

Jan. 24, 1967

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3,300,247

PROTECTIVE ABDOMINAL PLATE FOR USE WITH VEHICLE SAFETY BELTS

Filed March 12, 1965

2 Sheets-Sheet 1

Fig. 1

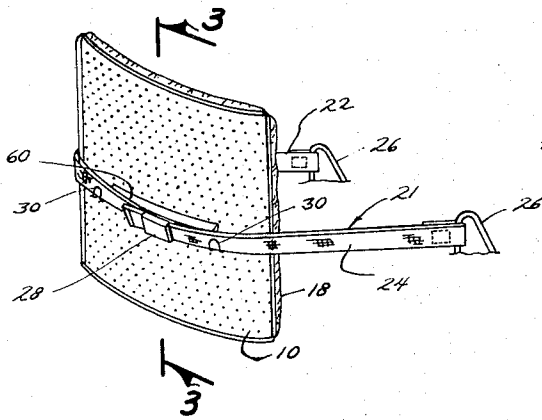


Fig. 3

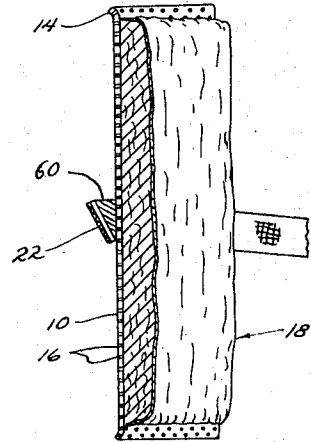


Fig. 2

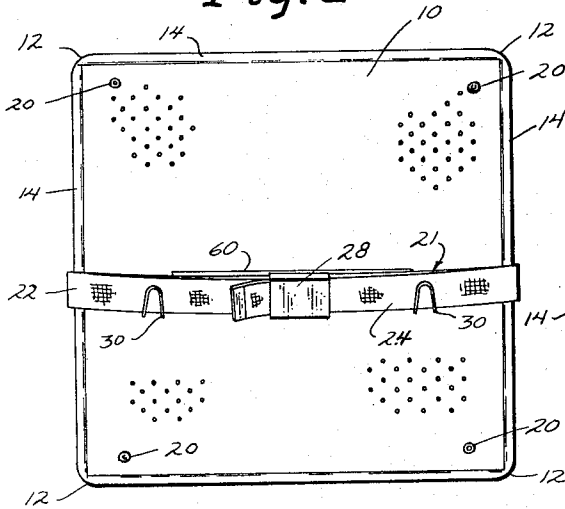


Fig. 4

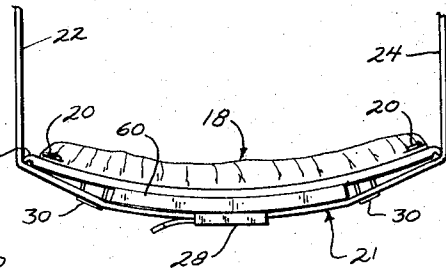
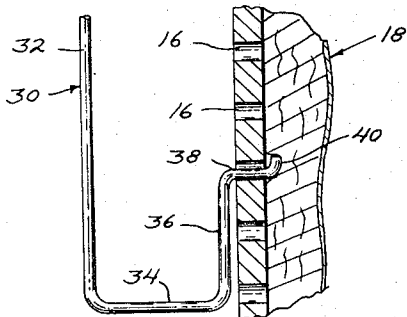


