Dec. 9, 1958 B. H. FORD 2,863,402

WEDGE SEALING OF CAR DOORS

Filed May 29, 1956

Fig. 1

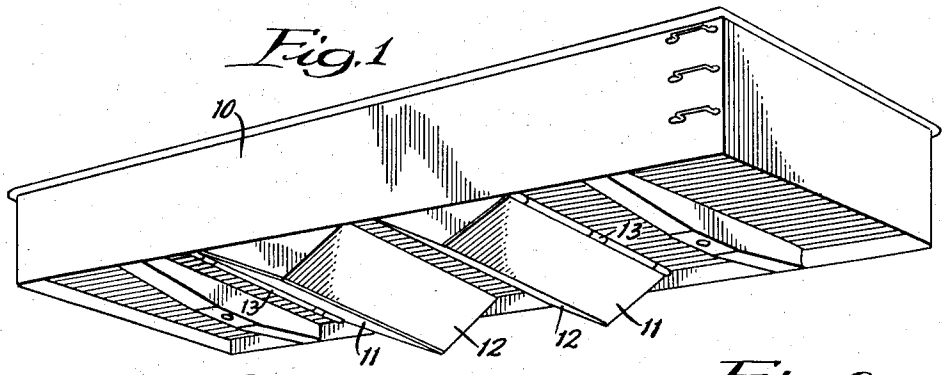


Fig. 2

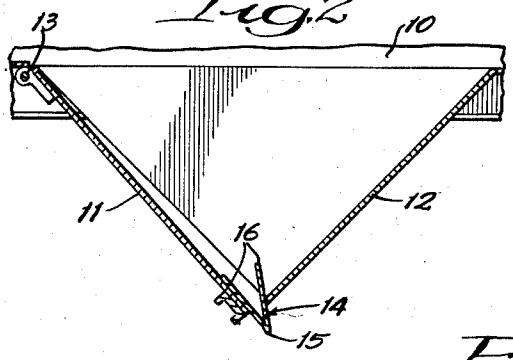


Fig. 3

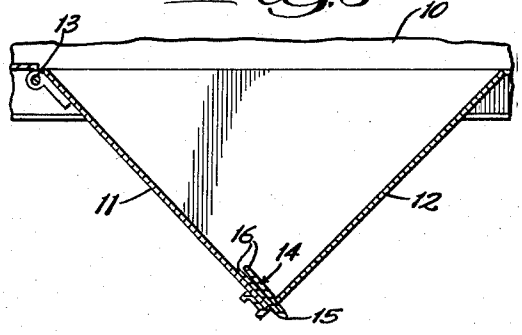


Fig. 4

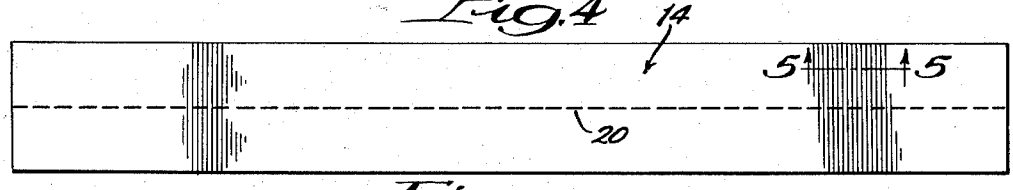


Fig. 5

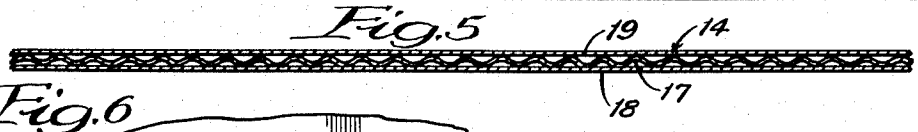
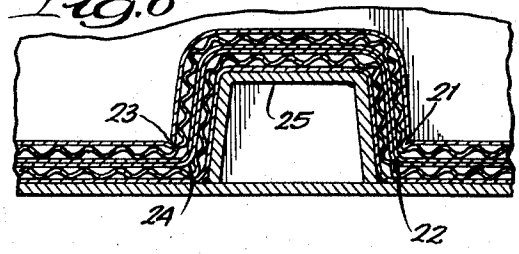


Fig. 6



INVENTOR:
Barton H. Ford,

BY Dawson, Tilton & Graham,
ATTORNEYS.

