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3,061,331

SUPPORT STRAP ARRANGEMENT

Filed July 3, 1959

2 Sheets-Sheet 1

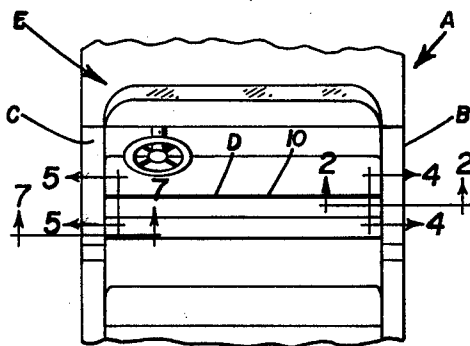


FIG. 1

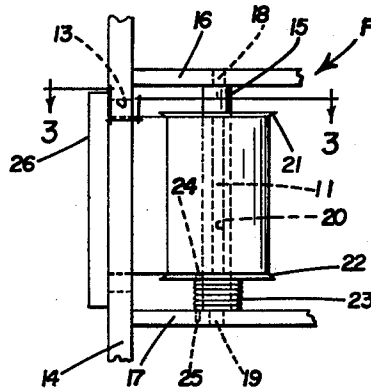


FIG. 2

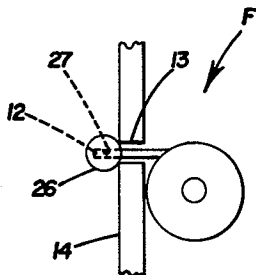


FIG. 3

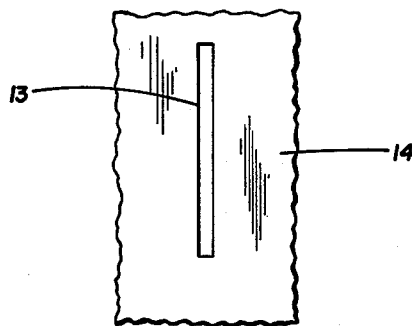


FIG. 4

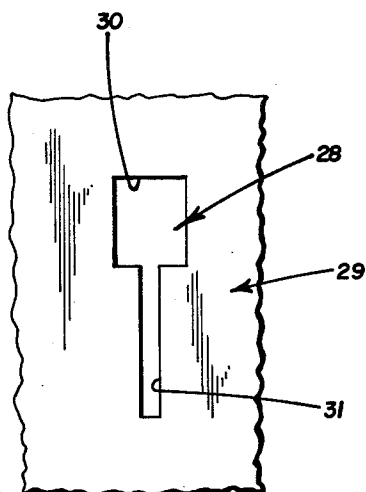


FIG. 5

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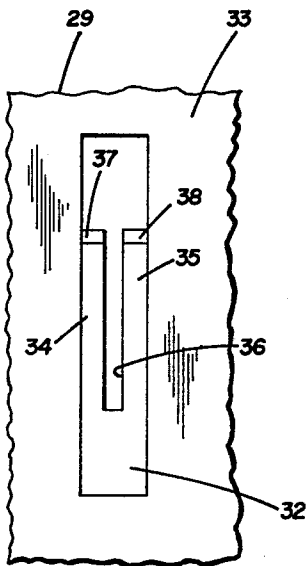


