June 16, 1959 G. T. MURPHY 2,890,747

CAR LOADING RETAINING STRIP AND LOCK THEREFOR

Filed June 21, 1954 4 Sheets-Sheet 1

Fig. 1.

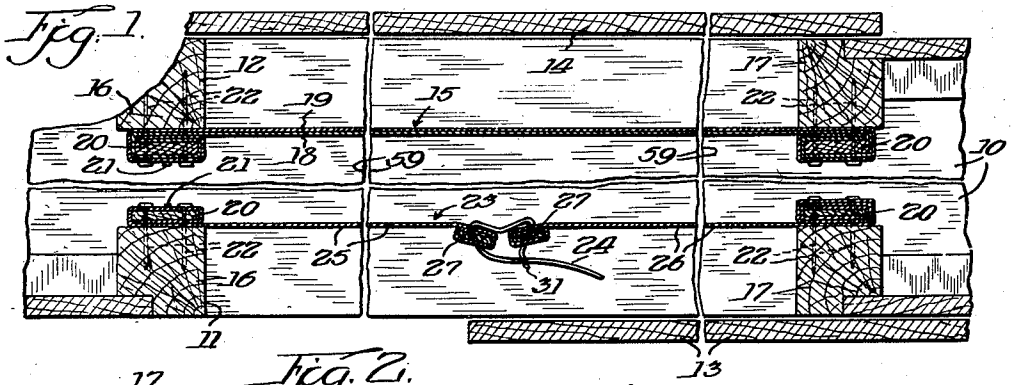


Fig. 2.

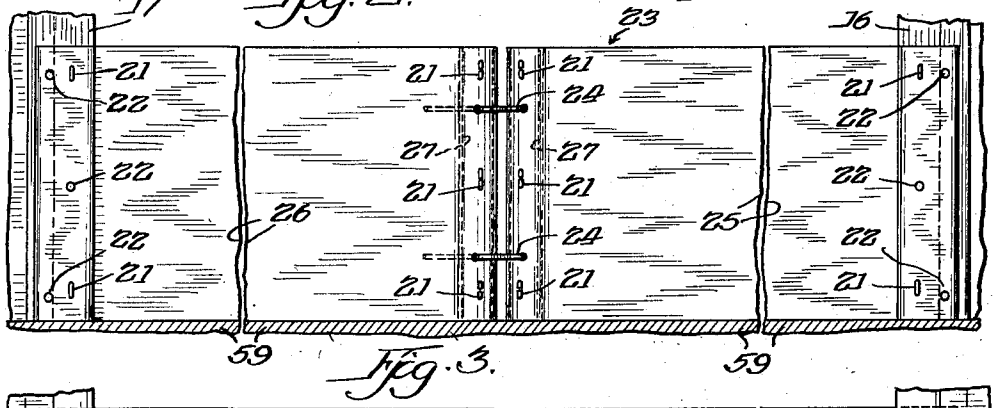
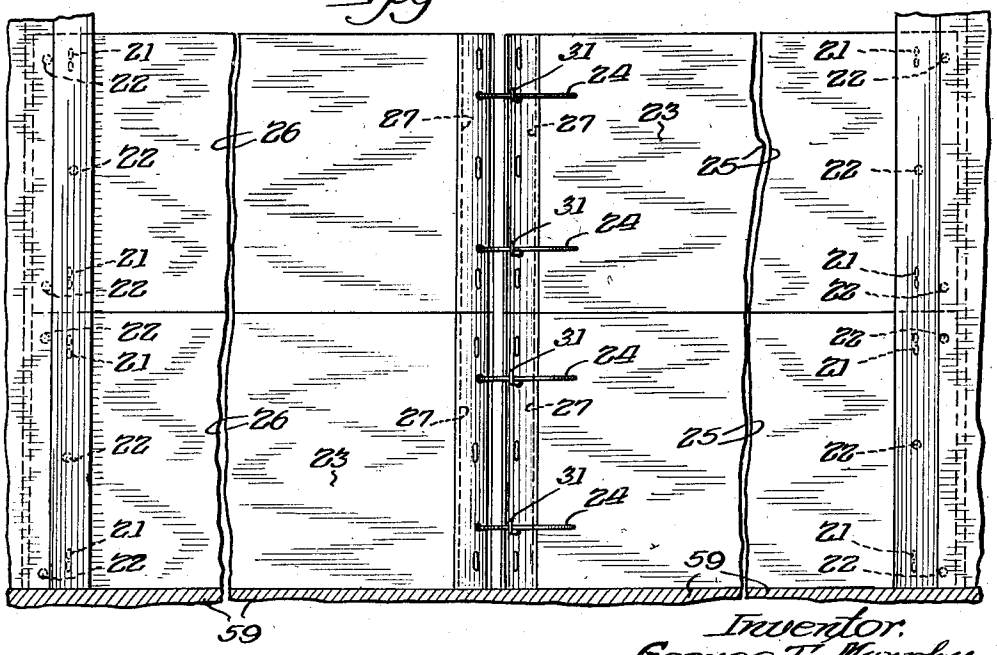


Fig. 3.



Inventor.
George T. Murphy.
By. Lee & Lee Attys.

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CAR LOADING RETAINING STRIP AND LOCK THEREFOR

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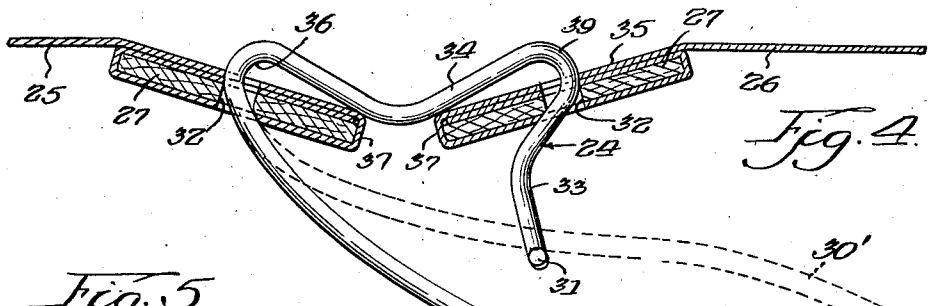


Fig. 4.

Fig. 5.

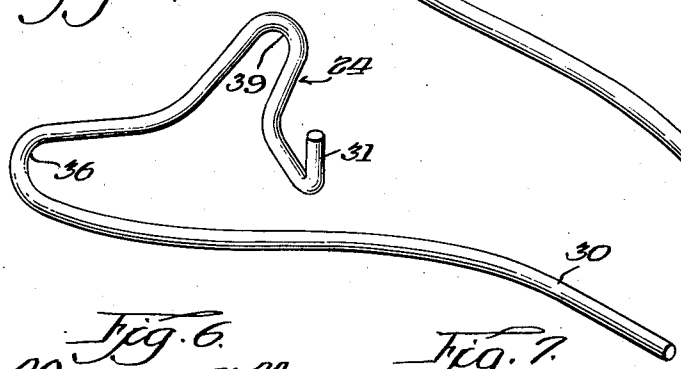


Fig. 6.

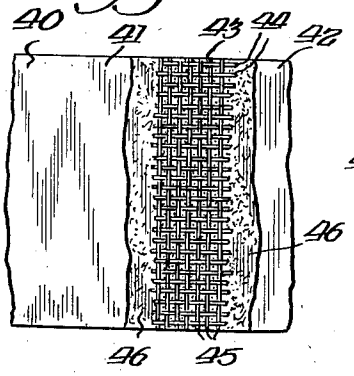


Fig. 7.

