United States Patent

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[54] **TROUGH COVER SEAL ARRANGEMENT**
12 Claims, Drawing Figs.

[52] **U.S. Cl.** **105/377**
[51] **Int. Cl.** **B61d 39/00**
[50] **Field of Search** ..... 105/377, 368(A)

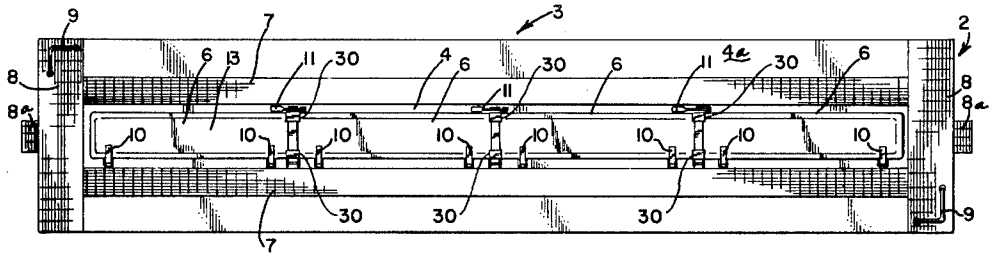
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ABSTRACT: A trough cover seal arrangement for a hopper car hatch comprising a generally V-shaped trough extending transversely of the car and fixedly attached to the hopper spaced apart hatch side coaming portions, the coaming portions being provided with openings above the trough to allow the water in the trough to drain outward of the sides of the car, the top transverse edges of the trough being in sealing relation with weather stripping attached to the end of each of two longitudinally spaced apart covers, each cover end having an upwardly projecting transverse water deflector and a transverse hold-down batten extending over the cover ends and generally parallel to a respective edge of the trough and enclosing each of the transverse water deflectors and the trough.



