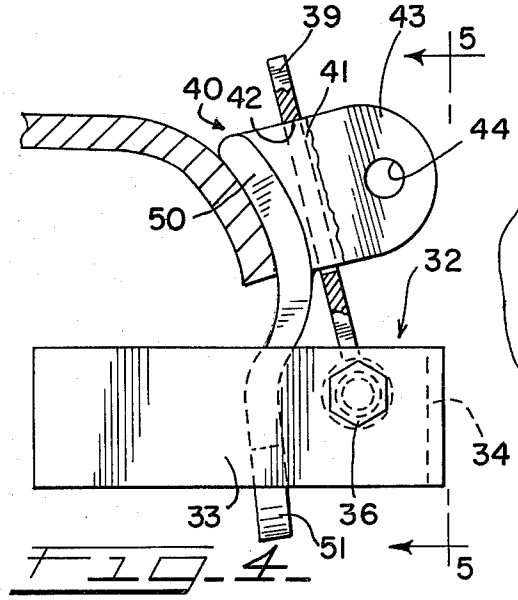


FIG. 4

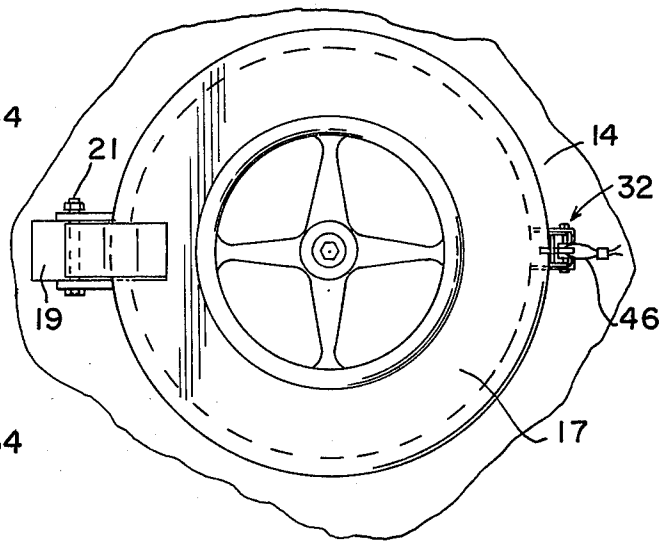
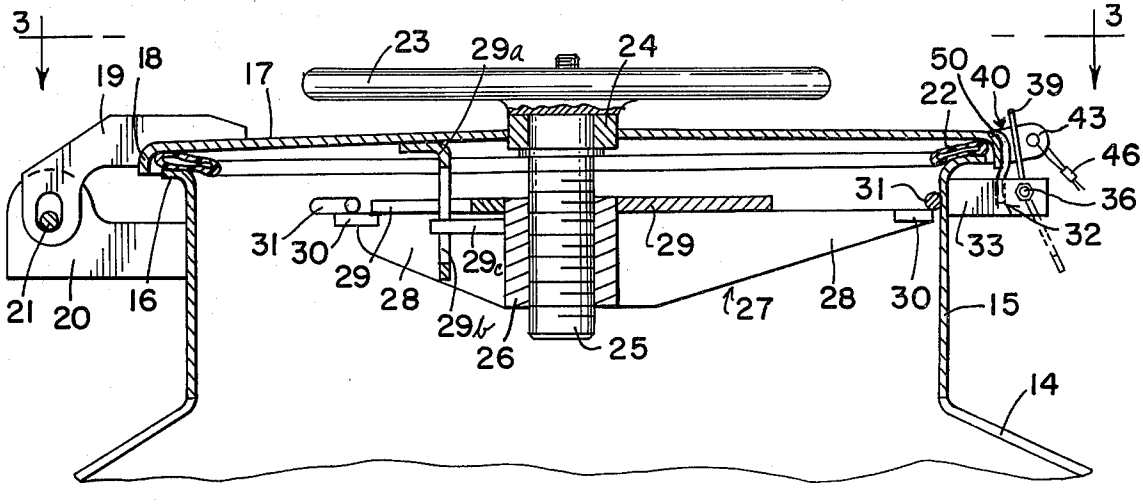


FIG. 3

FIG. 2



LATCHING ARRANGEMENT FOR HATCH COVER

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to hatch covers and hatch structures provided on vehicles such as railway hopper cars.

2. Description of the Prior Art

Prior art patents are: 201,076; 202,267; 1,663,068; 3,041,099; 3,145,039; 3,155,052 and 3,228,353.