FIG. 6

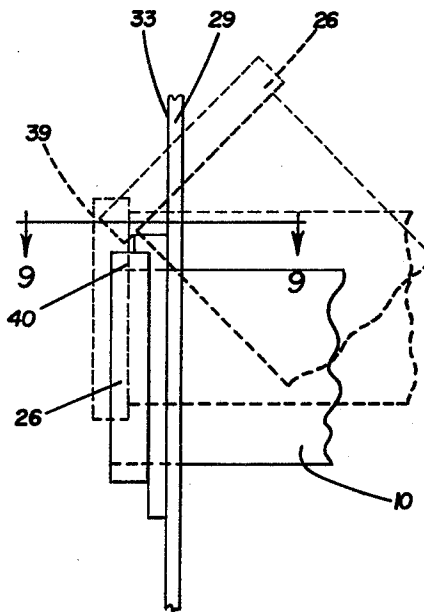


FIG. 7

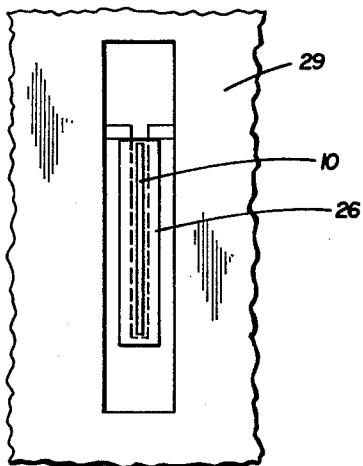


FIG. 8

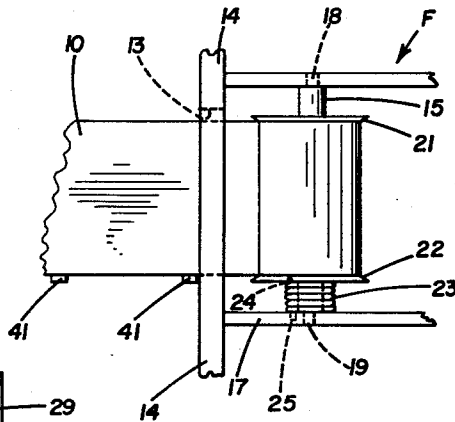


FIG. 10

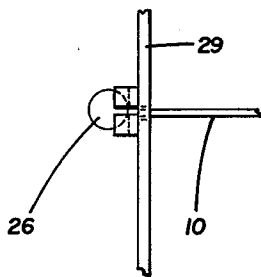


FIG. 9

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SUPPORT STRAP ARRANGEMENT

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4 Claims. (Cl. 280-150)

This invention relates to an improved supporting strap arrangement, and, in particular, this invention relates to an improved supporting strap arrangement for utilization as a safety belt device for vehicles, such as, automobiles, aircraft, boats, and the like; a cargo tie-down or restraining strap device; and the like.

It is well known in the art to provide an elongated support strap having a pair of opposed ends, each end being adapted to be detachably secured to a different portion of a supporting frame structure whereby the secured support strap is adapted to define a confining area or zone between the support strap and the frame structure. In this manner, the secured support strap restrains or limits movement of objects placed in the area or zone defined by the attached support strap.

Various support strap arrangements have been provided for various types of air, land, and sea vehicles wherein one end of the support strap is secured to a wind-up device mounted to one portion of the supporting frame structure of the vehicle whereby the elongated support strap is wound upon the wind-up device when the strap is not being utilized. The other end of the support strap is adapted to be detachably secured to another portion of the frame structure by withdrawing or unwinding the support strap from the wind-up device whereby the secured support strap is utilized to restrain or limit movement of objects placed between the support strap and its associated supporting frame structure.

Accordingly, it is an object of the present invention to provide an improved supporting strap arrangement.

It is another object of the present invention to provide an improved supporting strap arrangement having improved detachable fastening means.

Another object of this invention is to provide an improved supporting strap arrangement having means for selectively limiting movement of the support strap in the wind-up direction thereof.

Other objects, uses and advantages of this invention will become apparent upon a reading of the following specification taken in conjunction with the accompanying drawings forming a part thereof and wherein:

FIGURE 1 is a schematic, top view of a vehicle utilizing the improved supporting strap arrangement of this invention;

FIGURE 2 is an enlarged fragmentary axial cross-sectional view of part of the supporting strap arrangement of FIGURE 1 and is taken on line 2-2 thereof;

FIGURE 3 is a top view of the structure illustrated in FIGURE 2 and is taken on line 3-3 thereof;

FIGURE 4 is an enlarged fragmentary view of a portion of the frame structure illustrated in FIGURE 1 and is taken on line 4-4 thereof;

FIGURE 5 is a view similar to FIGURE 4 and illustrates another portion of the frame structure illustrated in FIGURE 1, FIGURE 5 being taken on line 5-5 of FIGURE 1;

FIGURE 6 illustrates the opposite side of the frame structure illustrated in FIGURE 5;

FIGURE 7 is an enlarged fragmentary axial cross-sectional view of another part of the support strap arrangement illustrated in FIGURE 1 and is taken on line 7-7 thereof;

FIGURE 8 is an end view of the structure illustrated in FIGURE 7;

FIGURE 9 is a top view of the structure illustrated in FIGURE 7 and is taken on line 9-9 thereof; and,

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FIGURE 10 is a view similar to FIGURE 2 illustrating the structure thereof in one of its operating positions.