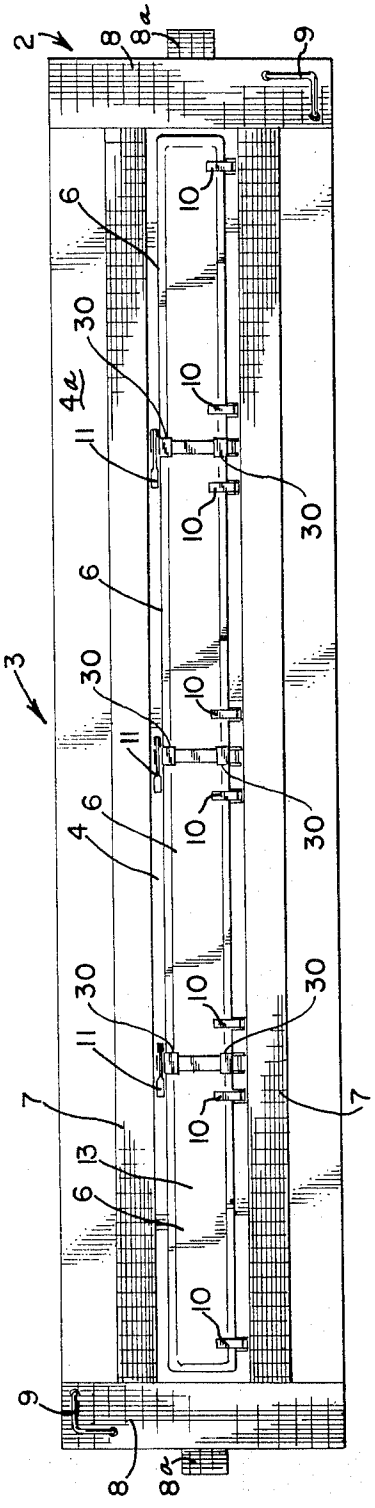


FIG. 1

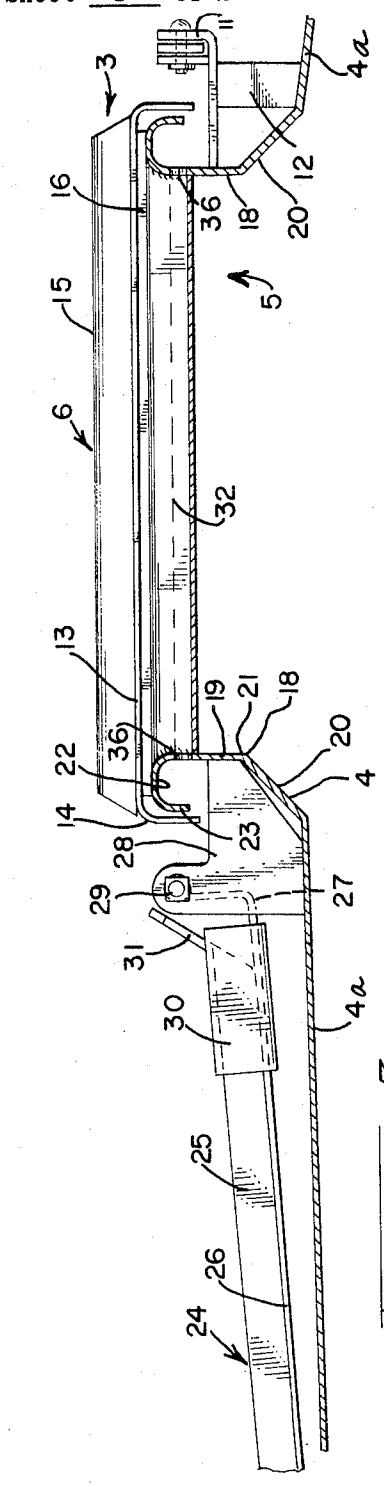


FIG. 3

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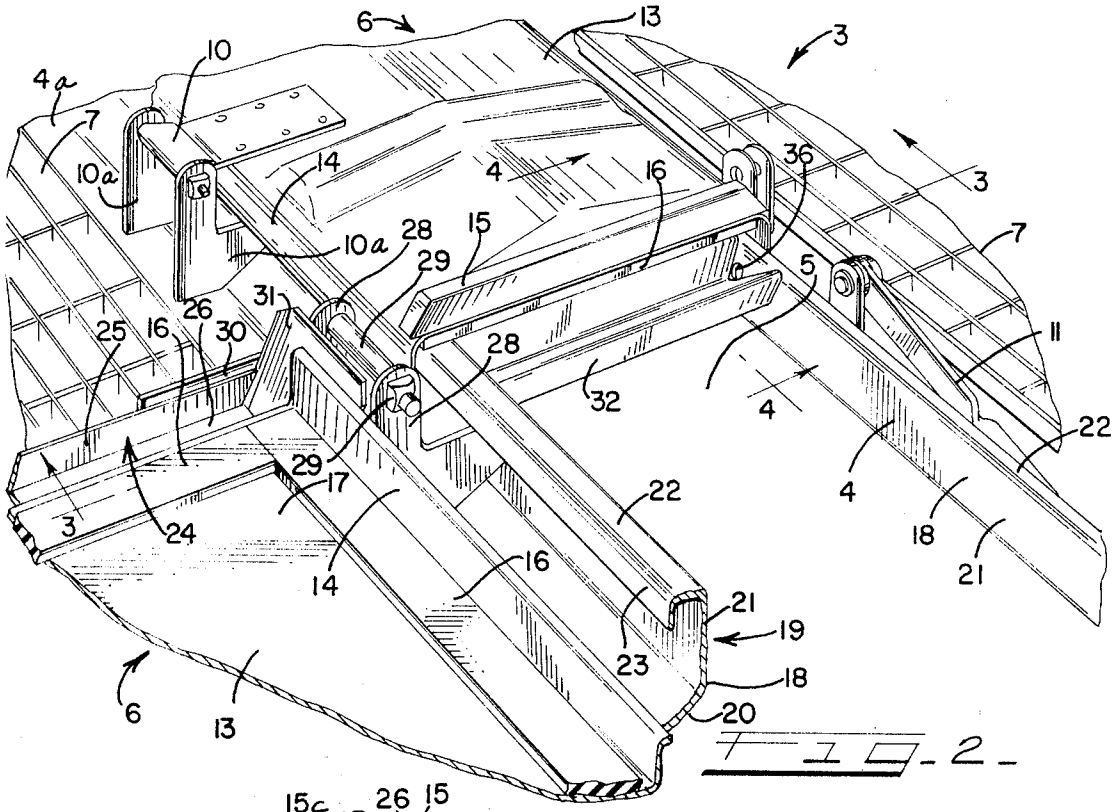


