

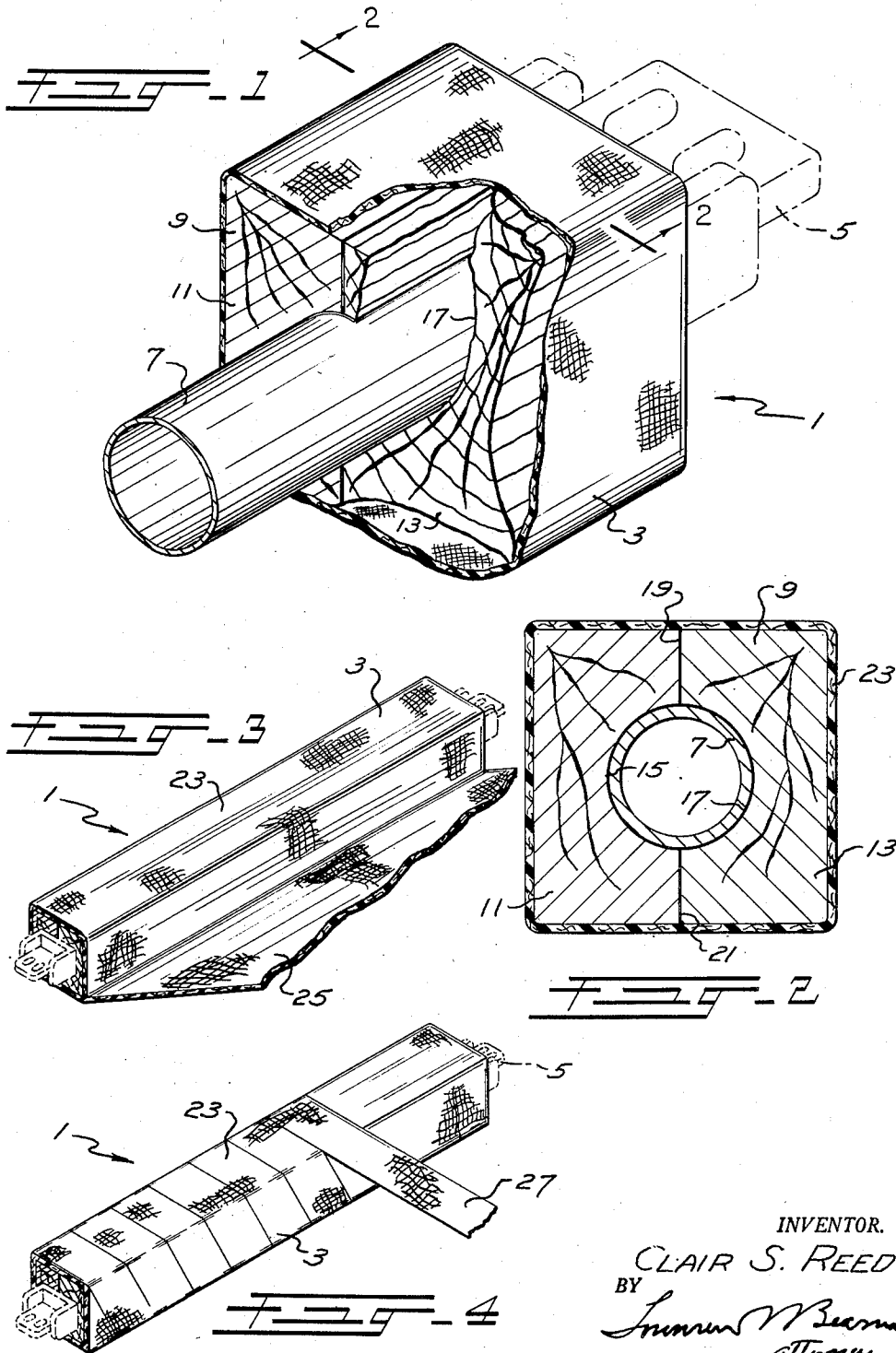
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DUNNAGE BAR

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DUNNAGE BAR

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The present invention relates to load braces for use in freight vehicles, and more particularly to dunnage bars for use in railway box cars or van type highway trucks to brace cargo or support platforms or decks or divide a carload into separate compartments or sections.

An object of my invention is to provide a dunnage bar which will be light in weight but which will at the same time be strong in flexure, tension and compression.

Another object of my invention is to provide a dunnage bar having nailing surfaces which will not scuff, crack or fray.

Still another object of my invention is the provision of a dunnage bar having a nailing surface extending all around the bar and comprising substantially the entire outer surface of the bar.

Finally, my invention contemplates a dunnage bar which will be easy and inexpensive to manufacture and which will be rugged and durable in use.

Other objects and advantages of the invention will become apparent from the following description, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a perspective view of a broken away portion of a dunnage bar according to my invention, looking in the direction of the end of the bar.