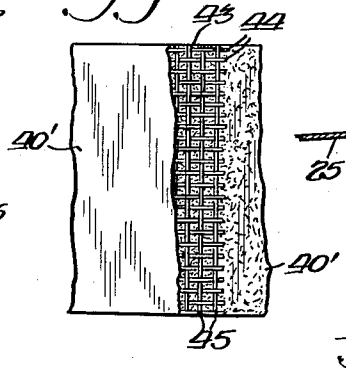


Fig. 9.

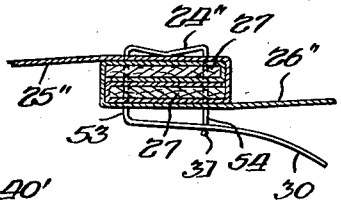
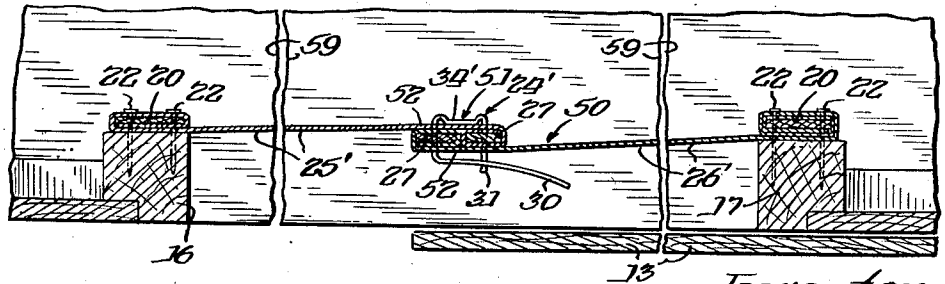


Fig. 8.



Inventor.
George T. Murphy.
By Lee & Lee Attys

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CAR LOADING RETAINING STRIP AND LOCK THEREFOR

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Fig. 10.

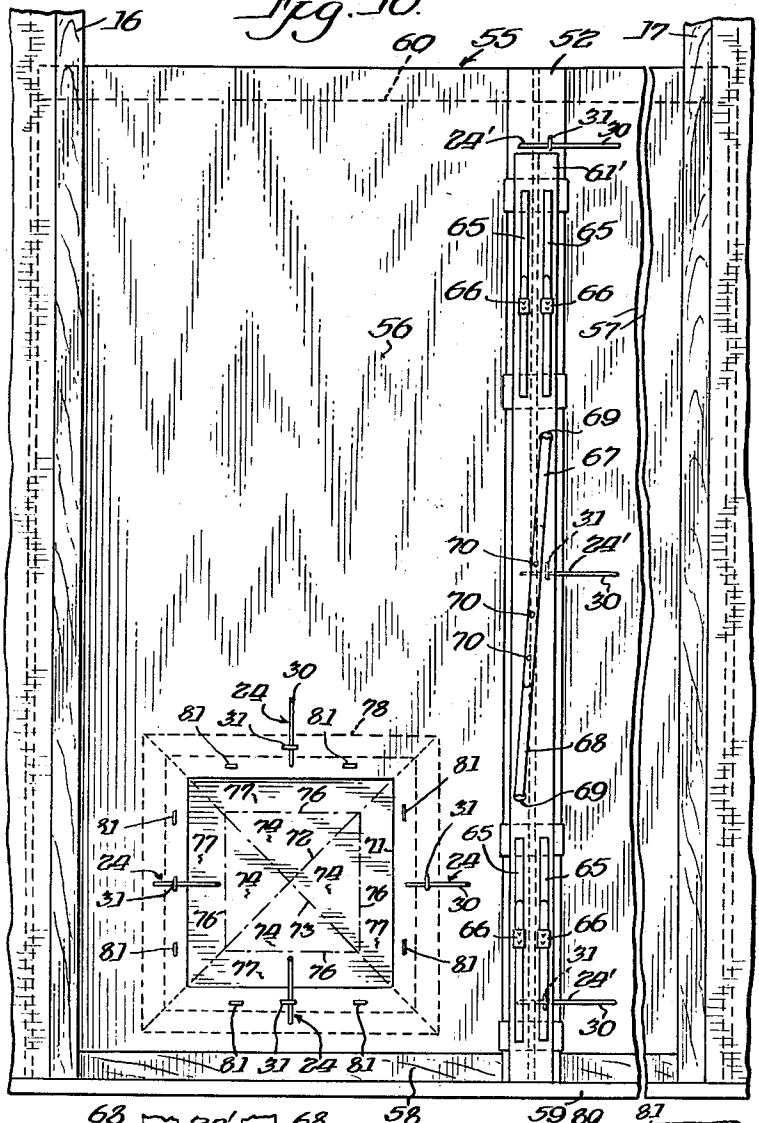


Fig. 12.

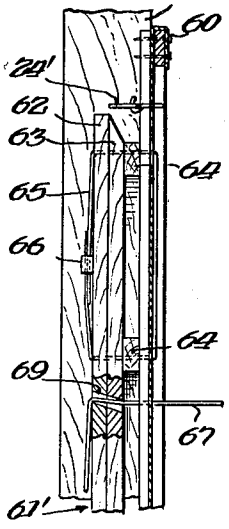


Fig. 13.

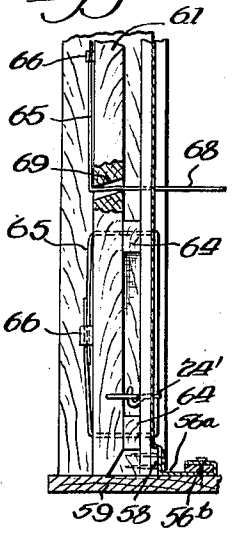
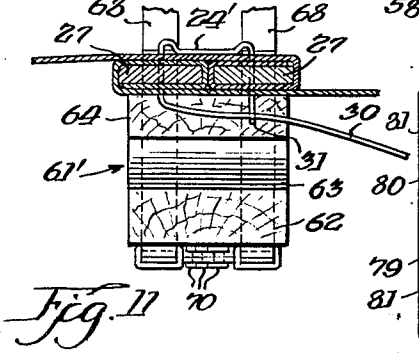


Fig. 11



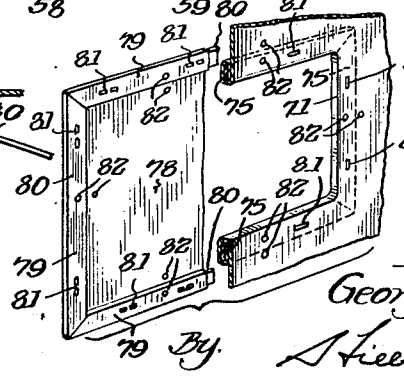


Fig. 14.

Inventor.
George T. Murphy.
By. Hiee & Hiee Attys.

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CAR LOADING RETAINING STRIP AND LOCK THEREFOR

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Fig. 15.

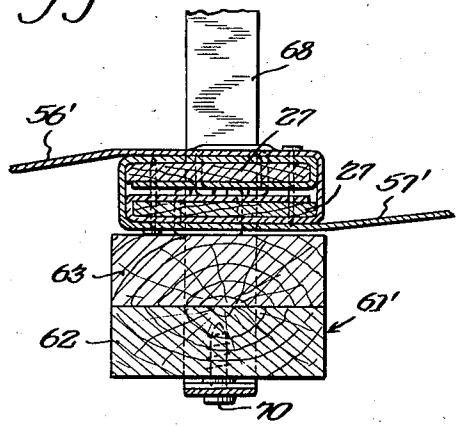


Fig. 16.

