

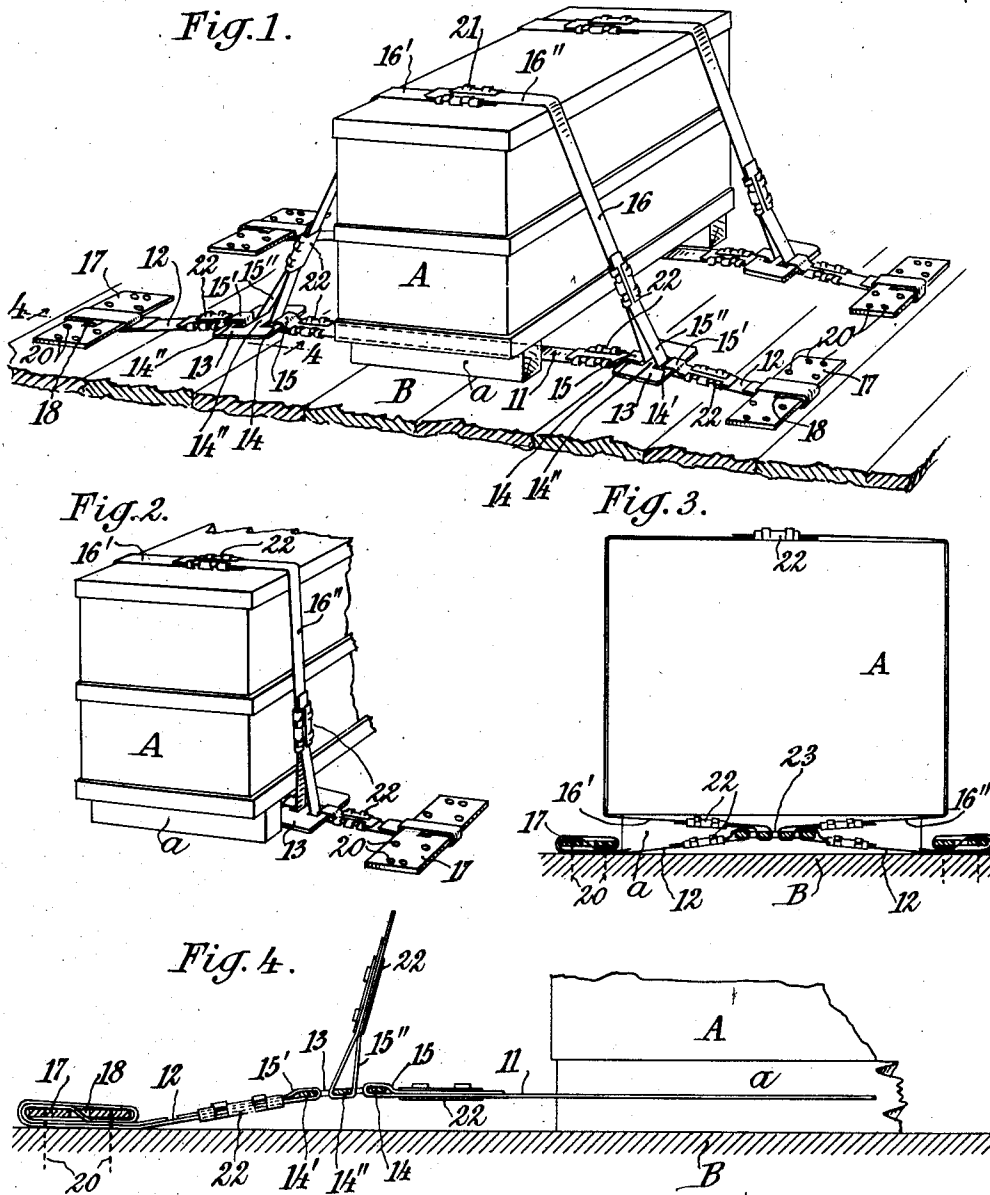
March 3, 1936.

G. H. PRIDE

2,032,591

METHOD AND APPARATUS FOR DUNNAGING MATERIALS

Filed Jan. 15, 1935



INVENTOR

George H. Pride,
BY *Traver, Myers & Manly*
ATTORNEYS.

UNITED STATES PATENT OFFICE

2,032,591

METHOD AND APPARATUS FOR
DUNNAGING MATERIALS

George H. Pride, New York, N. Y.

