May 23, 1939. V. J. GIBBONS 2,159,848

METHOD AND MEANS FOR SECURING HEAVY BODIES DURING SHIPMENT

Filed April 21, 1937

Fig. 1.

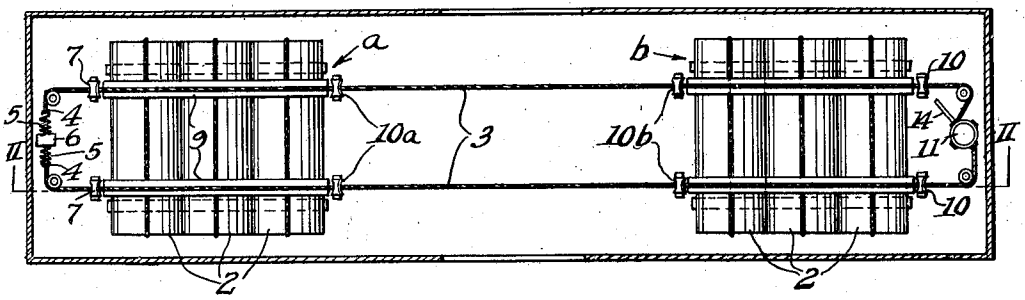



Fig. 2.

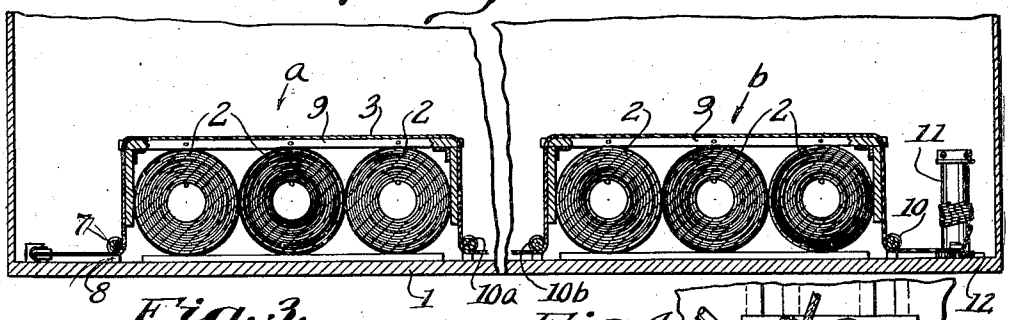



Fig. 3.

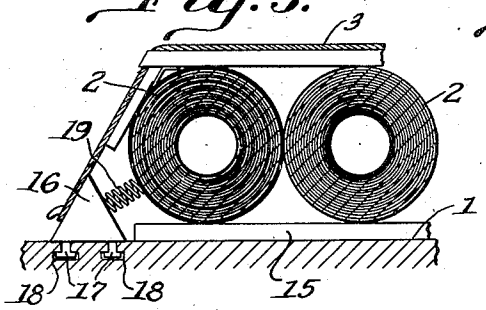



Fig. 4.

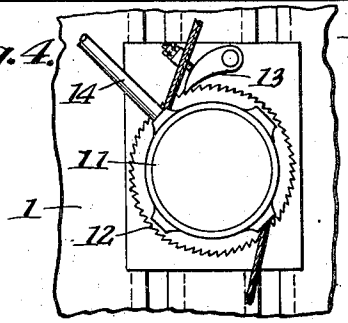



Fig. 5.

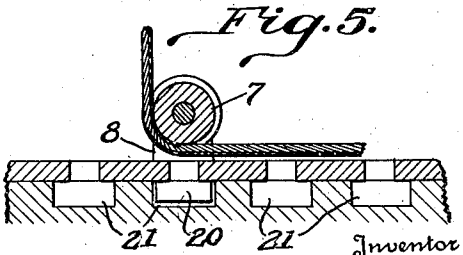
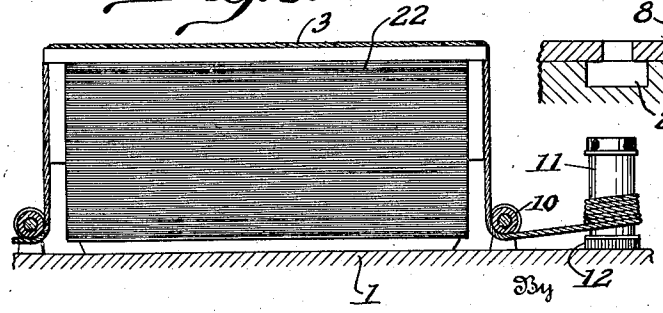



Fig. 6.