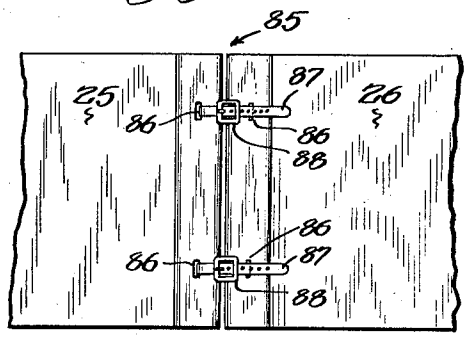


Fig. 17.

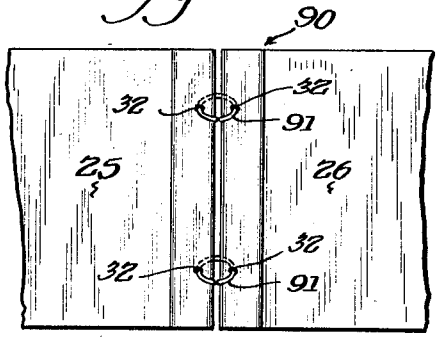


Fig. 18.

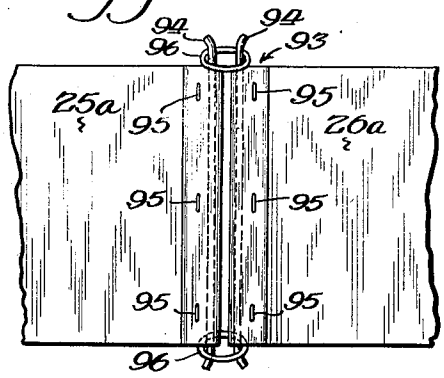


Fig. 19.

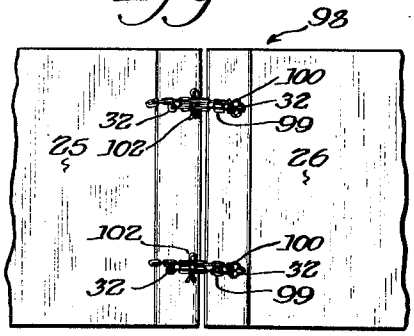
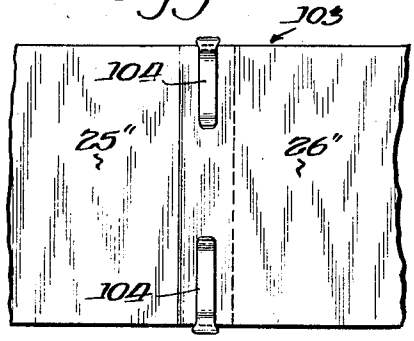


Fig. 20.



Inventor.
George T. Murphy.
By. Lee & Lee
Attys.

United States Patent Office

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Patented June 16, 1959

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CAR LOADING RETAINING STRIP AND LOCK THEREFOR

George T. Murphy, Melrose Park, Ill., assignor to A. J. Gerrard & Company, Melrose Park, Ill., a corporation of Illinois

Application June 21, 1954, Serial No. 438,026

7 Claims. (Cl. 160—368)

This invention relates generally to closure structures for railway cars and the like, and more particularly to a novel carloading retaining strip and lock therefor.

The present invention is directed to a closure construction for use on car doors and the like wherein the closure structure comprises suitable sheets of high strength, sheet-like material which are extended across the respective doorways at opposite sides of a railway car for use in the shipment of packages, and are primarily for the prevention of damage to the lading or package commodities from sliding in transit against the car doors because of lateral movement of packages in shipment if they should become displaced through the car movement.

The present invention has among its objects the production of a carloading retaining strip for use in coopering a freight car which may be completely placed across one of the doors, and a separable retaining strip which is used for the doorway of the car by which the car is loaded and unloaded.

Another object of the invention is to provide a retaining strip structure for partially closing oppositely disposed doorways of a freight car, one of which extends completely across a respective doorway while the other is separable intermediate the car door structure.

Still another object of the invention is to provide a retaining strip structure formed from relatively flexible laminated sheet material, comprising a pair of outer plies and an inner ply of interwoven strands of glass fiber and adapted to be secured contiguous its side edges to the doorway of a freight car or other vehicle used in the transfer of packaged commodities.

Still another object of the invention is to provide a pair of relatively rigid strips for each end of said retaining strips about which the respective side edge portions of the retaining strip structure are wrapped together with means for securing each of said sheets to their respective side strips.

Another object of the invention is to provide a retaining strip structure to permit the rolling thereof upon a rigid strip for the end of said structure to reduce or increase the effective width of the retaining strip structure to permit the rigid strips to be operatively secured to doorways of lesser or greater width.

Still another object of the invention is to provide improved forms of securing means operatively affixed to contiguous edges of separable retaining strips for detachably securing the separable retaining strips together.

Another object of the invention is to provide an improved form of sheet-like material for fabricating flexible closure structures for railway car door openings or other bulk loading openings.

A still further object is to provide an improved retaining strip for packaged carload shipments which will give protection so that there may be had solid doorway loading of packaged products, such as cartons, bags, boxes and other forms of packaged products without damage to the car door or packaged products.

Still another object of the invention is to provide retaining strips for doorway loading without requiring the use of liners across doorways, and also to reduce dunnage since it is not necessary to rely on heavy doorway barricades and the like.

A still further object is to provide a retaining strip which permits the railway car door to be readily opened and, after the door is opened, to provide quick unloading since the retaining strips may be readily separated or unlatched manually.

Still another object of the invention is to provide a retaining strip which may be readily fitted to any standard railway car door, and which is simple to apply with ordinary hammer and nails.

A further object of the invention is to provide a closure structure which is disposable and is substantially injury proof to personnel handling and erection of the closure structure.

A particular feature of the invention is to provide a retaining strip or flexible closure structure for railway car doors and the like fabricated from one or more sheets of either laminated sheet material with an intermediate "Fiberglas" scrim or from sheets felted from a paper slurry simultaneously on opposite side of a "Fiberglas" scrim.

Another feature of the invention is to provide a retaining strip for a railway car door formed from separable portions secured together with an improved form of latching means to permit the detachment of the retaining strip for unloading of the railway car, and in which the retaining strips are preferably mounted horizontally and may be abutted, overlapped or spread apart, depending on the weight and characteristics of the load.

Another feature of the invention is to provide various forms of detachable securing means for detachably affixing contiguous edge portions of separable retaining strips.

Still another feature of the invention is to provide a detachable latch which permits contiguous edges of a retaining strip to be secured together but spaced a slight distance apart, and which will not become opened by the movement of the car door and yet may be readily unlatched at the destination at which unloading takes place.

Still another feature of the invention is to provide an improved carloading retaining strip, which may be formed from one or more strips of reinforced paper or the like material, depending upon the load of the packaged or bulk commodity retained by the carloading retaining strip.