United States Patent Office 2,863,402 Patented Dec. 9, 1958

2,863,402

WEDGE SEALING OF CAR DOORS

Barton H. Ford, Omaha, Nebr.

Application May 29, 1956, Serial No. 588,031

3 Claims. (Cl. 105—424)

This invention relates to the wedge sealing of car doors, and more particularly to the sealing of drop-bottom doors employed with gondola cars, and the like, which carry granular commodities.

The sealing of drop-bottom doors on railway cars such as gondola cars, hopper cars, etc., to prevent the loss of granular or flowing materials, has long presented a problem. The car doors and frames cooperating therewith are subjected to hard usage and uneven surfaces occur about the edges of the door and frame which are not effectively sealed by simply closing the door. Attempts to seal the space between the door and the frame, or between two doors, are unsatisfactory because any sealing material tends to drop from the door and while the operator is working at one side of the door edge, the material placed in the other side drops away. Even after the tedious operation of getting the packing material in place, it is found that the packing often becomes dislodged during transit and valuable cargo material is lost.

An object of the present invention is to provide an extremely simple method and means whereby sealing is accomplished in a certain manner and with a minimum of effort while at the same time the sealing material is held against dislodgement during transit. Another object is to provide, in combination with the drop-door of a car, a resilient sealing wedge having wings which lock the wedge in position, while at the same time yielding under pressure during the sealing operation. Yet another object is to provide, in combination with drop-doors, sealing wedges effective for sealing not only the bottom edge portion of the door, but also the side edge portions to effect a complete seal about the moving edge portions of the door. Other specific objects and advantages will appear as the specification proceeds.

The invention is shown, in illustrative embodiments, by the accompanying drawing, in which—

Figure 1 is a perspective view of a car equipped with drop-bottom doors with which my invention is employed; Fig. 2, an enlarged sectional view showing a hinged door and a sealing wedge placed between the door and the door frame when the door is in partially and almost closed position; Fig. 3, a view similar to Fig. 2 but showing the door moved to closed position and the compressing of the sealing wedge; Fig. 4, a longitudinal view of the sealing wedge showing the central longitudinal scoring therein; Fig. 5, a side edge view of the wedge shown in Fig. 4; and Fig. 6, a broken sectional view showing how the wedge may be provided with an intermediate recess for the receiving of a channel bar, or other obstruction.

In the illustration given, **10** designates a railway car bed provided at its bottom with hinged door panels **11**. The door panels cooperate with a fixed V-shaped frame **12** to provide inclined chutes through which granular material may be discharged into conduits below the car. It will be understood that hopper or gondola cars are of a great many types and different constructions, and may provide hinged doors cooperating with frames or other

hinged doors for controlling the flow of granular material from the cars. The car indicated by the numeral **10** is merely set out as an example of drop-bottom cars or cars equipped with doors, and it will be understood that the invention as set out herein is applicable to various types of drop-bottom cars or other door panel-controlled vehicles.

In the specific illustration given, the door panel **11** is hinged upon hinge rod **13**, and suitable mechanism (not shown) is provided for the swinging of the door to open and closed positions. In the actual structures, gear-operated mechanism and other mechanism is provided for the swinging of the door to open and closed positions, but since such mechanism is well known, a description herein is believed unnecessary.

In the specific illustration given, it will be noted that there are three side edges to be sealed. There is the transverse bottom edge of the door **11** which is to be sealed, and there are the side edges of the door **11** which are to be sealed. For each of these edges, I provide a resilient wedge **14** which is V-shaped and which is bent upon itself to provide a point **15** and resilient side wings **16**, the structure being such that the side wings are normally urged laterally to the positions illustrated best in Fig. 2.

I have found that a very satisfactory and effective wedge can be provided by utilizing corrugated paper, as illustrated in Figs. 4 and 5. The paper comprises a central core **17**, with the fluting running transversely of the strip, and with an outer liner **18** and an inner paper liner **19**. The strip is scored along a central longitudinal line, indicated by the numeral **20** in Fig. 4, the scoring being effected preferably by running a scoring wheel along the border so as to crush the inner core **17** along the score line, the outer and inner liners **18** and **19** being left intact. The resulting structure is strong and the tension of the liners constantly urges the wings **16** of the wedge **14** outwardly. At the same time, the board is compressible to bring about a sealing function in that the inner core **17** will collapse under pressure in its final sealing operation, while the uncrushed portions of the wedge body **14** remain extended to form a seal about the crushed portion of the board.