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## METHOD AND MEANS FOR SECURING HEAVY BODIES DURING SHIPMENT

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Application April 21, 1937, Serial No. 138,227

10 Claims. (Cl. 280—179)

This invention relates to an improved method and means for securing heavy bodies against movement during shipment thereof, and has particular reference to the prevention of motion of iron and steel sheets and coils of steel, iron and paper or other equivalent cylindrical objects, during transit on or in trucks, trailers or railway cars.

In the shipping of coils of iron, steel, paper cylinders and also sheet steel, considerable damage results from uncontrolled movement of such bodies due to improper fastening of the same in connection with the floor or platform of the transporting vehicle. When a vehicle loaded with such heavy bodies starts or stops suddenly, the inertia of a coil or pile of sheets composing such a body is tremendous and prior attempts to keep the body stationary while in transit have not heretofore been successful.

The principal reason for the continued failure to keep said heavy bodies from moving in transit is considered to be largely attributable to the present manner in which it is attempted to block, brace or shore the bodies on the floor of a car. Mainly, this blocking or shoring is applied to the lower portions of said bodies. Since most of the inertia forces of a coil or pile of sheets are manifested in the top thereof, any attempt, therefore, to block, brace or shore said bodies underneath or against the bottom of the same is largely ineffective in obtaining the firm securing of said bodies to a car deck or platform. Such bottom bracing or blocking is now a common practice, so far as I am aware, in the shipment of bodies of the type above described.

It is therefore an object of the present invention to provide an improved method and means for securing such bodies against undue movement during shipment by the employment of an improved fastening means so designed as to resist the mass inertia of said bodies where the inertia forces are the greatest, namely, around the upper regions thereof.

Another object of the invention is to lash the bodies down by passing a cable or cables over the sides and top thereof and for drawing and maintaining said cables in a taut condition when operatively applied to said bodies.

A further object resides in a fastening of the character aforesaid wherein provision is made for permitting limited yielding movement of the lashed bodies in response to inertia forces set up by the starting and stopping of the vehicle on which the bodies are carried, but wherein such yielding movement is limited and provides means for absorbing shock but without any loosening or uncontrolled movement of the bodies held down by the lashing cables.

For a further understanding of the invention, reference is to be had to the following description and the accompanying drawing, wherein:

Fig. 1 is a horizontal sectional view taken through a cargo carrying vehicle equipped with the improved lashing mechanism comprising the present invention;

Fig. 2 is a vertical sectional view on the plane disclosed by the line II—II of Fig. 1;

Fig. 3 is an enlarged detail vertical sectional view of a slightly modified form of the invention;

Fig. 4 is a plan view of the tightening windlass or spool for the lashing cables;

Fig. 5 is a detail sectional view showing the construction and mounting of one of the cable guides;

Fig. 6 is a detail side elevation disclosing the lashing mechanism as applied to the stack or pile of metal sheets undergoing transit.

Referring more particularly to the drawing, the numeral 1 designates the deck, floor or platform of a cargo transporting vehicle, such as a railway car, the bed or floor of a motor truck or trailer, or other transporting vehicle. The present invention is particularly concerned with the provision of an improved system for holding against undue movement during transit on such vehicles, heavy bodies of which coils of sheet iron or steel are outstanding examples, such coils having been indicated by the numeral 2 in the accompanying drawing. The tendency of such cylindrical bodies to roll or shift from selected positions during shipment is quite obvious and, as stated, large damage claims are attributable to this cause.

Therefore, to prevent such movement, I provide a lashing mechanism which, as shown in Figs. 1 and 2 particularly, comprises one or more wire rope cables, as indicated at 3. These cables have certain of their ends secured as at 4 to heavy coil springs 5 which, in turn, are suitably anchored as at 6 to the floor 1 of the transporting vehicle. From the springs 5, the cables 3 extend horizontally a limited distance and are passed around guides or pulleys 7, also secured as at 8 in connection with the floor 1. The rolls of sheet steel of the type indicated at 2, have placed thereover an inverted U-shaped frame 9, and the cables 3, after being passed around the guides or pulleys 7 are directed upwardly in parallelism and in contact with one of the vertical depending sides of a frame 9 and then drawn horizontally across the top of

said frame and downwardly in parallelism with the opposite vertical wall of the frame or frames.

After passing around the frame 9, as disclosed in Fig. 2, the lower end of each cable engages with a guide or pulley 10, suitably carried by the floor 1, and the end of the cable is secured to and fastened around a vertically disposed winding drum 11, mounted on the car floor. This drum is provided with ratchet teeth as at 12 which are adapted for engagement with a pawl 13 in order to retain the drum in a fixed position when the cable or cables 3 is wrapped thereabout in a taut manner. Rotation of the drum may be manually effected through the provision of the radially extending handle 14.