Reference is now made to the accompanying drawing wherein like reference numerals and letters are used throughout the various figures thereof to designate like parts where appropriate, and particular reference is made to FIGURE 1 illustrating, schematically, a vehicle A having a pair of opposed doors B and C and a supporting strap arrangement D of this invention extending between the doors B and C and secured respectively thereto in a manner hereinafter described. The doors B and C form part of the frame structure of the vehicle A, the frame structure being indicated generally by the reference letter E.

While the various embodiments of this invention are hereinafter disclosed as being utilized as a safety support strap for an automobile, it is to be understood that the supporting strap structure hereinafter described is readily adaptable for use as a safety support strap in other types of vehicles, as well as for utilization as a cargo tie-down or restraining strap arrangement, and the like.

As shown in FIGURE 1, the support strap arrangement D comprises an elongated, flat, narrow, bendable support strap 10 formed of suitable material or materials, such as nylon webbing, leather, plastic, reinforced webbing, and the like. The support strap 10 has a pair of opposed ends, generally indicated respectively by the reference numerals 11 and 12 in FIGURES 2 and 3. The length of the support strap 10 is determined by the particular use thereof, and, in the embodiment illustrated in the drawing, the length of the support strap 10 is slightly greater than the distance between the inside surfaces of the doors B and C as will be apparent hereinafter.

The end 11 of the supporting strap 10 passes through a narrow slot 13 formed in a first portion, generally indicated by the reference numeral 14, of the frame B and is secured to a rotatable wind-up member F. In the particular embodiment illustrated in the drawing, the frame portion 14 comprises an interior door panel usually formed from an upholstered composition board suitably secured to the door frame skeleton and being spaced from the exterior metal panel thereof to provide a space for receiving the associated window when lowered, the window operating mechanism, and the like.

The rotatable wind-up member F includes a shaft or rod 15, rotatably supported between two spaced, parallel support members 16 and 17 respectively secured to the frame E in any suitable manner. The rotatable shaft 15 has a pair of opposed journals 18 and 19 respectively received in suitable bearing apertures formed in the support members 16 and 17 whereby the rotatable shaft 15 is rotatably secured to the frame E.

The end 11 of the support strap 10 may be secured to the rotatable shaft 15 in any suitable manner, and, in the embodiment illustrated in the drawings, the end 11 of the support strap 10 is secured within a slot 20 formed in the shaft 15.

A pair of opposed washer-like collars 21 and 22 are suitably secured to the shaft 15 and are disposed in spaced relation relative to each other to accommodate the width of the support strap 10 in a manner later to be described. A spring 23 is coiled about one end of the shaft 15 and has an end 24 thereof suitably secured to the collar 22 and another end 25 thereof secured to the support member 17. In this manner, the spring 23 tends to rotate the shaft 15 in a wind-up direction whereby the support strap 10 is adapted to be wound upon the shaft 15 between the confining collars 21 and 22 thereof when the support strap 10 is not in use.

The other end 12 of the support strap 10 is secured to a rod or pin 26 in any suitable manner, and, in the em-

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bodiment illustrated in the drawings, the end 12 of the support strap 10 is secured within a slot 27 passing transversely through the pin 12.

Slot means, generally indicated by the reference numeral 28, is formed in a second portion, generally indicated by the reference numeral 29, of the frame E, the frame portion 29 comprising the interior door panel of the door C. The slot means 28 includes a wide upper portion 30 adapted to telescopically receive the pin 26 in a manner later to be described and a narrow portion 31 interconnected with the wide portion 30 of the slot means 28, the narrow portion 31 of the slot means 28 being narrower than the width of the pin 26 for a purpose later to be described.