Figure 2 is an elevational cross-sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a perspective view of a dunnage bar according to my invention, showing a layer of glass fiber being rolled around the same; and

Figure 4 is a view similar to Figure 3, but illustrating the optional step of applying a still further layer of glass fiber by spiral winding.

Referring now to the drawings in greater detail, I have shown a dunnage bar generally indicated at 1, comprising an elongated member 3 of rectangular cross-section, provided at both ends with conventional end fittings 5. Fittings 5 are conventional in structure and are adapted to coact with complementary fittings (not shown) provided on the side walls of freight vehicles, in a manner known to the art.

Member 3 comprises a hollow, cylindrical steel tube 7 which serves as a central core of the bar comprising the invention. Tube 7 extends full length of the bar; and end fittings 5 are welded or otherwise secured to opposite ends of tube 7. Tube 7 of course may also be formed of cast iron and may comprise a length of cast iron pipe; however, it is preferred to form tube 7 of steel so as to obtain the greatest possible strength for a given weight of tube.

Entirely surrounding tube 7 is a wooden casing 9, of which the contour of the outer surface is rectangular, and, in the embodiment shown, square. The casing is comprised of a pair of wooden beams 11 and 13 in side-by-side relationship. The beams are provided in their contiguous faces with semi-cylindrical grooves 15 and 17 which are opposed in curvature and in registry with each other to define a cylindrical recess within which tube 7

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is received. Grooves 15 and 17 define on either side spaced side surfaces 19 and 21 of beams 11 and 13. In assembled relationship, with tube 7 disposed in grooves 15 and 17, surfaces 19 and 21 abut, and the side walls of grooves 15 and 17 contact the entire outer surface of tube 7. The assembly of beams 11 and 13 and tube 7 is cemented or otherwise secured together.

Entirely surrounding member 3 is a sheath of glass fibers 23. The glass fibers are bonded together by impregnation with a cured thermosetting resin. Such resins may comprise, for example, epoxide resins, polyester resins, phenol-aldehyde resins, or the like; but particularly preferred is epoxide resin in view of its superior wetting qualities relative to glass fiber.

In Figure 3, the application of the glass fiber to member 3 is illustrated. The fiber as there shown is in the form of unidirectional glass cloth, that is, a cloth of glass fibers in which almost all of the fibers run in a single direction, an occasional fiber in the opposite direction being provided to hold the cloth together. Thus, as seen in Figure 3, the direction in which most of the glass fibers run is longitudinal of member 3. In this way, a great deal of flexural strength is imparted to the bar. The fiber is applied simply by rolling up sheet 25 on member 3 until the desired thickness of glass fiber is obtained.

In Figure 4, a refinement is shown comprising the provision of spiral wound glass fiber on top of the glass fiber applied as shown in Figure 3. In the refinement of Figure 4, a unidirectional strip or tape 27 of glass fiber is shown, in which most or all of the fibers are disposed parallel to each other and longitudinal of strip 27. Strip 27 is wound spirally or convolutely on the layer of glass fiber previously laid down by means of sheet 25, in order to provide a measure of hoop strength for member 3.

Sheets and strips 25 and 27 must be of course applied when the thermosetting resin is uncured. After the sheets and strips are applied, the bars are placed in a curing oven or between the plates of an induction heating device, and maintained at elevated temperature until the thermosetting resin sets up and a cure is effected.

Dunnage bars according to my invention as described above combine high strength with relatively light weight, inasmuch as the materials from which they are formed are arranged in such a way as to provide maximum utilization of their strength characteristics. Moreover, it will be noted that dunnage bars according to my invention provide a nailing surface entirely around the periphery of the bar, into which nails may be driven at any point and from any direction in order to secure the cargo to the bars. Furthermore, it should also be noted that the thin layer of glass fiber, desirably of a thickness of around 0.040 inch, bonds to the wood beneath it upon curing of the impregnating resin, and that nails may be driven through this thin layer of glass fiber against the relatively yielding backing of the supporting wooden member, without fracturing the glass fiber sheath and without cracking or splitting the wooden casing. Finally, the glass fiber sheath maintains a smooth surface under severe conditions of use and does not crack or fray or scuff in the manner of dunnage bars known heretofore.

It will be obvious that I have achieved all of the initially recited objects of my invention.

Although the present invention has been described in conjunction with preferred embodiments, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention, as those skilled in the art will readily understand. Such modifications and variations are considered to be within the purview and scope of the invention and appended claims.

I claim:

1. A dunnage bar for use in a freight vehicle, comprising a structural metal tube extending full length of said bar, a wooden casing surrounding said tube and in contact with substantially the entire outer surface of said tube, and a sheath of glass fibers surrounding said casing and secured to the entire outer surface of said casing, said glass fibers being impregnated with a cured thermosetting resin, at least some of said glass fibers extending longitudinally full length of said casing.

2. The invention of claim 1, at least some of the outer-

most of said glass fibers being disposed spirally about said bar.

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