SUMMARY OF THE INVENTION

This invention relates to hatch covers of a type used in vehicles such as railway hopper cars. A hatch cover locking and unlocking device is utilized which includes a rotatable locking handle having a locking spider arm assembly connected to the lower portions thereof, the same being engageable with locking lugs spaced around the inner periphery of a tubular trough forming an inlet opening into the hopper. The hatch cover is moved in a generally vertical direction about a pivot and includes on its inner surface a compressible gasket or sealing element which is adatped to engage a peripheral flange extending circumferentially around the upper edge of the tubular trough. As the locking device handle wheel is rotated and the locking spider engages the lugs on the inner portion of the tubular trough, the gasket is compressed to form an effective and positive seal above the circumferentially extending flange.

An additional or auxiliary latch is provided at one edge of the cover which includes a locking element projecting laterally outwardly with respect thereto. A latch device including a bracket which is connected to the tubular trough is provided with an elongated slot and during counterclockwise hinging movement of the latch element, the locking tab becomes disposed in the slot and projects laterally outwardly therefrom. The locking tab also includes ears provided with holes which are in registry with a hole in the locking tab within which a car seal is secured. Disposition of the latch element is such that once it is engaged with the locking tab the seal element has been sufficiently compressed to provide for an effective seal about the peripheral edge of the tubular trough. Thus, while the latch element and parts thereof provide auxiliary latching of the cover, the latch is so constructed that it effectively guarantees positive sealing by the compressed seal since the latch element will not be engaged with the locking element until such compression is achieved.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side elevational view of a railway hopper car employing a hatch cover including the arrangement of the present invention;

FIG. **2** is a cross-sectional view taken substantially along the line **2—2** of FIG. **1**;

FIG. **3** is a plan view of the arrangement shown in FIG. **2**;

FIG. **4** is an enlarged side elevational view of portions of a latch element and lock arrangement; and

FIG. **5** is an elevational view taken along the line **5—5** of FIG. **4**.

DETAILED DESCRIPTION OF THE INVENTION

Referring now particularly to FIG. **1**, a railway hopper car **10** is disclosed. The car **10**, or similar vehicle, may include side walls **11** provided with one or more hoppers **12**. The hoppers **12** are of conventional construction including the usual sloping walls **12***a* and are provided at their lower portions with conventional discharge gates **13** schematically shown. These gates are well-known in the art and may be of conventional construction forming no part of the present invention. The upper extremity of the car **10** includes the usual roof or covering wall **14**, and in the car shown in FIG. **1**, three hoppers **12** are disclosed. Access to each of these is through a tubular neck, or cylindrical wall **15**, one of which is best shown in FIG. **2**. The tubular neck **15** includes an outer peripheral flange **16** at its upper extremity. A cover is designated at **17** and includes a downwardly extending peripheral flange **18** adapted to overlie or overlap the flange **16**, as best shown in FIG. **2**. The cover **17** is supported for hinging movement by means of a hinge bracket **19** provided on the cover and a hinge bracket **20** connected to the tubular neck **15**. A hinge pin **21** suitably connects the brackets **19** and **20** for relative hinging movement.

The underneath side of the cover **17** is provided with a resilient or compressible seal **22**, which as disclosed in the present invention, may be of tubular form though other seals of other shapes may be utilized. A locking mechanism for locking the cover in a closed position includes a hand wheel **23** journaled in a bearing **24** rigidly supported on the cover **17**. The hand wheel **23** has connected thereto a threaded stud **25** for rotation with said hand wheel **23**. A threaded sleeve **26** is vertically movable relative to the threaded stud **25** and includes a spider generally designated at **27**. The spider comprises a plurality of arms **28** only two of which are shown in FIG. **2**. Reinforcing gussets or plates **29** suitably connect the threaded sleeve **26** and the arms **28**. Lugs **30** are connected to the outer ends of the arms **28** and these are adapted to engage stop lugs **31** rigidly secured to the inner surfaces of the tubular neck **15**. A bracket **29***a* is rigidly connected to the underneath side of the cover **17** and projects downwardly with respect thereto. The bracket **29***a* includes a slot **29***b* which extends vertically and within which a follower **29***c* is positioned for vertical movement as the spider moves in a vertical direction. Details of the locking mechanism just described are more specifically disclosed in the above-mentioned related patent application.