Fig. 5



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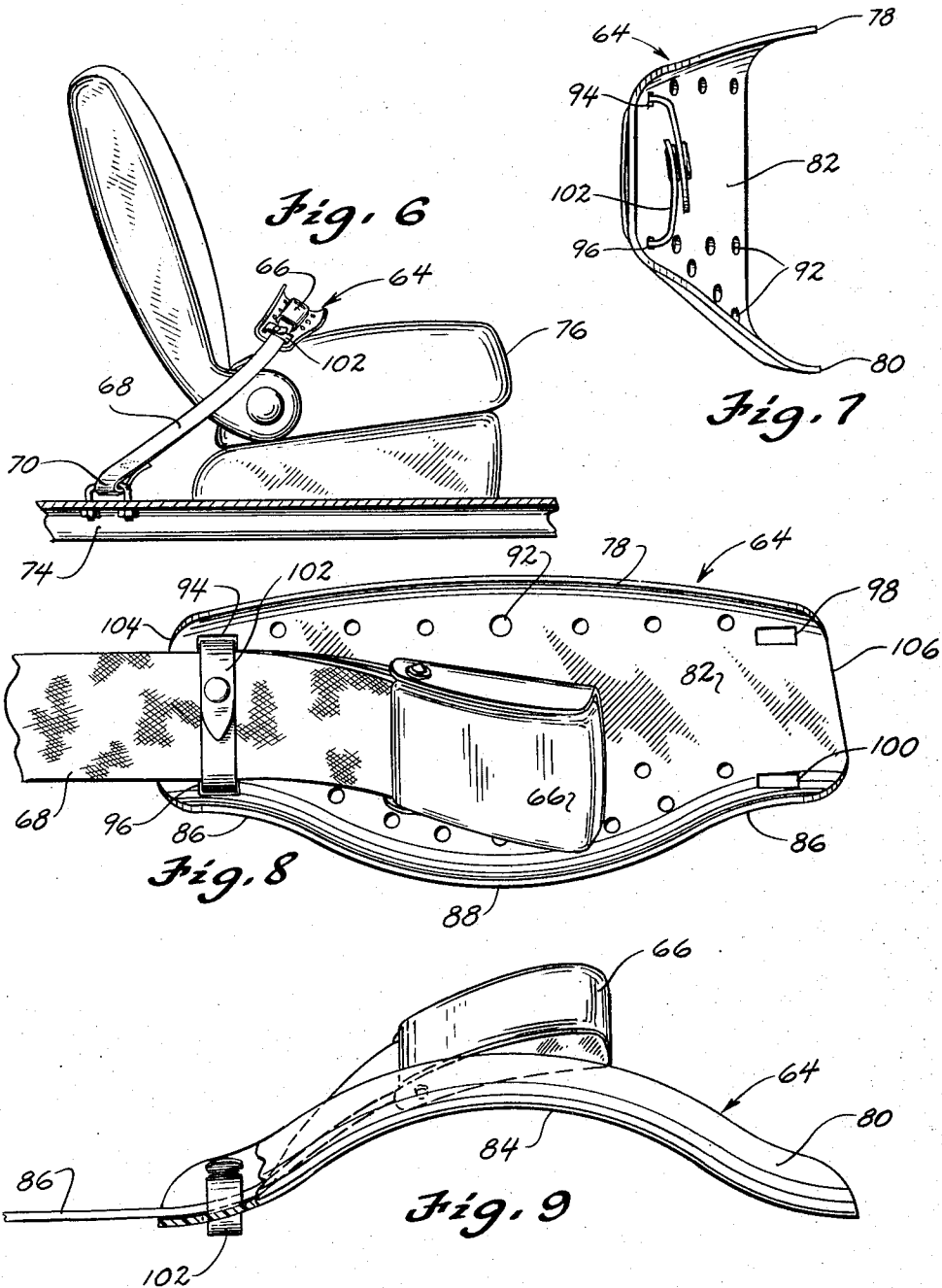
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PROTECTIVE ABDOMINAL PLATE FOR USE WITH VEHICLE SAFETY BELTS

Filed March 12, 1965

2 Sheets-Sheet 2



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**PROTECTIVE ABDOMINAL PLATE FOR USE WITH  
VEHICLE SAFETY BELTS**

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Filed Mar. 12, 1965, Ser. No. 444,898  
2 Claims. (Cl. 297—385)

This is a continuation-in-part application of the applica-  
tions, Serial No. 253,819, filed January 25, 1963, now  
abandoned and Serial No. 392,258, filed August 26, 1964.