FIG. 2

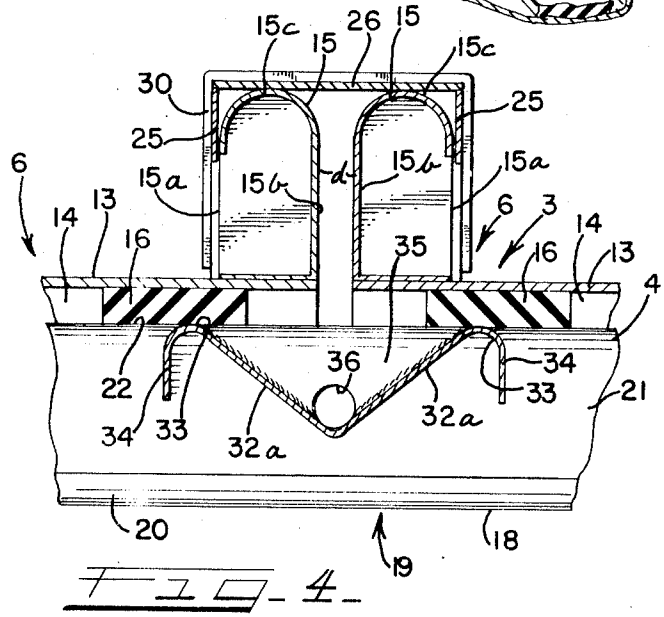


FIG. 4

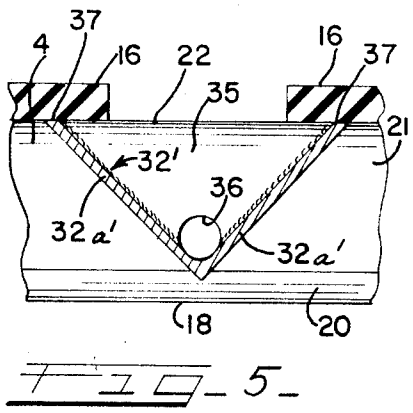


FIG. 5

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TROUGH COVER SEAL ARRANGEMENT

BACKGROUND OF THE INVENTION

(1) Field of the invention. The field of art to which this invention pertains is the railroad hopper car art and in particular relates to the hopper car lading entrant portion or hatch.

(2) Description of the Prior Art. It is known in the prior art to provide various types of hopper car hatch arrangements and in particular to provide for cover means for the hopper car hatches. However, it is important to provide a water-tight and light-tight seal for the hopper porton in order to protect bulk material and meet the customer's requirements of care of such material.

SUMMARY OF THE INVENTION

It is the purpose of this invention to solve the problem of moisture leakage into the hopper car by way of the covered hatch portion. The invention has for its object and purpose to provide for a water-tight and light-tight seal between the cover and the surrounding coaming of the hopper car. The invention provides for a novel water channel means or trough which diverts water or moisture that enters the hatch area outwardly of the car while providing water-tight, light-tight seal between the hopper hatch and the hopper cover by sealing means provided between the trough and the hatch cover. These and other objects and advantages will become apparent from reference to the following description, appended claims and attached drawings.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a top plan view of the hopper car;

FIG. 2 is a perspective partial plan view of the hopper hatch and cover means;

FIG. 3 is a sectional view taken along line **3 - 3** of **FIG.** 2;

FIG. 4 is a sectional view taken along a line **4 - 4** of **FIG.** 3 but with both covers and the batten in the closed position; and

FIG. 5 is a modified form of the trough of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference now to the drawings and in particular **FIGS.** 1 through 4, there is shown a hopper car **2** being provided with a roof portion **3**. The roof portion **3** is provided with a hatch arrangement **4** defining the rectangular elongated material receiving opening **5** enclosed by a plurality of four covers **6**. **FIG.** 1 shows these covers placed in the closed position over the hatch and **FIG.** 2 shows one cover in the closed position and the other cover in the open position and **FIG.** 3 shows the cover in the open position. The car is provided with the usual longitudinally extending laterally spaced apart running boards **7**, the end running boards **8**, and the extensions **8a** of the running boards. The usual hand holds **9** are provided in the two diagonally opposite car corners. Each of the covers is pivotally connected to the roof by vertical arms or hinge means **10** attached to hinge elements **10a** attached to the hatch **4** and the roof sheet **4a** and secured to the roof by the lock means **11** which is supported by support arm **12** on the roof sheet **4a**.