In accomplishing the various objects and features of my invention, it is preferred to use a material for the carloading retaining strip of the type such as that disclosed and claimed in the co-pending application of John M. Gerrard et al., Serial No. 350,544, filed April 23, 1953, for Grain Door for Railway Car, now Patent 2,803,299, issued August 20, 1957, and also an improved form of material which is felted from a suitable high strength paper slurry directly to both sides of a scrim of glass fibers having longitudinally and transversely extending strands of glass fibers. Either of these high strength papers is cut to the preferred size for carloading retaining strips or grain door or other bulk car door structures, and have the opposite ends wrapped about a suitable reinforcing member, one end of which may be affixed to the car door, and if the material is used for carloading retaining strips, the contiguous edges are affixed together with a suitable latching means extending through the reinforced edges of the strip as formed by wrapping an edge about a suitable vertical member of plywood or other material. The latching means may take one or more of the forms as will be described later, but preferably in the form of a latch fabricated from high carbon wire and heat treated, and of sufficient resiliency that it may be readily latched and unlatched by hand. If it is desired to have a car-

loading retaining strip for packaged commodities or for bulk commodities, such as grain and chemical material which requires greater retaining strength than that provided by one strip of the fabricated sheet-like material, it is within the scope of the invention to use one, two, three or more strips, depending upon the load to be retained across an open car door area. It is also within the scope of the invention to provide not only the separable carloading retaining strips for bulk commodities but also a separable form of retaining strip for bulk commodities, such as grain products and malt, chemicals and minerals, which is overlapped at the joint to provide a suitable seal for this type of material, and which has an intermediate center supporting member at the overlapped joint, and in which the supporting structures are restrained in their outward movement by the pressure of the bulk material by cross ties connecting the opposite supporting door structures placed in the car door openings.

Many other objects and advantages of the construction herein shown and described will be obvious to those skilled in the art from the disclosure herein given.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described, and more particularly pointed out in the claims.

In the drawings, wherein like reference characters indicate like or corresponding parts:

Fig. 1 is a plan view of carloading retaining strips applied to opposite railway car door openings;

Fig. 2 is a vertical elevational view from within the railway car and partly in section, illustrating a retaining strip as applied to one door of the railway car of Fig. 1;

Fig. 3 illustrates retaining strips abutted together and applied as in Figs. 1 and 2 but viewed from outside the railway car;

Fig. 4 is an enlarged plan view, partly in section, illustrating the latching means for the retaining strip portions in the unlatched and latched positions thereof;

Fig. 5 is a perspective view of the latching means or lock for carloading retaining strips;

Fig. 6 is a portion of a carloading retaining strip, illustrating the reinforcing "Fiberglas" scrim laminated between opposite sheets to form the reinforced retaining strip;

Fig. 7 is an improved form of retaining strip material in which the paper slurry forming the sheet-like material is felted to opposite sides of a reinforcing "Fiberglas" scrim sheet;

Fig. 8 is an embodiment of a carloading retaining strip in which the joint between the separable portions is formed by overlapping to provide a sealed joint;

Fig. 9 is a plan view, partly in section, of another modification of an overlapped joint to provide a seal between the separable portions of a carloading retaining strip;

Fig. 10 is a view in vertical elevation, looking from the outside of a railway car, of a grain door and the like for bulk loading of railway cars in which the door structure is formed from separable retaining strips overlapped and sealed, and provided with latching means to detach the separable portions;

Fig. 11 is a plan view illustrating the vertical supporting structure for the overlapped joint of the separable strips forming the grain door structure;

Fig. 12 is a vertical view, partly in section, illustrating the harness structure and in which the vertical support is formed by a prefabricated member;

Fig. 13 is a vertical view partly in section, illustrating a modified form of the harness structure in which the vertical support is formed from a single member;

Fig. 14 is an exploded view, partly in section, illustrating in perspective the opening in the grain door and the closure therefor;

Fig. 15 is an enlarged plan view of a slightly modified grain door structure from that of Figs. 10 and 12, taken at the joint therebetween;

Fig. 16 is a vertical view of another form of securing means for the connection between contiguous portions of a carloading retaining strip;

Fig. 17 is another form of securing means at the juncture of contiguous portions of a retaining strip;

Fig. 18 is still another form of securing means for the juncture between contiguous portions of a modified form of retaining strip;

Fig. 19 is still another embodiment of securing means in the form of a chain connection for securing together contiguous portions of a retaining strip; and

Fig. 20 is another embodiment of securing means for affixing together overlapped portions of a retaining strip at the juncture thereof to provide a sealed joint therebetween.

Referring to Figs. 1 through 5, a preferred form of carloading retaining strip and latching means or lock therefor for affixing together the contiguous portions will be described. A conventional railway car construction **10** having opposite doorways **11** and **12** adapted to be closed by doors **13** and **14**, and which for the purpose of the disclosure of this invention the opening **12** shall be considered as being closed by the door **13**, and either the loading or unloading of the car shall take place through the opening **11**, after which the sliding car door **13** therefor will be closed upon completion of the loading. In applying the carloading retaining strips for packaged commodities, it is preferred to first apply a retaining strip or laminated construction **15** which extends across the opening **12** formed by the vertical parts or jambs **16** and **17**. Although the carloading strip of this invention may be formed from a single fabricated member **18** of sheet-like material, the retaining strip may also be formed from multiple layers of two or more strips **18** and **19** as illustrated in Fig. 1. It is also within the scope of the invention that the number of plies used depends upon the lateral force of the packaged commodities set up in transit or lateral force of bulk commodities to be restrained at the doorway of a railway car. As the width of railway car doors vary from six to eight feet, it is preferred to fabricate the length of the sheet **18** such that one size will do for the various widths of car door openings. However, if necessary the length of the sheets may be adjusted to take a certain range of door sizes, and another size retaining strip may be utilized for the balance of the range of car door widths. In order to wrap the retaining strip **18** or strips **18** and **19** at the ends for securing the ends of the retaining strip or strips to the jambs of the doorway, a ⅛" x 18" plywood nailing strip **20**, 4" wide is utilized, about which the ends of the strip are wrapped as illustrated in Fig. 1. It is preferred to have at least a minimum of three plies of the sheet or sheets wrapped, as shown in the left-hand side of Fig. 1, and these may be affixed in place by staples **21**. The opposite edge of the strip **18** or strips **18** and **19**, depending upon the number of plies being used, is also similarly wrapped about another plywood nailing strip **20**. The number of plies wrapped about the strip **20** is preferably three, as illustrated on the left-hand side, but may be a larger number, depending upon whether the length of the retaining strip is made for a particular door width or to fit one or more door widths. The retaining strip, as it is wrapped at the edges, is then erected to the door jambs by random nailing with suitable nails **22** or other form of securing means, such as staples applied with a stapling machine and the like. If the retaining strip is made for multiple widths of car doorways, the other end of the strip is then unwrapped to the point at which the proper width of the doorway is had, and the strip is then nailed in position. If, however, the retaining strip is made to the proper width of door to which it is applied, both ends of the retaining strip are wrapped as described with the left hand side of Fig. 1 and stapled with staples **21**.