While the board **14** is shown scored along the central line **20**, it may also be scored at other points, as illustrated at **21** and **22** and **23** and **24** in Fig. 6, to provide a U-shaped portion for receiving a channel bar **25** or other metal obstruction located upon a door or other frame member. In other words, the board **14** may be scored at any points along its length so as to form channels for receiving reinforcing or support elements such as channel bars, so that the wedge can effectively be used irrespective of such obstructions. The score lines indicated by the numerals **21** to **24**, inclusive, may be increased by providing score lines at the upper portions of the structure shown in Fig. 6 so as to form a tight fit about the channel bar or other reinforcing element of the door or frame.

Operation

In the operation of the structure, the door **11** is preferably moved to a partially closed position, as illustrated in Fig. 2, and while the door is in this position, the wedge members **14** are extended in position so as to lie between the door and the adjacent frame. While I have shown the wedge in the lower, transverse position, it will be understood that similar wedges are extended between the side edges of the door and the adjacent frame. By employing a compressible wedge, it is found that the wedge may be inserted into position with the point **15** extending through the opening while the wings retain the wedge in position, and such insertion into position

may be accomplished either from the inside of the door or from the outside. In other words, the operator can compress the wings **16** together so that they clear the space between the door and the frame, and after the wedge is inside, can release them to leave them in the position shown in Fig. 2. After the wedges are in position so as to cover the bottom transverse edge of the door and also the side edges of the door, the door may be moved to closed position to effect the seal, as shown in Fig. 3. In this position, the immediate portions of the wedge engaging the door and frame are compressed, and their inner core portions yield under such pressure, while the adjacent portions of the wedge which are not under compression, remain in their expanded condition so that a very tight seal is formed, preventing escape of fine granular or flowing material. In spite of irregularities, bends, and notches in the frame and door, it is found that the wedge structure provides a highly effective seal, while at the same time the wedge, by reason of its spring arms, can be readily inserted in position and will remain in position by reason of its springy characteristic while the operator effects the final closing of the door.

While the sealing wedge is illustrated herein in connection with a specific form of structure, it will be understood that such a wedge, with its point and spring wings, may be utilized as effectively in the sealing of other types of closures, etc.

While, in the foregoing specification, I have set forth a specific structure in considerable detail for the purpose of illustrating embodiments of the invention, it will be understood that such details may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In combination with a drop-bottom car adapted for the handling of granular commodities, said car having a stationary door frame panel, a pair of side walls, and a hinged door panel cooperating therewith to form a downwardly-directed, bottom-openable V-shaped chamber, an elongated sealing wedge member having a compressible core included between outer liners, the core being compressed along a longitudinal line to form a pair of wings disposed in V relation, said compressed core and outer liner cooperating to resiliently urge said wings apart, said wedge member having its V-point extending downwardly and outwardly between said panels and removably lodged therebetween.

2. The structure of claim 1, in which the said wedge member is formed of corrugated paper with the flutes thereof running transversely of the wedge.

3. In combination with a drop-bottom car adapted for the handling of granular commodities, said car having a hopper defined by a stationary door frame panel, generally triangular side walls, and a hinged door panel cooperating therewith to form a downwardly-directed, bottom-openable V-shaped chamber, the inner face of said door panel adapted to abut an edge of said frame panel, an elongated sealing wedge member formed of corrugated board having inner and outer liners and a crushable core therebetween with the flutes thereof running transversely of the wedge, the core being compressed along a longitudinal line to form a pair of wings disposed in a V relation and resiliently urged apart, said wedge member having its V-point extending outwardly downwardly between said panels and removably lodged therebetween and with one of said wings bearing against the inside face of the said door panel.

References Cited in the file of this patent

UNITED STATES PATENTS

513,302	Canda	Jan. 23, 1894
936,235	Clay	Oct. 5, 1909
1,014,768	Meissner	Jan. 16, 1912
1,882,186	Hankins	Oct. 11, 1932
1,955,868	Wine	Apr. 24, 1934
2,602,402	Sanford, Jr. et al.	July 8, 1952
2,608,728	Montgomery	Sept. 2, 1952
2,756,468	Bright	July 31, 1956
2,778,072	Palisca	Jan. 22, 1957