This invention relates to vehicle seat belts and in par-  
ticular to a protective plate for placing between the  
abdomen and the seat belt.

When the wearer of a seat belt is thrown forward  
against the belt, the belt and the metal buckle are pulled  
into the abdomen of the wearer and may cause injury.  
Moreover, the seat belt buckle usually made of metal is  
frequently uncomfortable especially if it is held tight  
against the abdomen. Also, the belt and the buckle tend  
to wrinkle the wearer's clothing.

Thus it is one of the principal objects of this invention  
to provide a protective plate which may be positioned  
between the seat belt and the wearer's abdomen to pro-  
tect the wearer against injury caused by the seat belt being  
pulled tight against the abdomen.

It is a still further object of this invention to provide  
a protective plate which may be positioned between the  
seat belt and buckle and the wearer's abdomen to prevent  
the wrinkling of the wearer's clothing.

A still further object of this invention is to provide a  
protective abdominal plate for use with vehicle safety  
belts which is shaped to conform to the wearer's abdomen  
and also to be held in position above and between the  
wearer's legs.

A still further object of this invention is to provide a  
protective abdominal plate for use with vehicle safety  
belts which has a top flange so shaped to prevent injury  
to the wearer upon being thrown forwardly over the plate.

A still further object of this invention is to provide a  
protective abdominal plate for use with vehicle safety  
belts which is so shaped to maintain the seat belt on the  
protective plate at all times.

A related object of this invention is to provide a pro-  
tective abdominal plate for use with vehicle safety belts  
which has means for maintaining ventilation through the  
protective plate.

Another related object of this invention is to provide a  
protective abdominal plate for use with vehicle safety  
belts which is flexible and will thereby bend under stress.  
It is also desired that the protective abdominal plate be  
of a material which is resilient and will return to its  
normal shape upon the removal of the stress forces.

A further object of this invention is to provide a pro-  
tective abdominal plate for use with vehicle safety belts  
which has a means thereon for detachably securing the  
seat belt thereto.

A further object of this invention is to provide a pro-  
tective abdominal plate for use with vehicle safety belts  
which may be detachably secured to the vehicle safety  
belt so that the protective abdominal plate will always be  
within convenient reach of the wearer.

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A further object of this invention is to provide a pro-  
tective abdominal plate for use with vehicle safety belts  
which is simple in design, economical to manufacture and  
refined in appearance.

5 These and other objects will be apparent to those skilled  
in the art.

This invention consists in the construction, arrange-  
ments, and combination of the various parts of the device,  
whereby the objects contemplated are attained as herein-  
after more fully set forth, specifically pointed out in the  
claims, and illustrated in the accompanying drawings, in  
which:

10 FIG. 1 is a perspective view of the device mounted on  
a seat belt. For purposes of clarity, the seat itself has  
not been shown.

15 FIG. 2 is a front view of the device.

FIG. 3 is a sectional view of the device as seen on line  
3—3 of FIG. 1, at an enlarged scale.

FIG. 4 is a top view of the device.

20 FIG. 5 is a partial sectional view of the mounting  
means for the belt hooks of the device.

FIG. 6 is a fragmentary side view of a portion of a  
vehicle illustrating the manner in which the seat belt of  
a modification of the device is secured to the frame of the  
vehicle.

25 FIG. 7 is an end view of a modification of the device.

FIG. 8 is a front view of the modified version of the  
device, and

30 FIG. 9 is a side view of the modified version of the  
device with a portion thereof cut away to more fully  
illustrate the invention.