After the erection of the retaining strip of one or more

plies for the doorway opposite the door through which the commodities are loaded, the retaining strip structure **23** including the latching means **24** therefor is then applied after the packaged commodities are nearly loaded, or it may be applied prior to the completion of the loading with the separable portions **25** and **26** unlatched and later latched upon completion of the loading. Usually it is preferred to assemble the retaining strip in position prior to loading since the strips are only 18" high and can be easily stepped over, and if it is desired to build additional doorway protection, depending upon the height of the packaged commodities, this may be done as the loading proceeds. However, it is usually preferred to erect the retaining strips needed for the doorway, which is not unopened at the beginning of the coopering. The retaining structure **23** is illustrated as being formed of a single ply of sheet-like material, though it is within the scope of the invention that one or more plies may be used for each portion of the completed retaining strip structure, as described above with respect to the unopened doorway. Since the free ends of the portions **25** and **26** which are affixed to the door jambs **16** and **17** are the same as described with reference to the retaining strip for the unopened doorway, like reference characters are used to identify the same or similar parts. Since it is desired to provide a retaining strip which may be formed of separable portions **25** and **26** and may be readily separated by detaching the latching means **24** from the exterior of the car after the car door **13** has been opened, it is necessary to provide sufficiently rigid edges for the contiguous ends of the respective portions **25** and **26**. This is accomplished by wrapping each edge of the portions **25** and **26** about a ⅛" x 18" plywood strip **27**, as illustrated in Fig. 1. The wrapped plies of the retaining strip portions are affixed to the plywood strip by staples **21**, in a similar manner as are the strips for the outer ends of the retaining strip portions.

Referring to Fig. 3, there are illustrated retaining strips erected in abutting relationship. As the strips are constructed as described with reference to Figs. 1 and 2, further description is unnecessary as the lower strip is first erected, after which the upper strip is erected. It is also within the scope of the invention as is well understood in the art that the retaining strips may be overlapped or spaced apart, depending upon the weight and characteristics of the packaged carload shipment.

In detaching the strips, whether the doorway has the strips applied in abutting, overlapping, or spaced relationship, the latch members **24** for each of the strips are unlatched by raising the handle portion **30** upwardly to clear the vertically extending latch **31** to the point that it clears and is then free to swing outwardly from the dotted position **30'** of Fig. 4 to the opened position **30"**. The latches may then be removed by first manipulating the reinforced portion of the strip **25** so that the handle portion **30** may be pulled through its respective hole **32**. After the handle has cleared the hole **32** by manipulation of the latch, the deformed portion **33** may be pulled through a corresponding hole **32** of the retaining strip portion **26** and further manipulation will permit the upstanding vertical end **31** to be pulled through the opening after the handle is pulled downwardly substantially flush alongside the face of the retaining strip portion. In this manner, the latches **24** may be reclaimed for further use. With the latches removed, the retaining strips may be folded or rolled upon themselves to the edge of the car door opening to permit unloading of the railway car. Afterwards, the retaining strips may be detached by removing the nails **22** and, if care is used in salvaging, even the retaining strip portions may be reclaimed and reused if they have not been pierced in any manner during the shipment. Although it is preferred to use single-headed nails **22** as illustrated, if the type of shipment permits the use of double-headed nails, it is within the scope of the invention that double-headed nails may be used but there is the tendency with double-headed nails to cause damage to the cartons of the packaged shipments.

Referring to Figs. 1, 4 and 5, when the retaining strips are fabricated to be used at the place of loading the shipment, it is preferred that the portions **25** and **26** of a completed retaining strip **23** shall be assembled complete with the latches **24** in place, and so rolled that a neat and compact bundle is had together with the opposite retaining strip **15** which is for the opposite doorway at which the loading and unloading takes place. It is also within the scope of the invention that if the shipper requires separable retaining strips for each doorway, these may be furnished. Usually, however, it is designated which door of the car is to be used for loading and unloading.

When the retaining strips are used in this manner, the latches **24** are assembled in place as shown in Figs. 1 and 4. To assemble these latches in position, the latch end **31** is first inserted through its respective hole **32** and in this position the V-shaped portion **34** is substantially flush against the back face **35** with the curved portion **36** of the latch abutting the edge **37** of the strip and with this portion of the latch above the hole, and the handle portion **30** extends across the front face **38** of the reinforced edge of the retaining strip portion, and the handle extends downwardly. Upon raising the handle portion upwardly, the portion **33** extends through the hole, and upon movement of the handle in a clockwise direction in a plane, at right angles to the plane of the retaining strip, the U-shaped portion **39** extends within the hole. The opposite reinforced edge of the retaining strip **35** is then manipulated so that the end of the handle **30** extends through its respective hole **32** and the handle is pulled through until the U-shaped portion **36** engages the hole **32**. The latch may then be locked by manipulating the handle over the top of the latch **31** and pulled downwardly into position to be latched in place behind the upstanding latch member **31**. It is preferred to fabricate these latch members out of the suitable wire, such as 10-gage wire, having a preferred carbon content within a range of 1065–1075, so that they may be heat treated to provide a resilient latch which will be kept in its latched position at all times. When both latches for each retaining strip are in place, as shown in Figs. 1, 2 and 4, with the retaining strips erected in place across a car doorway, the reinforced contiguous edges of the retaining strip portions **25** and **26** are canted at an angle as shown. This is caused by the position of the V-shaped portion **34** of the latch as it engages the edges **37** of each reinforced edge, and by the location of the holes and the engagement of the U-shaped portions **36** and **39** with the holes. This inclination of the reinforced portions tends to give greater rigidity to the joint and also if the retaining strips are erected in position and latched afterwards, there is a tendency to place tension upon the strip portions as the latch is locked in position. It is preferred, however, as described above, to erect the latches **24** in position, after which they are bundled for shipment or, if desired, the retaining strip portions may be shipped separately and the latches therefor shipped separately, after which they can be assembled as described on the job, and then the assembled strip **23** with the latches in position erected across the car doorway as described above.

Referring to Figs. 6 and 7, there is illustrated two embodiments of the reinforced paper from which it is preferred to fabricate the retaining strips. It is preferred to provide this improved form of retaining strip from a glass strand reinforced paper. In the embodiment of Fig. 6, it is preferred to use a kraft sheet of substantially 170 pounds per ream weight when based on 500 sheets of paper 24" x 36". The thickness of the paper is preferably 0.023" or 23 point paper. Although it is preferred to use a kraft type paper, the sheet **40** may also be fabri-

cated from other forms of suitable material such as paper, cellophane or plastic sheets, though it is preferred to use the 23 point plies or sheets **41** and **42** with the intermediate ply **43** constructed in the form of two series of interwoven strands having a series of horizontal strands **44** and a series of vertical strands **45**. The strands **44** and **45** may be of any suitable material having the desired characteristics of flexibility, tensile strength, etc. to achieve the desired results. In the construction illustrated the sheets **41** and **42** are secured together by suitable adhesive material **46**, as for example, a combination of asphalt and latex, suitable plastics and the like. It has been found that very satisfactory results may be obtained by constructing the strands **44** and **45** of glass fibers. The fabric formed by such interwoven or crossed strands is commonly known as scrim and is commercially procurable. This particular form of sheet material is disclosed and claimed in the co-pending application of John M. Gerrard et al., Serial No. 350,544, filed April 23, 1953, for Grain Door for Railway Car, now Patent 2,803,299, issued August 20, 1957.