Referring particularly to FIGS. **2**, **4** and **5**, a latch bracket arrangement is generally designated at **32** and comprises a pair of laterally spaced parallel arms **33** which are rigidly secured to the outer surface of the neck **15** immediately below the flange **16**. A connector wall **34** connects the arms **33**. The arms **33** are provided adjacent their distal ends with aligned openings through which a hinge screw **36** extends and is secured thereto by means of a nut **37**. A sleeve **38** is rotatably hinged on the hinge screw **36** and is rigidly connected to a flat latch element **39**. The latch element **39** may be moved about the hinge screw **36** between clockwise and counterclockwise positions. A lock member **40** includes a slender tab or tongue **41** having its plane in a vertical plane and which in the locked position is engaged, as shown in FIG. **5**, within a slot **42** of the latch element **39**. The tongue **41** is attached to a guide plate **50** connected to the outer flange **18** of the cover **17**. The guide plate **50** has a lower portion **51** slightly less in width than the width of the arms **33** which guide the guide plate **50** therebetween. The latch element **39** also has connected thereto, as best shown in FIG. **5**, out-

wardly projecting ears **43** parallel to the tongue **41** and which have apertures or openings **44** in aligned relation, the same openings also being in alignment with an opening **45** provided in the tongue or tab **41**, as best shown in FIGS. **4** and **5**. As indicated in FIGS. **2** and **3**, a car seal **46** is adapted to be inserted through the openings **44** and **45**.

The Operation

The operation of the hand wheel and locking mechanism is more specifically described in the aforementioned application. In the lock position as shown in FIG. **2** of the cover **17**, the seal **22** is properly compressed between the flanges **18** and **16** to effectively seal the neck **15** from any possible leakage. To open the cover **17**, it is first necessary to pivot the latch element **39** in a clockwise direction free of the tab **41** after the car seal has been removed. The hand wheel **23** is now rotated in a manner wherein the spider **27** moves downwardly below the latch lugs **31**. The follower **29***c* follows the shape of the slot **29***b* which is of serpentine configuration, thus moving the lugs **30** in a rotative manner with the spider **27** wherein the lugs **30** are moved to one side of the stop lugs **31**. The cover may now be opened by rotation of the same around the hinge brackets **19** and **20**.

To again close the cover to the closed position shown in FIG. **2**, the reverse operation takes place and the hand wheel is moved to again lock the spider in position wherein the lugs **30** engage the stop lugs **31**. As the hand wheel **23** continues to be rotated the seal **22** is compressed. To assure that proper compression of the seal takes place, so as to effectively seal the neck **15**, the latch element now comes into operation. If the seal is insufficiently compressed, counterclockwise rotation of the latch element **39** will not permit the tongue or tab **41** to be inserted through the opening **42**, as shown in FIG. **4**, since the upper edge of the tab **41** will still be above the upper edge of the opening and no engagement is possible. Only after the cover has been sufficiently moved downwardly to permit the tab **41** to enter into the slot **42** can the engagement of the latch element with the locking member **40** take place and this is only possible when the cover has been sufficiently moved downwardly to effectively compress the seal **22** to the desired extent, as shown in FIG. **2**. The car seal is then applied and the hopper is properly sealed.

What is claimed is:

1. In a vehicle hopper arrangement having

a lower discharge portion,

a horizontal covering wall at the upper portion of said hopper including a vertical tubular wall having an upper flange defining an inlet opening into said hopper,

a cover supported on said covering wall movable upwardly from a closed position to an open position,

said cover having a peripheral portion and a flange extending downwardly from the peripheral portion and being adapted in the closed position to overlap said upper flange,

means for moving said cover between said positions including manually operable means for tightly urging said peripheral portion toward said upper flange; the improvement comprising,

a seal arrangement for sealing said inlet opening in the closed position of said cover including;

a resilient seal supported on the underneath side of the peripheral portion of said cover and in the closed position being disposed adjacent and coextensive with both said peripheral portion and said upper flange,

a latch bracket including a pair of spaced parallel arms connected to and projecting laterally from said tubular wall,

a latch element pivotally connected between said arms adjacent the distal ends of the arms,

a guide plate connected to the flange of the cover and extending downward therefrom,

the lower portion of the guide plate having a width slightly less than the spacing between the pair of arms for being received between the pair of arms toward the connected ends of the pair of arms from the latch element,

a tongue attached to the guide plate and projecting laterally from the cover,

said tongue having its plane in a vertical plane,

said latch element having a slot for receiving said tongue only when said cover is in a closed position with a predetermined degree of compression of said resilient seal,

said tubular wall including stop means therein,

said means for moving said cover including a hand wheel rotatably connected to said cover and including rotatable drive means,

driver means connected to said drive means, and

said driver means including vertically movable spider means engageable with said stop means for compressing said resilient seal.

2. The invention according to claim **1** including

a pair of outwardly projecting ears connected to the latch element for extending parallel to the tongue when the tongue is received in the slots of the latch element,

said pair of ears and said tongue having aligned openings for receiving a seal.

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