The numeral 10 generally designates a lightweight plate  
of perforated aluminum or the like. Plate 10 assumes  
the arcuate shape most clearly shown in FIGS. 1 and 4.  
35 The corners 12 thereof are rounded and the peripheral  
edges 14 thereof are curved forwardly. A plurality of  
apertures 16 are located in plate 10 and extend completely  
therethrough. A layer or sheet of porous and fibrous  
padding 18 is secured to the rearward surface of sheet 10  
40 by any convenient means such as by rivets 20 which ex-  
tend through some of the apertures 16.

A conventional seat belt 21 is comprised of belt por-  
tions 22 and 24 which each have their respective rearward  
ends anchored to the vehicle frame by brackets 26. Belt  
portion 22 has a conventional friction-type buckle 28  
45 secured to its forward end. Buckle 28 is adapted to  
receive and hold the forward end of belt portion 24.

Two U-shaped hooks 30 are detachably mounted on  
plate 10. Each hook 30 is comprised of a vertically dis-  
posed loop 32 which has horizontal legs 34 extending to-  
wards the front of the plate 10. Legs 34 are bent up-  
wardly at the face of the plate to form vertical portion  
36. The upper ends of the vertical portions 36 are bent  
rearwardly to form horizontal portions 38 which detach-  
ably extend through pairs of apertures 16 in plate 10.  
50 Hook portions 30 on the rearward ends of the horizontal  
portions 38 extend upwardly to engage the rearward  
surface of plate 10 to present the downward or forward  
movement of the hooks with respect to the plate.

The normal operation of the device seen in FIGS. 1-5  
is as follows:

60 The plate 10 is placed with its bottom edge on or  
slightly above the top of the passenger with the padding

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18 against the passenger's abdomen. The hooks 30 are tilted upwardly and rearwardly to permit hook portions 40 and the horizontal portions 38 to be inserted into plate 10 through pairs of apertures 16. The padding 18 is slightly deflected by the hook portions 40. The hooks 30 are then tilted back to the position shown in FIG. 5. The hooks 30 should be placed substantially as shown in FIG. 2 and at a height most comfortable to the passenger, but preferably below the center of plate 10. An arcuate wedge 60 which is triangular in cross-section and which may be comprised of rubber or the like, is placed against the forward surface of the plate and the belt is tightened against it. The wide edge of wedge 60 is positioned uppermost, as shown in FIG. 3. The belt portions 22 and 24 normally extend rearwardly and downwardly from plate 10 as also shown in FIG. 3.

The plate 10 and padding 18 will serve to distribute the force of belt 21 if the passenger is thrown forwardly against the belt and this serves to prevent the belt from damaging the passenger's internal organs. The forwardly curved edges of the plate 10 also serve to protect the passenger from the edges of the plate. By adjusting the position of hooks 30, the plate 10 can be adapted for use by persons of different size and stature. The wedge 60 causes the tension on belt 21 to hold the weight of the plate upwardly off the lap of the passenger. Aperture 16 in plate 10 and the porous and fibrous padding 18 permit the unit to "breathe" so that the unit will not be uncomfortable to use in warm weather.

With respect to the device seen in FIGS. 6-9, the numeral 64 generally designates the protective abdominal plate. Protective abdominal plate 64 is adapted to be positioned between a person's abdomen and the seat belt buckle 66 on a seat belt 68. The seat belt 68 is secured at each of its ends 70 and 72 (not shown) to the frame 74 of a vehicle. The seat belt 68 extends from behind a vehicle seat 76 across the wearer's abdomen.

The protective abdominal plate 64 is shown to be channel-shaped and having a top flange 78 and a bottom flange 80 interconnected by base portion 82. The entire plate 64 is curved or concave at 84 to conform to the shape of the wearer's abdomen.