In Figs. 1 and 2, the coils of steel plate have been disclosed in spaced groups, as indicated at *a* and *b*. While the invention is applicable to a single group of rolls or cylinders, it may, of course, be applied to two or more groups of such objects as disclosed, in which case the cable or cables 3 is trained around supplemental guide pulleys 10*a* and 10*b* so that the cables will pass over the U-shaped securing frames 9 applied to each group of rolls.

In view of the foregoing, it will be seen that when the cables are tightened and passed around the rolls in the manner indicated, the said rolls or bodies will be positively confined against undue longitudinal movement on the deck or floor 1 of the transporting vehicle. The inertia forces present in the upper portions of said rolls or bodies are completely absorbed by the lashing so that the rolls cannot break loose from their secured positions. Undue stress or strain on the lashing cables is minimized by the provision of the shock absorbing spring 5 which provides for limited yielding for the lashing cables during sudden starts and stops of the transporting vehicle, but without releasing the assembled rolls.

A modified form of the invention is disclosed in Fig. 3 wherein the rolls 2 are placed on bottom timbers 15 and a cable 3 is secured to a triangular anchor block 16, which block is provided with depending headed studs 17 positioned in T-slots 18 provided in connection with the car floor. Initial thrust of the rolls is absorbed by means of a spring or springs 19 confined between the inner face of the block 16 and an adjoining end roll. As shown in Fig. 5, the pulleys or guides of the type indicated at 7, 10, 10*a* and 10*b* may be formed with brackets having depending headed studs 20, which are receivable within and removable from T-slots 21 formed in connection with the car floor. Also, the winding drum 11 may be similarly mounted. By this construction, the apparatus may be readily removed, when not in use, from the car floor in order to avoid interference with the shipment of other types of objects.

In Fig. 6, the apparatus is shown as applied to flat sheets 22 of metal, wherein the same results may be accomplished as in the handling of heavy bodies of cylindrical form.

As shown in the drawing, the taut cables press on the wood blocks or frames as indicated at 9, preventing the taut cables from rubbing or otherwise injuring the objects which they are designed to fasten. It will be noted that these blocks or frames have their depending vertical end portions terminated in planes above the floor and the guides or pulleys, in order that such blocking frames will not interfere with the action of the relief springs disclosed at 5 and 19. Therefore, the play or movement made possible by the wood blocks or frames supplemented by the elastic tension supplied by said springs succeed in giving the bound objects a certain but limited resilience, which will readily absorb shock caused by sudden starting or stopping of the carrying vehicle. The T-shaped slots 18 and 21 are preferably formed in manganese or nickel steel floor plates, which give high tensile strength to avoid accidental breakage of such plates under conditions of high strain or stress. The ends of the horizontal members of the protecting frames 9 may be grooved in order to act as guides for the passage of cables therethrough.

What is claimed is:

1. Apparatus for securing heavy cylindrical rolls of sheet metal or paper to the floor of a transporting vehicle during shipment comprising a flexible tie member having one end thereof secured to a relatively stationary part of a transporting vehicle, means for training said tie member around the sides and top of cylindrical rolls of metal or paper resting on the vehicle floor whereby to preclude uncontrolled longitudinal and vertical movement of said rolls relative to the floor, a winding appliance carried in connection with a stationary part of said vehicle and to which the other end of said tie member is connected, said winding member serving to place the tie member under tension and maintain the same in taut binding relationship with said rolls when in active operation, resilient means cooperative with said rolls to permit of limited longitudinal movement thereof relative to the vehicle floor while said tie member is maintained in a taut roll-binding state, and an inverted U-shaped bearing frame disposed between the intermediate portions of said tie member and the tops and sides of a group of said rolls.

2. Fastening apparatus for securing heavy bodies of cargo to the floor of a transporting vehicle during shipment comprising a cable, means for securing one end of said cable to a stationary part of the associated transporting vehicle, said means including a coil spring, guides for training said cable around the sides and over the top of a heavy body of cargo positioned on the floor of the vehicle between said guides, an inverted U-shaped bearing frame engaging the top and sides of said body and over which said cable passes, and a winding appliance carried in connection with a stationary part of the vehicle and to which the other end of said cable is connected, said winding appliance serving to draw and maintain said cable in binding engagement with the sides and top of said body to preclude uncontrolled movement of the latter longitudinally and vertically with respect to the floor of the vehicle.

3. Fastening apparatus for securing heavy bodies such as large rolls of sheet metal or paper to the floor of a transporting vehicle during shipment, comprising a cable, means for securing said cable at one end to a stationary part of the transporting vehicle, guides for training said cable around the sides and tops of a plurality of heavy bodies of cylindrical form resting on the floor of the transporting vehicle with their axes in a horizontal plane, bearing frames arranged between the intermediate portions of said cable and the tops and sides of a group of said bodies, means for drawing and maintaining said cable in binding engagement with the grouped cylindrical bodies and bearing frame, and resilient means providing limited longitudinal movement of said bodies in response to inertia forces when said cable is positioned in operative binding engagement therewith.