A keeper or bifurcated member 32 is secured to the rear side 33 of the frame portion 29 in any suitable manner and includes a pair of spaced parallel legs 34 and 35 defining a narrow slot 36 therebetween which is substantially aligned with the narrow slot portion 31 of the slot means 28. A pair of tangs or projections 37 and 38 respectively extend outwardly from the ends of the legs 34 and 35 of the keeper 32, the projections 37 and 38 being disposed intermediate the slot portions 30 and 31 of the slot means 28.

The operation of the supporting strap arrangement D will now be described. Since the spring 23 tends to rotate the shaft 15 in the windup direction, the spring 23 causes the support strap 10 to be continuously wound upon the shaft 15 until the pin 26 is disposed in engagement with the frame portion 14 in the manner illustrated in FIGURE 3. In this manner, the support strap 10 is kept out of the way when not in use and, thus, does not provide the disadvantages present with conventional safety belts.

When it is desired to extend the support strap 10 between the frame portions 14 and 29, the pin 26 is manually grasped and moved toward the frame portion 29 whereby the strap 10 is unwound from the shaft 15 in opposition to the tension force of the spring 23. As shown in dotted lines in FIGURE 7, the lower end 39 of the pin 26 is inserted at an angle through the wide portion 30 of the slot means 28 whereby the end 39 of the pin 26 is projected beyond the tangs or projections 37 and 38 of the keeper 32. The pin 26 is then moved vertically downwardly in the slot means 28 in such a manner that the strap 10 is telescopically received within the aligned narrow slots 36 and 31 of the keeper 32 and slot means 28 respectively. The length of the support strap 10 is so designed that when the pin 26 has been inserted in the slot means 28, only a very short piece of the support strap 10 is still wound on the wind-up member F, the amount of the strap 10 being left on the wind-up member F permitting only slight transverse movement of the spanning support strap 10 whereby impact shock is partially absorbed by the spring 23 and the flexibility of the support strap.

When the upper end 40 of the pin 26 has been moved vertically downwardly below the tangs 37 and 38 of the keeper 32, the pin 26 is moved axially toward the keeper 32 by the force of the tensioning means 23 whereby the pin 26 is forced into engagement with the keeper 32. Since the width of the pin 26 is substantially greater than the width of the slot 36 formed in the keeper 32, the end 12 of the strap 10 is effectively secured to the frame portion 29 of the frame E.

The upper end 40 of the pin 26 is now disposed below the tangs 37 and 38 of the keeper 32 in the manner illustrated in FIGURES 7 and 9 and is prevented from passing around the tangs 37 and 38 by the force of the spring 23. In this manner, upward movement of the strap 10, and thus transverse movement of the support strap 10 in the slot means 28, is prevented by the tangs 37 and 38 of the keeper 32 and the spring 23 whereby the support strap 10 cannot be accidentally detached when a passenger is thrown toward the front of the vehicle A. Ac-

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cordingly, the support strap 10 is firmly secured between the frame portions 14 and 29 of the frame E whereby the support strap 10 forms a suitable safety support strap for the vehicle A.

When it is desired to detach the support strap 10 from the frame portion 29, the support strap 10 is grasped in the region of the frame portion 29 and moved axially toward the frame portion 29 whereby the rigidity of the support strap 10 causes the pin 26 to move axially away from the keeper 32 and whereby the upper end 40 of the pin 26 is moved axially from under the tangs 37 and 38 of the keeper 32. The upper end 40 of the pin 26 can then be removed through the wide portion 30 of the slot means 28 by twisting the support strap 10 angularly with respect to the frame portion 29 whereby the support strap 10 is then detached from the frame portion 29 and is adapted to be automatically wound upon the shaft 15 by the spring 23 in the manner previously described.

Sometimes it is desirable to have the support strap 10 only be partially wound upon the shaft 15 whereby the unwound portion of the support strap 10 can be laid on the car seat and the pin 26 easily grasped by the person sitting adjacent the frame portion 29 of the frame E. A plurality of small projections 41 are secured in spaced relation to the bottom of the support strap 10 and extend therefrom at selected predetermined distances from the pin 26 in the manner illustrated in FIGURE 10. In this manner, when the support strap 10 is being wound upon the wind-up element F, the wind-up action can be terminated by lowering the support strap 10 relative to the slot 13 in the frame portion 14 whereby a selected projection 41 thereof abuts the frame portion 14 and prevents further wind-up movement of the support strap 10. Be merely raising the strap 10 relative to the slot 13, the projection 41 can be permitted to clear the frame portion 14 and pass through the slot 13 whereby continued wind-up movement of the strap 10 is effected by the spring 23.