The top and bottom flanges 78 and 80 flare outwardly along their lengths relative to the base 82. The top flange 78 is positioned in a substantially flat plane along its length while the bottom flange 80 has an end portion 86 at each end thereof which is concave upwardly in shape and extends longitudinally inwardly and downwardly where the two end portions are interconnected by a third portion 88 which is convex downwardly. The convex portion 88 is placed intermediate the end portions 86 and projects along the contour of the wearer's body over and between the wearer's legs. Similarly, the end portions 86 are shaped to conform to the inner and upper surfaces of the wearer's legs. It is seen that by this shape of the bottom flange 80 that the plate 64 is held securely in a desired position of use.

End edges 104 and 106 of the base portion 82 taper outwardly and downwardly from the top flange 78 to the bottom flange 80 and thereby makes the bottom flange 80 longer than the top flange 78. By this construction, the necessary channel length is provided for the seat belt 68 to maintain it within a channel-shaped plate 64 particularly at its ends. To provide for ventilation through the protective plate 64, a plurality of holes 92 are formed in the base 82. As best seen in FIG. 8, base 82 is provided with a pair of vertically disposed openings 84 and 96 adjacent one of its ends and vertically disposed openings 98 and 100 at its opposite end. Each of the pair of holes just described are adapted to have strap member 102 extending therethrough as seen in the drawings. Strap 102 has conventional fasteners at its free ends. Protective plate 64 may be detachably secured to belt 68 as seen in the drawings so that the protective plate 64 will not become detached from the seat belt. This

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feature assures that the protective plate 64 will always be conveniently located and it will not be necessary for a person to grope around in an attempt to locate the protective plate. The vertically disposed openings at each end of base portion 82 permit the protective plate 64 to be detachably secured to the particular end of the seat belt which has the buckle 66 secured thereto.

The material used in fabricating the protective plate 64 should be flexible and preferably resilient. A plastic material has been found to perform quite satisfactorily. By the material being flexible and resilient, it will not break upon impact during use or storage.

It is obvious that upon the wearer bending forward as in the case of an accident, his abdomen will be protected by the protective plate 64 since the stress forces on the belt 68 will be spread over the substantial area of the protective plate 64. It is also to be noted that the top and bottom flanges 78 and 80 are rounded at their connection to the base 82 and therefore provide a smooth surface for bearing engagement with the wearer's body.

Some changes may be made in the construction and arrangement of my protective abdominal plate for use with vehicle safety belts without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In a protective abdominal plate for use with vehicle safety belts, comprising,
  - a elongated channel member curved along its length to conform to the shape of the wearer's abdominal area,
  - said channel member adapted to be positioned between a seat belt and the wearer's abdomen,
  - said channel member including a base portion,
  - said base portion having first and second substantially vertically disposed openings extending therethrough adjacent at least one of its ends,
  - said first and second openings adapted to receive a strap means extending therethrough,
  - said strap means having fastening means at its ends to enable said strap means and said channel member to be selectively detachably secured to a seat belt.
2. In a protective abdominal plate for use with vehicle safety belts, comprising,
  - a elongated channel member curved along its length to conform to the shape of the wearer's abdominal area,
  - said channel member adapted to be positioned between seat belt and the wearer's abdomen,
  - said channel member having opposite end edges and longitudinal top and bottom flanges extending therebetween for receiving the vehicle safety belt therebetween, said bottom flange having opposite end portions, each of said opposite end portions extending inwardly and downwardly with respect to the channel member end edge adjacent thereto, said bottom flange also having a central portion extending between its inwardly and downwardly extending end portions, said central portion being convex downwardly to fit against and between the legs of the safety belt wearer thereby holding said channel member in position, said top flange extending along its length in substantially a flat plane,
  - said channel member having a base portion extending between said top and bottom side flanges,
  - said base portion having first and second substantially vertically disposed openings extending therethrough adjacent at least one of its ends,
  - said first and second openings adapted to receive a strap means extending therethrough,
  - said strap means having fastening means at its ends to enable said strap means and said channel mem-

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ber to be selectively detachably secured to a seat  
belt.

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