An improved embodiment of this form of material is illustrated in Fig. 7, and is made by felting a suitable kraft pulp simultaneously to both sides of a "Fiberglas" scrim sheet **43** having the horizontal "Fiberglas" strands **44** and the vertical "Fiberglas" strands **45**. This sheet is simultaneously felted on the scrim sheet **43** on a suitable Fourdrinier or Oliver felting machine which has been modified so that the felting operation takes place simultaneously on both sides of the glass scrim sheet **43**. The width of the felted sheet before trimming is 102". This completed sheet material is an improvement over the glass strand reinforced paper fabricated in accordance with the disclosure and claims of Crandall #2,653,090, dated September 22, 1952. The scrim sheet **43** may be treated in the same manner as the individual strands of fiber as disclosed in the aforementioned patent to Crandall. It has been found that a glass scrim identified as 150–1/3–2/2 when woven with a fiber spacing of ½" for the horizontal and vertical strands makes a preferred form of reinforced paper. The 170 pounds basis for 3000 square feet of paper fabricated in this manner has a scrim weight of substantially 38 pounds with a pulp weight of substantially 132 pounds. It has been found that a scrim with the preferred spacing permits the paper fibers to pass through the screen-like scrim to properly imbed and inter-entwine the horizontal and vertical strands of the scrim. It is also to be understood that any arrangement of fiber ends to produce a glass strand of a different number of fibers may be used as is well understood in the art. For example, 150 ends may be made into strands having multiples thereof, such as 300, 450, 600, etc., and in turn the spacing may be at any preferred conventional spacing when the strands are woven into the scrim sheets. However, it is preferred to use a spacing of substantially ½". It is also within the scope of the invention that horizontal strands **44** may be of greater strength than the vertical strands **43**. The sheets from the felting machines after they have been felted and calendered may be cut to the required width, for example, 18" for the retaining strips and length, depending upon the car door width to which they are to be applied. If the completed sheets are to be used for a grain door construction as illustrated in Figs. 10 and 12, the sheets are then fabricated into the sizes required, depending upon whether the sheets are to be fabricated to extend completely across a doorway or of a predetermined size or of a size to fit a series of doorway openings. Likewise, it is to be understood if separable sheets are to be used, the narrower widths, as will be described with reference to Fig. 10, will be used.

Sheet-like material formed in accordance with the disclosure fo the embodiments of Figs. 6 and 7 is substantially four or five times stronger than standard kraft paper. Usually, a single sheet of etiher the embodiment of Fig. 6 or 7 is suitable for fabricating a retaining strip or for a grain car door sheet. However, as the widths of the door opening increase or the load to be retained exerts a greater lateral pressure, it is within the scope of the invention to use multiples of the sheet for the retaining strips or for the grain car door construction. For the most part a maximum of three sheets may be required, assembled into a retaining strip or portions thereof as illustrated in Fig. 1 for an 8' wide door, and the same is also preferably required for grain car doors or the like which have loadings of over 80,000 pounds per car with an 8' wide doorway, and with the grain car door, likewise substantially 8' high. For example, cars loaded with malt sometimes weigh 124,000 pounds when loaded to visible capacity of 13" for clearance.

Referring to Figs. 8 and 9, there are illustrated two embodiments of a carloading retaining strip in which the contiguous reinforced edges are overlapped to provide a reinforced joint and a sealed joint, and yet which may be readily latched for attaching and detaching the contiguous reinforced edge portion. As the carloading retaining strips are fabricated substantially as those described with reference to Figs. 1, 2, 3 and 4, like reference characters will indicate the same or similar structures. However, in the embodiment of Fig. 8, a completed retaining strip assembly **50** has the reinforcing strips **27** and the wrapped ends thereof arranged as illustrated. A modified latch member **51** is similar to the latch member **24** but instead of the V-shaped portion **34** has a flattened portion **34'**. Otherwise the structure is substantially identical. The flattened portion **34'** is to permit the reinforcing strips **27** and the wrapped edges thereof to be held in substantial alignment as illustrated, so that at all times there is a seal formed by the overlapping portion **52** of each of the retaining strip portions **25'** and **26'**. The erection and fabrication of the completed retaining strip is essentially the same as that described with reference to the fabrication and erection of the structure illustrated in Figs. 1, 2 and 4.

In the embodiment of Fig. 9, another form of overlapped and sealed joint between contiguous retaining strip portions **25"** and **26"** is illustrated. The wrapped retaining strips **27** of each portion are arranged as illustrated with the contiguous inner faces of the strips in abutting relationship rather than the edges as illustrated in Fig. 8. Two drilled holes for the legs **53** and **54** of the latch **24"** are formed in the retaining strips to receive them in the same manner as described with reference to the latch construction of Figs. 1 and 8 with the exception that in the previous constructions, each leg went through the contiguous retaining strip, whereas in this embodiment both legs of the latch member go through each retaining strip. The method of assembling this construction is essentially the same as described in the previous latch constructions with the difference, however, that the legs are longer and formed as illustrated in Fig. 9.

Referring to Figs. 10 through 15, there is illustrated an improved form of grain door construction over that of the co-pending application of John M. Gerrard et al., Serial No. 350,544, filed April 23, 1953, for Grain Door for a Railway Car, now Patent 2,803,299, issued August 20, 1957, and the application to John M. Gerrard, Serial No. 397,400, filed December 10, 1953, for Grain Door, now Patent 2,830,659, issued April 15, 1958. This improved construction has incorporated certain of the features of a carload retaining strip as described with reference to Figs. 1 through 9, and also certain of the harness structure as described with reference to that of the previous co-pending applications. In the preferred embodiment, sheet material as described with reference to that illustrated in Fig. 7 is preferred, although it is also within the scope of the invention that sheet material of the type as disclosed with reference to Fig. 6 may be used

as well as other forms, as disclosed and claimed with reference to the disclosure of the co-pending application, Serial No. 350,544, may also be used.

A grain car door **55** as illustrated in Fig. 10 preferably comprises separable sections **56** and **57** which have the edges thereof fabricated as described with respect to the co-pending application, Serial No. 350,544, and which is similar to the wrapped edges as illustrated as described with reference to the carloading retaining strips of Figs. 1 and 2, the difference being that instead of being eighteen inches high, the grain door height begins substantially at six feet and may extend as high as eight feet, depending upon the size of the car door and the amount of bulk material, whether grain or other types of bulk material are being loaded. Likewise, the sections **56** and **57** may have the outer edges so formed that the completed grain car door **55** is adaptable for more than one width of car door. The car door, when fabricated in this manner, may be erected to the door jambs by random nailing with either single or double-headed nails as desired. The inner contiguous edges of the separable sheets **56** and **57** are also formed in the same manner as described with reference to the contiguous edges of the carloading retaining strips, as illustrated in Figs. 1, 8 and 9. In the embodiment illustrated in Figs. 10 and 11, the reinforced edges are wrapped and overlapped as described with reference to Fig. 8. Therefore, like or similar reference characters will describe the joint construction of Figs. 10 and 11 with that of Fig. 8, and a similar type of latch **24'** may be used.

In the erection of a grain door of this type, it is usual first to erect a cross-tie **58** across the bottom of the doorway and abutting the floor **59** of the car. A strip **60** is also erected at the top of the grain car door and similarly secured to the door jambs **16** and **17** as the bottom strip **58**. The strip **58** serves as a pry-board in opening the car door, and the upper strip serves as a reinforcement for the personnel in getting out of the car after it has been coopered.