Each of the covers **6** in plan is generally rectangular in shape and includes a top sheet **13** and side sheets **14**. Each cover **6** carries at its end which is adjacent to the end of another cover **6** a transverse elevated elongated rain deflector **15** that is mounted on the edge of the end of the cover top sheet **13** next to an adjacent cover. Sealing means or weather stripping **16** which may be of a resilient or elastomeric material is fastened to the underside **17** of the top sheet **13** all along the peripheral edges thereof for each of the covers **6**.

The trough **4** has ends (not shown) and longitudinally extending side portions **18** which, together with the ends, define the continuous trough coaming **19** around the longitudinal opening **5**. As seen in **FIG.** 3, the coaming **19** has a diagonally

upwardly extending portion **20**, a vertical portion **21** and a top U-shaped or channel portion **22** having an outwardly downwardly extending flange **23** parallel to the sides **14** of the cover **6** when the cover is in place to provide for a small space between the flange **23** and the cover side sheet portion **14**. The cover weather stripping **16** rests in sealing relation on the U-shaped portion **22** of the coaming **19**. Consequently, each of the covers **6** provides for a tight sealing relation between the coaming **19** and the covers **6** both at the ends of the hatch **4** and along the sides of the hatch **4** with the exception of the space between each of two adjacent covers which are spaced apart from one another by the distance d, as seen in **FIG.** 4, that is, the distance between the cover rain deflectors **15**. For each set of covers **6** there is provided on the car roof at the ends where each of two adjacent covers face one another, a hold down batten **24** in the form of an elongated transversely extending member having a pair of side walls **25** and a top wall **26**. The inner end of the hold down batten **24** is provided with a hinge arm **27**, as shown in **FIG.** 3, which is pivotally attached to hinge butts **28** mounted on the coaming and the top roof sheet, as by pivot pins **29**. The free end of the batten **24** couples with the lock means **11** in the closed position (see **FIG.** 1). **FIGS.** 2 and 3 show the hold down batten **24** in the open position and lying on the roof sheet **4a** and **FIG.** 4 shows the batten enshrouding and lying on the respective rain deflectors **15** of a pair of adjacent covers **6**. The hinge end and the lock side of the batten **24** are each provided with a U-shaped baffle **30** which is mounted thereon and enshrouds the side portions of the rain deflectors to minimize entrance of rain or dust or other foreign particles in conjunction with its diagonal side rain deflector plate **31** for uncovering a pair of adjacent rain deflectors **15**. Each rain deflector **15** comprises side walls **15a**, transverse walls **15b**, and top curved wall section **15c** which receive the hold down batten **24**. To prevent entrance of any foreign particles or moisture in between respective adjacent rain deflectors in the space d, there is provided a transverse V-shaped trough or gutter **32**, as shown in **FIG.** 4, and having a pair of diverging walls **32a** extending divergingly upwardly and being joined by curved end sections **33** which have outwardly downwardly extending end portions **34**, the top curved portions **33** supporting the ends of the cover **6** and being in sealing relation with the weather stripping **16**. The upwardly extending diverging transverse wall portions **32a** defining the V-shaped section are attached to opposite sides **21** of the coaming **19** and define a trough area **35** for catching the foreign particles for transferring them to openings **36** in the coaming **19** and outwardly of the sides of the hopper car. **FIG.** 5 shows a modified trough or gutter means **32'** which is similar to the trough arrangement **32** except that the top curved portions **33** are eliminated and wherein the upward outwardly diverging walls **32a'** have their outer straight ends **37** engaging the weather stripping **16**.

The foregoing description and drawings are given merely to explain and illustrate the invention, and the invention is not to be limited thereto, since those skilled in the art who have the disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

I claim:

1. A trough cover seal arrangement for a hopper hatch comprising:

a pair of longitudinally extending upright coaming portions defining a hopper hatch,

a transverse trough joining with the coaming portions and having a pair of top transverse edge portions,

aperture means in each coaming portion above the bottom of the trough for conducting particles in the trough outwardly of the hopper,

a pair of longitudinally spaced hopper covers spaced apart from one another and having their respective end portions extending toward one another over the trough,

each cover end portion having transverse weather stripping abutting and sealing with the respective transverse edge portion of the trough and the coaming por-

tions in sealing relation to prevent entrance of foreign particles into the hatch.

2. The invention according to claim 1, and said edge portions each being curved.

3. The invention according to claim 1, and said edge portions each being straight.

4. The invention according to Claim 1, and said cover end portions being provided with upright end ring deflectors spaced over the trough

5. The invention according to Claim 1, and lock means securing the batten means to the roof of the hopper and locking the cover end portions to the hopper.