Application January 15, 1935, Serial No. 1,877

10 Claims. (Cl. 280—179)

This invention relates to improvements in the art of handling materials in transit, and is particularly directed to the dunnaging of heavy case goods or other heavy articles which are substantially non-deformable.

The transportation of such materials presents a problem, arising from the tendency of the material to shift its position in the transporting vehicle while in transit; the sudden starting and stopping of the vehicle, for example, giving rise to pronounced tendencies toward vertical and horizontal displacement of the material. A variety of dunnaging means are available for use in opposing the tendency toward horizontal motion of the material in the vehicle, but such means alone are entirely inadequate and offer no solution to the problem. It is of prime importance that dunnaging be provided to directly oppose the tendency toward vertical motion of the material, for such vertical motion, if unimpeded, rapidly loosens and completely destroys whatever dunnaging has been provided.

Although the problem has been approached by attempting in various ways to fasten the material down to the floor of the vehicle, all such efforts have failed of complete fulfillment of their purpose. The results of such attempts invariably have been that the nails, screws, or other means used to secure the material to the vehicle floor became loosened and thereby rendered the article insecure and in a state wherein it might be damaged and might cause damage to other nearby articles.

These failures may be attributed to the fact that the stress exerted on the nails, screws, or other means of connection to the floor has been a substantially vertical pull stress; and as the nails or screws are in a substantially vertical position in the vehicle floor, such vertical pull stress exerted on the nails or screws rapidly loosens them and renders the dunnaging ineffective. Efforts have been made in some instances to secure articles to the vehicle floor by the use of bolts, but even these efforts have been unsuccessful, as in many such instances the planking of the floor has been pulled away from the substructure of the vehicle.

An important object of the present invention is to overcome the foregoing difficulties by providing a method and apparatus for dunnaging material whereby the tendency toward vertical motion of the material is effectively restrained, with the result that losses from damage to material in transit are greatly minimized.

In achieving the objects of this invention recog-

nition is given to the fact that the failure or previous attempts along this line may be attributed to the fact that the dunnaging means used have been subjected to a direct tendency to be withdrawn from the floor of the car at the point where attached; and in providing the present new and improved means for achieving the aforesaid objects, the dunnaging material is so arranged that the nails or screws used as means of attachment to the vehicle floor are subjected, not to a purely vertical pull, but to a pull having a component which is substantially horizontal to the car floor, whereby the dunnaging apparatus which is secured by such screws or nails may ordinarily be freed only where the pull is of sufficient magnitude to effect a shearing of the screws or nails. Obviously nails or screws of sufficient size and in sufficient number may be provided to withstand any such shearing action.

It is recognized that the pull or stress may have a vertical component, but in the practice of my invention the said horizontal component is sufficient to minimize the tendency of the screws or nails to be pulled out by any vertical component. As a result of this arrangement of my dunnaging apparatus, it is more securely anchored to the vehicle than where, as with previously known facilities, a purely direct pull is exerted upon the nails used, all other conditions being equal. It is to be understood that any reference in this specification or in the appended claims to a stress which is horizontal or parallel to the vehicle surface or substantially so is not to be construed as implying the non-existence of any possible vertical stress.

I achieve the foregoing objects by providing one or more bands which may be passed over the material, but which, instead of being directly secured to the vehicle floor, are connected to flexible floor bands which are disposed at the base of the material, substantially parallel to the floor, with a free space above them to permit them to flex when subjected to the stresses encountered in holding the material to the vehicle floor. The ends of the floor bands are screwed, nailed, or otherwise secured to the floor. The bands which are passed over the material are secured to the floor bands at a point or points intermediate the ends thereof, and thus the tendency toward vertical displacement of the material will merely cause an increased horizontal tension on the floor bands, and as a result there will be little or no pull exerted which might tend to withdraw the screws or nails from the vehicle floor.

My present invention is defined in the appended claims and is hereinafter described in detail.

In this description reference is made to the accompanying drawing in which

Figure 1 is a perspective view of a preferred embodiment of my invention as applied to a packing case;

Fig. 2 is a fragmentary view in perspective of a modified application of my invention;

Fig. 3 is a cross-section of a packing case as secured to a vehicle floor in a further modified application of my invention; and

Fig. 4 is a fragmentary cross-section on the line 4-4 of Fig. 1.