It is preferred to latch the contiguous abutting inner ends of the strips **56** and **57**, as illustrated in Figs. 10 and 11, and this may be done at the factory or on the job, whichever is desired. A center reinforcing member **61** may be preferably a two inch by two and one-half inch hardwood upright, preferably extending from the floor of the car, and if necessary a cleat, not shown, may be abutted against the lower corner and affixed to the floor, and reinforcing member **61** may be conveniently fabricated from railway tie stock, although it is within the scope of the invention that they may be fabricated from two one inch by three inch strips **62** and **63** suitably secured together, as illustrated in Figs. 11 and 12, when it is impossible to secure the hardwood upright **61** as illustrated in Fig. 13. To affix the uprights, as illustrated in the modifications of Figs. 10, 11, 12, and 13 to the abutting inner ends of the strips **56** and **57**, spacers **64** are placed between the front face **52** of the abutting strips to provide a clearance for the center latching means **24'** and bottom latching means **24'** as illustrated in Figs. 10 and 12. To affix the assembled structure together, as illustrated in Fig. 10, banding or strap iron **65** is assembled through the uprights **61** or **61'** and through the spacers **64** and the reinforcing strips **27** and the contiguous edge wrapping of the sheets **56** and **57**. The banding iron straps **65** are then properly tensioned and sealed with seals **66** as is customary with the usual strapping tools and sealing tools. The cross ties or strap iron members **67** and **68** are assembled in place and extend through the strips **27**, as illustrated in Fig. 11, and through inclined holes **69** in the upright members **61** or **61'** as illustrated in Figs. 12 and 13. These cross-ties **67** and **68** are affixed to the double-headed securing means **70** in accordance with the disclosure of the aforementioned co-pending applications with the exception that on account of the separable portions **56** and **57** of the grain car door construction with the contiguous edges of these portions assembled as in Fig. 11, it is necessary to incline the strips **67** and **68**, as shown. However, in the structure as shown in Fig. 15 wherein the contiguous edges of the door portions **56'** and **57'** are arranged in overlapped relationship suitably affixed by nailing together, as illustrated, the retaining strips **67** and **68** may extend through the center of the upright **61'**. When assembled in this manner, it is not necessary to use the latch means **24'**, as illustrated in Figs. 12 and 13. The ends of the strips **67** and **68** are provided with at least three holes and these permit adjustment of the harness structure formed by the members **67** and **68** to different widths of railway cars. The harness members **67** and **68** are not erected so that they are taut but with a predetermined slack therein, so that as the car is loaded with the bulk material, the slack is taken up and the portions **56** and **57** are permitted to have a slight bulge with the center structure acting as an intermediate reinforcing column to prevent further additional movement of the grain door at the center than is permitted by the slack in the members **67** and **68**. The vertical support **61** or **61'** should have sufficient strength and a cross section of a suitable moment of inertia to prevent undue bowing of the upright with loadings of bulk material from eighty thousand to over one hundred and twenty thousand pounds, depending upon whether an effective height of six feet or eight feet is used for the grain door construction. The flap **56*a*** of each section **56** and **57** is suitably nailed to the floor, or a nailing strip **56*b*** formed with a plywood strip may be used to seal the bottom edge of the grain car door structure **55** to prevent any leakage and to retain the door in position.

With paper or reinforced grain car doors, it has been customary in the past to cut an opening at the bottom of the door by slitting the reinforced sheet material to permit removal of the grain or other bulk material. This has caused the previous doors to be of no further use and consequently they were considered as disposable, and it was impossible to salvage anything of value. With the present construction, the retaining strips or grain car doors may have some salvage value, if they have not become pierced in any manner beyond repair, and the latches **24** are reusable as well as the uprights. Since these represent a large item of expense, any salvage will be beneficial. In some instances, it is even possible to salvage the cross-ties **67** and **68**. Usually, however, in dismantling a disposable door of this nature, a sharp hatchet is used by the employee doing the unloading to cut the strap members **67** and **68** as well as the member **65**. In order to provide an opening at the bottom of the grain door, applicant has formed a simple portion construction, as best illustrated in Figs. 10 and 14. A port **71** may be fabricated by cutting along the diagonal lines **72** and **73** so that four triangular flaps **74** are formed. These triangular flaps may be rolled upon strips **75** to form a frame for each edge of the port. This rolling may be substantially the same as that described with reference to fabricating the contiguous inner edges of the retaining strip portions or door portions about the reinforcing strip **27** as described with reference to Figs. 1, 4 and 8. Should the wrapping take up too much space, if desired, the triangular portions **74** may be cut off along the lines **76** to form the trapezoidal portion **77** which may then be wrapped, as described above, about the reinforcing strip **75**.

A cover **78** may also be formed in a somewhat similar manner as the port **71**. A larger sheet of similar material to that of the sheet material forming the grain car door is cut to a preferred size, and the corners cut inwardly to provide trapezoidal-shaped strips **79** which in turn are wrapped over reinforcing strips **80** in the same manner as that described with the reinforcing strips **75** for the port **71**. The frame as thus formed for the port and cover

may have the wrapped portions securely stapled by staples **81** or other forms of securing means. In order to detachably secure the frame of the cover to the frame of the port, oppositely spaced holes **82** are provided on each edge of the port and on each edge of the frame as illustrated in Figs. 10 and 14. Latching means **24** similar to those as described with reference to Figs. 4 and 5 are assembled in position through the corresponding complemental edges of the frames for the port **71** and cover **78**. When it is desired to detach the cover, the latches **24** may be detached as described above to permit the bulk material to discharge through the port **71**, or it is possible to place the inlet opening of a pneumatic system through the opening **71** as the opening is of such a size as to accommodate the conventional inlet pipe of a pneumatic system. It is also within the scope of the invention that, if necessary, the cover may be pierced with the inlet opening of a pneumatic system, the cover **78** being then replaced if it is possible to salvage the remainder of the door **56**.

The construction of the port frame and cover therefor is such as to provide sufficient reinforcement at the opening and to effectively seal the opening. With the construction of the port and cover, as illustrated in Figs. 10 and 14, it is possible either to complete the construction on the job or to provide the portion **56** with the prefabricated opening and closure complete. However, as it is preferable to roll the portions of the grain car door to provide a compact assembly for shipment, it is preferred to assemble the fabricated opening as the door is erected in which case the lines where the opening is to be formed may be stencilled in place, and the parts for the frame members enclosed in the bundle as well as the sheet to form the closure **78**. Although the latch members **24** have been disclosed for securing the closure in place, it is possible to use short lengths of soft wire which may be inserted in place and affixed by twisting. The use of short iron wires may also be employed in place of the latching means **24** in the construction of Figs. 1, 4, 8 and 10, if desirable, or if the latch means are not available without departing from the scope of this invention.

In addition to the preferred form of latching means, as described with reference to the construction of Figs. 1 through 14, other modifications thereof are illustrated in Figs. 16 through 20. Since the separable portions **25** and **26** of the retaining strip structure **23** as disclosed with reference to Fig. 1 are the same, like reference characters will indicate the same or similar parts. The modified retaining strips are erected in the same manner, the only difference being in the construction of the latching means. In the embodiment **85** of Fig. 16, slotted holes **86** are formed in each of the reinforcing strips of the wrapped contiguous edges which receive a strap **87** having a conventional buckle construction **88**. The straps are inserted through the slots and buckled in a conventional manner forming a suitable latching means for restraining the separation of the strip portions at the joint.

The embodiment **90** of Fig. 17 illustrates the use of a ring **91** inserted through holes **32** in the reinforced edges of the retaining strips and, after they are inserted, the open ends of the rings **90** are closed together with a suitable tool. This construction is similar to a hog ring. The ring should be formed of wire of sufficient gage and carbon content to permit the rings to be opened and closed.

In the embodiment **93** of Fig. 18, the retaining strip portions **25***a* and **26***a* are modified from that of the construction of Figs. 1 and 2 in that the contiguous inner edges of the strip portions are overlapped over a vertically extending rod **94** shaped as illustrated in Fig. 18, and the folded over edge of the strip portions is affixed by staples **95** or other suitable securing means. The extended ends of the rods **94** are affixed together by rings **96**, which are preferably welded rather than being open as the rings **91** of the embodiment of Fig. 17. The hooked ends of the rods **94** prevent the rings from becoming disengaged when the retaining strip **93** is affixed in place across the car doorway.