While the vehicle A is shown as having only one slot means 28 formed in the door C thereof, it is to be understood that a plurality of slots 28 could be provided in spaced relation whereby the pin 26 could be selectively secured in a desired slot means 28. In this manner, the support strap 10 can be adapted to extend a predetermined distance from the seat of the automobile A, depending upon the size of the person utilizing the same or depending on the particular position of the seat relative to the steering wheel.

Further, in the embodiment illustrated in the drawings, it can be seen that the support strap 10 prevents the doors B and C from being accidentally opened when the strap 10 is secured therebetween. Thus, the doors B and C cannot be jarred open while the strap is in use.

While the foregoing presents preferred embodiments of the invention, it is obvious that other modifications and/or equivalents may be employed without departing from the scope of the invention, which is defined in the appended claims.

What is claimed is:

1. In combination, a frame having a first portion and a second portion, an elongated support strap having a pair of opposed ends, means securing one of said ends of said support strap to said first frame portion, said means including tensioning means tending to draw said support strap toward said first portion of said frame, means for detachably securing the other end of said support strap to second portion of said frame whereby said support strap is secured between said frame portions, and means carried by and projecting edgewise from an edge of said support strap engageable with said first frame portion for selectively limiting movement of said support strap toward said first frame portion when said other end of said support strap is detached from said second frame portion, said last-mentioned means comprising a plurality of projections extending outwardly from said support

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strap at predetermined distances from said other end thereof, which projections are adapted to latchingly engage said first frame portion and thus prevent further movement of said support strap toward said first frame portion.

2. In combination, a frame having a first portion and a second portion, an elongated support strap having a pair of opposed ends, means securing one of said ends of said support strap to said first frame portion, a pin secured to the other end of said support strap, means defining slot means in said second frame portion, said slot having a wide portion adapted to telescopically receive said pin and a narrow portion adapted to receive said support strap when said pin is inserted in said slot means and disposed behind said narrow slot portion by moving said support strap longitudinally in said slot means whereby said support strap is detachably secured between said frame portions, and means carried by said second frame portion tending to prevent longitudinal movement of said support strap in said slot means after said pin has been disposed behind said narrow slot portion, said means carried by said second frame portion comprising a bifurcated member secured to said frame adjacent said slot means, said bifurcated member defining a slot aligned with said narrow slot portion and having projections extending outwardly from said second frame portion intermediate said wide and narrow portions of said slot means whereby said projections tend to prevent longitudinal movement of said support strap in said slot means after said pin has been disposed behind said narrow slot portion and on one side of said projections.

3. In combination, a frame having a first portion and a second portion, said second frame portion having a pair of opposed sides, an elongated support strap having a pair of opposed ends, means securing one of said ends of said support strap to said first frame portion, said means including tensioning means tending to pull said support strap away from said second frame portion, a pin secured to the other end of said support strap, means defining slot means through said opposed sides of said second frame

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portion, said slot means having a wide portion adapted to telescopically receive said pin and a narrow portion adapted to receive said support strap when said pin is inserted in said slot means and disposed behind said narrow portion, said narrow slot portion being narrower than the width of said pin, and a keeper secured to said frame and disposed against one of said sides of said second frame portion, said keeper having a narrow slot disposed in aligned relation to said narrow portion of said slot means and having projection means extending away from said one side of said second frame portion, said projection means being disposed intermediate said wide and narrow portions of said slot means whereby said pin is pulled against said keeper by said tensioning means when said pin is disposed behind said aligned narrow slot portions in order to detachably secure said support strap between said frame portions and whereby said projection means of said keeper tends to prevent longitudinal movement of said pin in said slot means.

4. A combination as set forth in claim 3 wherein means are carried by said support strap for selectively limiting movement of said support strap toward said first frame portion when said other end of said support strap is detached from said second frame portion and said tensioning means tends to pull said support strap away from said second frame portion.

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