Referring to Figs. 1 and 4, a packing case A is supported on skids *a* on the vehicle floor B. Flexible floor bands 11 are provided which pass under the packing case between the skids with a free space above them to permit them to flex. At a distance from the base of the packing case the floor bands 11 have flexible accessory floor bands 12 connected thereto by links 13 having shanks, 14, 14', and 14'', around which are passed loops 15, 15', and 15'', respectively, formed on the ends of the floor band 11, the accessory floor band 12 and an encircling or tying band 16. The aforesaid loops are secured against parting by metal binding elements 22 which embrace the ends of the loops, as best shown in Fig. 1. The outer ends of the accessory bands 12 are secured to floor plates 17 by being passed through slots 18 therein and then passed completely around the floor plates, by the rotation of the latter, before being secured to the floor, as best shown in Fig. 4. The floor plates are secured to the floor by nails or screws 20 of a suitable size. Thus the floor band 11 and the connected accessory floor bands 12, the outer ends of which are fastened to the floor, form an articulated and flexible floor member having provision thereon at a distance from its floor anchorage where material encircling or tying bands may be secured. In fastening this floor member to the floor, one of the floor plates 17 is nailed or screwed into position, the floor member is then tensioned, and, while under tension, the other floor plate on the opposite end of said member is nailed or screwed to the floor. Under certain conditions the floor member may be fastened to the floor and then tensioned by the tensioning of the encircling or tying bands 16 about the article.

The encircling bands 16 are adapted to be passed over the article to hold it down to the vehicle floor. They are in two parts, 16' and 16'', the lower ends of which are fastened to the shanks 14'' of the links 13 by means of loops 15''. The other ends of the bands 16' and 16'' overlap and are connected under tension by metal binding elements 21 which are similar to those used in forming the loops connecting the several bands to the links 13. The bands 16' and 16'' pass over the article, and when connected together and to the floor member under tension, operate to hold the material securely in place on the vehicle floor.

It will be seen from the foregoing that the encircling bands 16, which directly operate to hold the packing case to the floor, are not directly connected to the floor, but are connected to the floor member, which flexes slightly under the tension of the encircling bands, as best shown in Fig. 4. The floor member is under a tension exerted in a line substantially parallel to the vehicle floor, and as the encircling bands are attached to said floor member at points intermediate the ends thereof, the effect of any vibration of the vehicle tending to set up vertical motion

or vertical vibrations in the packing case, only tends to momentarily increase the substantially horizontal tension on the floor member. This increased tension does not exert any appreciable vertical pull on the nails or screws 20 used to fasten down the floor plates 17 and, therefore, the floor member remains effectively secured to the floor, even under the most extreme conditions which might be experienced in transit. The momentary increases in the tension on the floor bands impose an increased horizontal or shearing stress on the nails or screws used to secure the floor plate to the floor, but the nails or screws are of such size and material that they will withstand any such horizontal or shearing stresses which might be encountered.

The application of my invention illustrated in Fig. 2 differs from that of Fig. 1 in that the encircling bands 16' and 16'' lie parallel to the sides of the packing case and are connected to the floor member at points adjacent the juncture of the side and bottom of the packing case; while in the application of the invention shown in Fig. 1, the said encircling bands are angularly disposed with reference to the side of the packing case, being connected to the floor band at a distance from the packing case.

The application of my invention illustrated in Fig. 3 differs from that illustrated in Figs. 1 and 2, in that the encircling bands 16' and 16'' pass at least partly underneath the packing case between the skids *a* and are connected to the floor member at a point underneath the packing case. In this modification a single link 23 may be utilized, to which both accessory floor bands 12 and the parts 16' and 16'' of the encircling bands may all be connected, as shown. As thus arranged, the link 23 assumes the functions of the floor band 11 of the modification illustrated in Fig. 1.

It will be apparent that the manner of using this invention depends largely upon the space available within the vehicle around the packing case. Aside from this consideration, the applications of my invention, as illustrated in Figs. 2 and 3, might advantageously be used where it is desired to secure additional restraint against horizontal shifting of the case. In both such applications of the invention the encircling or tying bands 16' and 16'' operate directly upon the sides and base, as well as on the top of the article, thus affording additional restraint against displacement of the case.

In practicing this invention the dunnaging apparatus may be provided as units specially manufactured in a variety of sizes adapted to meet the ordinary requirements in this field. The apparatus will preferably be made of steel having properties suitable to the intended functions of the apparatus. The various bands may be made of commercial steel strip or "hoop iron", such as is commonly used for baling purposes, or they may be of steel wire of cylindrical cross-section—in either case being of suitable thickness and having a tensile strength sufficient to withstand the most extreme tension which might be encountered in practice.