In the embodiment **98** of Fig. 19, the retaining strip portions **25** and **26** are illustrated as being affixed together by a chain construction **99**. One end of the chain **99** is affixed to a ring **100**, which is affixed by a staple **101** to the reinforced edge of the retaining strip portion of a construction similar to the described in Figs. 1 and 4. The chain **100** is threaded through opposite aligned holes **32** and then back through the ring **100** with suitable tension and then the overlapped portions of the chain are affixed together by a cotter key **102** or the like securing means.

In the embodiment **103** of Fig. 20, the sheets **25″** and **26″** are overlapped at the joint between the contiguous inner ends as described with reference to Fig. 9. However, instead of the latching means **54**, there has been provided a hairpin construction **104** which extends across the overlapped reinforced edges to affix the strip portions together in the same manner as the latching means **51**; but, however, there is no need to provide drilled holes through the strips, thus making a simple construction in the erection of the strips in a car doorway.

From the above disclosure it is evident that there has been disclosed a simple form of retaining strip for a car doorway not required the conventional reinforcing steel strapping as of the prior art, but yet has substantially the same strength across a car doorway in retaining packaged carload shipments because of the improved form of reinforced kraft paper construction, having an intermediate layer of high strength glass fiber scrim sheets. The scrim sheets can be made in any conventional weave in which the horizontally and longitudinally extending strands of glass fiber may be spaced in any conventional spacing, and in which the strands may be formed of any number of fiber ends in the manner well known in the art. Although one hundred and seventy pound sheet was disclosed as being preferred, it is also within the scope of the invention that sheets of one hundred and twenty pound weight, two by two fiber or one hundred and sixty pound weight, two by two glass fiber strands may be used with the spacing preferably of the fiber strands being substantially one-half inch in either direction. It is also possible to use combinations of sheets other than described with reference to Figs. 6 and 7, wherein one sheet may be formed from kraft paper to which is laminated a scrim sheet and the opposite surface being a cellophane sheet. Also, any combinations from one or more sheets may be arranged to produce the required strength, depending upon the load, and this use of multiple sheets is equally permissible not only with the retaining strip construction as described with reference to Fig. 1, but is equally adaptable for the separable strip portions **56** and **57** of a grain car door construction **55** when it is desired to use multiple sheets rather than a single sheet for bulk carloadings in which the weight is over eighty thousand pounds, and the widths of the grain car door and the heights thereof are greater than six feet.

There has also been disclosed a preferred form of latching means in the form of a detachable latch, which may either be erected on the job or in the factory as the retaining strips are fabricated. The latching means is preferably arranged as illustrated in Figs. 1, 8 and 10 so that in opening the car door **13**, the movement of the car door does not tend to unlatch the latches.

There has also been disclosed a simple form of open and overlapped joint constructions for the retaining strip constructions and also for the overlapped constructions of the sealed joint between the portions of the grain car door.

Also, a simple form of port and closure has been provided in a grain car door construction to facilitate the

unloading of bulk material without causing excessive damage to the car door construction so that while the constructions are primarily for a disposable form of grain car door or bulk car door construction, it is possible to salvage the constructions for reuse unless the elements of the construction are greatly damaged.

In addition to the preferred form of latching means, other simple forms of securing retaining strips of the construction disclosed may be used without departing from the scope of the invention.

The retaining strip constructions and the grain car or bulk car loading doors are economical, simple to fabricate and to erect with conventional tools used in coopering a car, and are competitive with conventional type of retaining strips or grain car door constructions.

Having thus described my invention, it is obvious that various immaterial modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact form, construction, arrangement and combination of parts herein shown and described, or uses mentioned.

What I claim as new and desire to secure by Letters Patent is:

1. In a retaining strip structure for railway cars and the like having doorways of relatively uniform transverse dimensions but in which the space between door post structures may vary in different cars, the combination of a retaining strip of relatively flexible sheet material, said retaining strip adapted to extend across a respective doorway and to be operatively secured at its opposite side edges to said door post structure, said retaining strip being separable intermediate the door post structure, a pair of relatively rigid strips about which the separable side edge portions of the retaining strip are wrapped, vertically spaced and oppositely arranged openings in the wrapped rigid strips, means for securing said separable wrapped edges to said rigid strips, securing means for detachably affixing the wrapped separable edges of the retaining strip together, said securing means comprising a detachable latch with the ends thereof adapted to extend through the oppositely arranged openings in the aforesaid wrapped rigid strips, and complementally formed means on the ends of said detachable latch for detachably affixing the ends of the detachable latch together.

2. The combination with a doorway for railway cars and the like having relatively uniform transverse dimensions but in which the space between door post structures may vary in different cars, of a retaining strip comprising sectional portions, each of said sectional portions formed from relatively flexible sheet material, said retaining strip adapted to extend across a respective doorway and operatively secured at its opposite side edges to said door post structure, said sectional portions being separable intermediate the door post structure, and each of said sectional portions having the opposite edges thereof substantially rigid, said edges adapted for being affixed to the door post structures with the inner contiguous edges of the sectional portions adapted to be affixed together to complete the retaining strip, said inner contiguous edges of the sectional portions provided with vertically spaced and oppositely arranged openings, and securing means for detachably affixing the inner contiguous edges of the sectional portions of the retaining strip together comprising a detachable latch with the ends thereof adapted to extend through the oppositely arranged openings in the aforesaid sectional portions, and complementally formed means on the ends of said detachable latch for detachably affixing the ends of the detachable latch together.

3. In a retaining strip structure for railway cars and the like according to claim 1, wherein said detachable latch comprises a portion intermediate the ends thereof substantially V-shaped with the apex intermediate the ends of the detachable latch, whereby the contiguous edges of the retaining strip being separable intermediate the door post structure into sectional portions are canted to substantially the angle between the legs of the V-shaped portion and the angle of the outer ends of the securing means, whereby the joint between the contiguous edges of the sectional portions of the retaining strip are reinforced.

4. In a retaining strip structure for railway cars and the like according to claim 1, wherein another pair of relatively rigid strips for the opposite side edges of the retaining strip adapted to be operatively secured to said door post structure and about which the aforesaid opposite side edges are wrapped providing means for adjusting the retaining strip to the space between the door post structures as the space varies in different cars.

5. In a retaining strip structure for railway cars and the like according to claim 1, comprising an additional retaining strip of relatively flexible sheet material adapted to extend across a respective opposite doorway and to be operatively secured at its side edges to said doorpost structure for said opposite doorway.

6. In a retaining strip structure for railway cars and the like according to claim 1, wherein said retaining strip comprises a plurality of tiers of retaining strips separable intermediate the doorpost structure, each retaining strip of its respective tier adapted to extend across a respective doorway and to be operatively secured at its opposite side edges to said doorpost structure, and the separable wrapped edges of each retaining strip adapted to be detachably affixed by the aforesaid securing means for detachably affixing the wrapped separable edges of the retaining strip together.

7. In a retaining strip structure for railway cars and the like according to claim 1, wherein said securing means comprises a plurality of said detachable latches, and each of said detachable latches extending through the vertically spaced and oppositely arranged openings in the wrapped rigid strips with the ends of the respective detachable latches affixed together for detachably affixing the wrapped separable edges of the retaining strips together to complete the retaining strip as it extends between the doorpost structure of the doorway.

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