6. A trough cover seal arrangement for a hopper hatch comprising:

a pair of longitudinally extending upright coaming portions defining a hopper hatch,

a transverse trough joining with the coaming portions and having a pair of top transverse edge portions,

aperture means in each coaming portion above the trough for conducting particles in the trough outwardly of the hopper,

a pair of longitudinally spaced hopper covers spaced apart from one another and having their respective end portions extending toward one another over the trough,

each cover end portion having transverse weather stripping abutting with the respective transverse edge portion of the trough in sealing relation to prevent entrance of foreign particles into the hatch,

said cover end portions each being provided with upright end rain deflectors spaced over the trough,

batten means extending over and about each of the rain deflectors, and

lock means securing the batten means to the roof of the hopper and locking the cover end portions to the hopper.

7. A trough cover seal arrangement for a hopper hatch comprising:

a pair of longitudinally extending upright coaming portions defining a hopper hatch,

a transverse trough joining with the coaming portions and having a pair of top transverse edge portions,

aperture means in each coaming portion above the trough for conducting particles in the trough outwardly of the hopper,

a pair of longitudinally spaced hopper covers spaced apart from one another and having their respective end portions extending toward one another over the trough,

each cover end portion having transverse weather stripping abutting with the respective transverse edge portion of the trough in sealing relation to prevent entrance of foreign particles into the hatch,

said cover end portions each being provided with upright end rain deflectors spaced over the trough,

batten means extending over and about each of the rain deflectors, and

lock means securing the batten means to the roof of the hopper and locking the cover end portions to the hopper,

baffle means extending from the hold down batten and over the rain deflectors to limit entry of foreign particles into the trough.

8. A hopper vehicle being provided with a hatch defined by longitudinally extending laterally spaced apart coaming portions,

a transverse trough connecting with said coaming portions and being provided with transverse walls spaced apart from one another to define a trough area,

aperture means in each coaming portion above the bottom of the trough area to divert particles from the trough,

a pair of roof hatch covers adapted for placement in end-to-end relation with respect to one another and each having cover end sections spaced apart and extendable over the trough area and having underside weather stripping engageable with the top edge of respective wall section of the trough and the coaming portion to provide for sealing of the interior of the hopper from foreign particles.

9. The invention according to Claim 8, and said cover end sections having upright foreign particle deflectors spaced apart from one another.

10. The invention according to Claim 8, and hold down batten means pivotally connected with the roof and extending over and about the rain deflectors to define a continuous enclosure with the trough area preventing entrance of foreign particles into the trough area.

11. A hopper vehicle being provided with a hatch defined by longitudinally extending laterally spaced apart coaming portions,

a transverse trough connecting with said coaming portions and being provided with transverse walls spaced apart from one another to define a trough area,

aperture means in each coaming portion to divert particles from the trough,

a pair of roof hatch covers adapted for placement in end-to-end relation with respect to one another and each having cover end sections spaced apart and extendable over the trough area and having underside weather stripping engageable with the top edge of respective wall section of the trough to provide for sealing of the interior of the hopper from foreign particles,

said cover end sections having upright foreign particle deflectors spaced apart from one another,

hold down batten means pivotally connected with the roof and extending over and about the rain deflectors to define a continuous enclosure with the trough area preventing entrance of foreign particles into the trough area.

12. A hopper vehicle being provided with a hatch defined by longitudinally extending laterally spaced apart coaming portions,

a transverse trough connecting with said coaming portions and being provided with transverse walls spaced apart from one another to define a trough area,

aperture means in each coaming portion to divert particles from the trough,

a pair of roof hatch covers adapted for placement in end-to-end relation with respect to one another and each having cover end sections spaced apart and extendable over the trough area and having underside weather stripping engageable with the top edge of respective wall section of the trough to provide for sealing of the interior of the hopper from foreign particles,

said cover end sections having upright foreign particle deflectors spaced apart from one another,

hold down batten means pivotally connected with the roof and extending over and about the rain deflectors to define a continuous enclosure with the trough area preventing entrance of foreign particles into the trough area,

U-shaped side baffle means mounted on the batten means at its pivotal juncture with the hopper roof and an end baffle on the batten to deflect entrance of foreign particles into the trough area.