4. Fastening apparatus for securing heavy bodies such as large rolls of sheet metal or paper to the floor of a transporting vehicle during shipment, comprising a cable, means for securing said cable at one end to a stationary part of the transporting vehicle, guides for training said cable around the sides and tops of a plurality of heavy bodies of cylindrical form resting on the floor of the transporting vehicle with their axes in a horizontal plane, means for drawing and maintaining said cable in binding engagement with the grouped cylindrical bodies, resilient means providing limited longitudinal movement of said bodies in response to inertia forces when said cable is positioned in operative binding engagement therewith, and a substantially rigid bearing frame interposed between said cable and the tops and sides of said rolls.

5. Fastening apparatus for securing heavy bodies to the floor of a transporting vehicle during shipment, comprising a cable secured at one end to a stationary part of the associated transporting vehicle, guides for said cable arranged adjacent to the floor of the vehicle at opposite ends of a heavy body of freight resting on the vehicle floor, a bearing frame extending across the top of said body and downwardly along the sides thereof and with which frame the intermediate portion of said cable is engaged, and means connected with the other end of said cable for placing and maintaining the same under tension whereby to cause the intermediate portion of said cable in contact with said frame to exert binding forces on the sides and top of said heavy body of freight.

6. Fastening apparatus for securing heavy bodies to the floor of a transporting vehicle during shipment, comprising a cable secured at one end to a stationary part of the associated transporting vehicle, guides for said cable arranged adjacent to the floor of the vehicle at opposite ends of a heavy body of freight resting on the vehicle floor, a bearing frame extending across the top of said body and downwardly along the sides thereof and with which frame the intermediate portion of said cable is engaged, means connected with the other end of said cable for placing and maintaining the same under tension whereby to cause the intermediate portion of said cable in contact with said frame to exert binding forces on the sides and top of said heavy body of freight, and resilient means providing for limited movement of said body of freight longitudinally of the vehicle floor when said cable is under tension to absorb primary inertia forces.

7. Fastening apparatus for securing heavy bodies to the floor of a transporting vehicle during shipment, comprising a cable secured at one end to a stationary part of the associated transporting vehicle, guides for said cable arranged adjacent to the floor of the vehicle at opposite ends of a heavy body of freight resting on the vehicle floor, a bearing frame extending across the top of said body and downwardly along the sides thereof and with which frame the intermediate portion of said cable is engaged, and means connected with the other end of said cable for placing and maintaining the same under tension whereby to cause the intermediate portion of said cable in contact with said frame to exert binding forces on the sides and top of said heavy body of freight, said cable guides being adjustably and removably carried in connection with the vehicle floor.

8. Fastening apparatus for securing heavy bodies to the floor of a transporting vehicle during shipment, comprising a cable secured at one end to a stationary part of the associated transporting vehicle, guides for said cable arranged adjacent to the floor of the vehicle at opposite ends of a heavy body of freight resting on the vehicle floor, a bearing frame extending across the top of said body and downwardly along the sides thereof and with which frame the intermediate portion of said cable is engaged, means connected with the other end of said cable for placing and maintaining the same under tension whereby to cause the intermediate portion of said cable in contact with said frame to exert binding forces on the sides and top of said heavy body of freight, and a pawl and ratchet mechanism carried in conjunction with said winding appliances.

9. Fastening apparatus for securing heavy bodies to the floor of a transporting vehicle during shipment, comprising a cable secured at one end to a stationary part of the associated transporting vehicle, guides for said cable arranged adjacent to the floor of the vehicle at opposite ends of a heavy body of freight resting on the vehicle floor, a bearing frame extending across the top of said body and downwardly along the sides thereof and with which frame the intermediate portion of said cable is engaged, and means connected with the other end of said cable for placing and maintaining the same under tension whereby to cause the intermediate portion of said cable in contact with said frame to exert binding forces on the sides and top of said heavy body of freight, the lower portions of said bearing frame terminating in a horizontal plane above that of said guides.

10. Fastening apparatus for lashing heavy bodies of cargo against movement, during shipment, comprising a cable secured to a stationary part of the transporting vehicle, guides for said cable arranged adjacent to the floor of the vehicle on opposite sides of a heavy body of cargo supported by the vehicle floor, substantially rigid united bearing members engaging the top and opposite sides of the body of cargo and over which members the cable is trained, and windlass means cooperative with said cable for placing and maintaining the same under tension, whereby to cause intermediate portions of the cable in contact with said bearing members to exert binding forces on the sides and top of the body of cargo.

VINCENT J. GIBBONS.