It will be apparent from the foregoing that my invention disclosed herein might be variously utilized without departing from the spirit of the invention as set forth in the following claims.

What I claim is:

1. The method of dunnaging an article in a transporting vehicle, which comprises connecting a flexible anchorage member at a plurality of points to a portion of the vehicle and in a posi-

tion substantially parallel to said portion of the vehicle, passing a tie member about the article and securing said tie member to the anchorage member at points intermediate the points of connection thereof to the vehicle and tensioning said tie member to an extent sufficient to impose a tension on the anchorage member and to hold the article in contact with the vehicle.

2. The method of dunnaging an article in a vehicle, which comprises connecting the effective ends of a flexible anchorage member to a portion of the vehicle adjacent the article, tensioning said member, passing a tie member about the article and securing said tie member under tension to the anchorage member intermediate the points of connection thereof to the vehicle whereby the stress present at said points of connection in holding the article in intimate contact with the vehicle is in a direction substantially parallel to the portion of the vehicle to which the anchorage member is connected.

3. The method of dunnaging an article resting in the floor of a vehicle, which comprises encircling the article with a band and connecting the said band under tension to a tensioned flexible floor member the effective ends of which are secured to the vehicle floor, the said band being connected to the floor member intermediate the points of connection thereof to the vehicle floor whereby the directions of the stresses at said floor connections are such that the tendency of such connections to loosen or pull apart is reduced to a minimum.

4. The method according to claim 3, which includes mounting the article on skids and connecting the band to the floor member at a point between the bottom of the article and the vehicle floor.

5. Apparatus for dunnaging an article in a vehicle, comprising a flexible anchorage member fixedly connected at a plurality of points to a portion of the vehicle, and a restraining member connected to said anchorage member intermediate the points of connection thereof to the vehicle adapted to engage the article to prevent excessive movement thereof, the restraining member and the anchorage member being disposed in substantially the same plane.

6. Apparatus for dunnaging material in a vehicle, comprising a flexible anchorage member connected at its effective ends to a portion of the vehicle, and material restraining means connected to the anchorage member intermediate the points of connection thereof to the vehicle, the anchorage member being disposed substantially along the shortest line between the said

points of connection and being so disposed relatively to the material that flexing of the anchorage member will be substantially unobstructed by any part of the material.

7. Apparatus for dunnaging material in a vehicle, comprising an articulated anchorage member connected at its effective ends to a portion of the vehicle, and material restraining means connected to the anchorage member intermediate the points of connection thereof to the vehicle, the anchorage member being disposed substantially along the shortest line between the said points of connection and being so disposed relatively to the material that flexing of the anchorage member will be substantially unobstructed by any part of the material.

8. Apparatus for dunnaging material in a vehicle, comprising a flexible anchorage member connected at a plurality of points to a portion of a vehicle, and material restraining means connected to the anchorage member intermediate the points of connection thereof to the vehicle, the anchorage member being disposed substantially along the shortest lines between said points of connection and being adapted to flex in a direction substantially perpendicular to said vehicle portion, said anchorage member also being so disposed relatively to the material that such flexing will be substantially unobstructed by any part of the material.

9. Apparatus for dunnaging material in a vehicle, comprising an articulated anchorage member connected at its effective ends to a portion of a vehicle, and material restraining means connected to the anchorage member intermediate the points of connection thereof to the vehicle, the anchorage member being disposed substantially along the shortest line between said points of connection and being adapted to flex in a direction substantially perpendicular to said vehicle portion, said anchorage member also being so disposed relatively to the material that such flexing will be substantially unobstructed by any part of the material.

10. The method of dunnaging material in a transporting vehicle, which comprises connecting a flexible anchorage member at its effective ends to a portion of the vehicle with said member disposed substantially along the shortest line between the points of connection thereof to the vehicle, connecting a material restraining member intermediate the said ends of the anchorage member and bringing said restraining member into restraining relationship with the material.

GEORGE H. PRIDE.

CERTIFICATE OF CORRECTION.

Patent No. 2,032,591.

March 3, 1936.

GEORGE H. PRIDE.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 23, claim 3, for the word "in" read on; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 14th day of April, A. D. 1936.

(Seal)

Leslie Frazer
Acting Commissioner of Patents.