

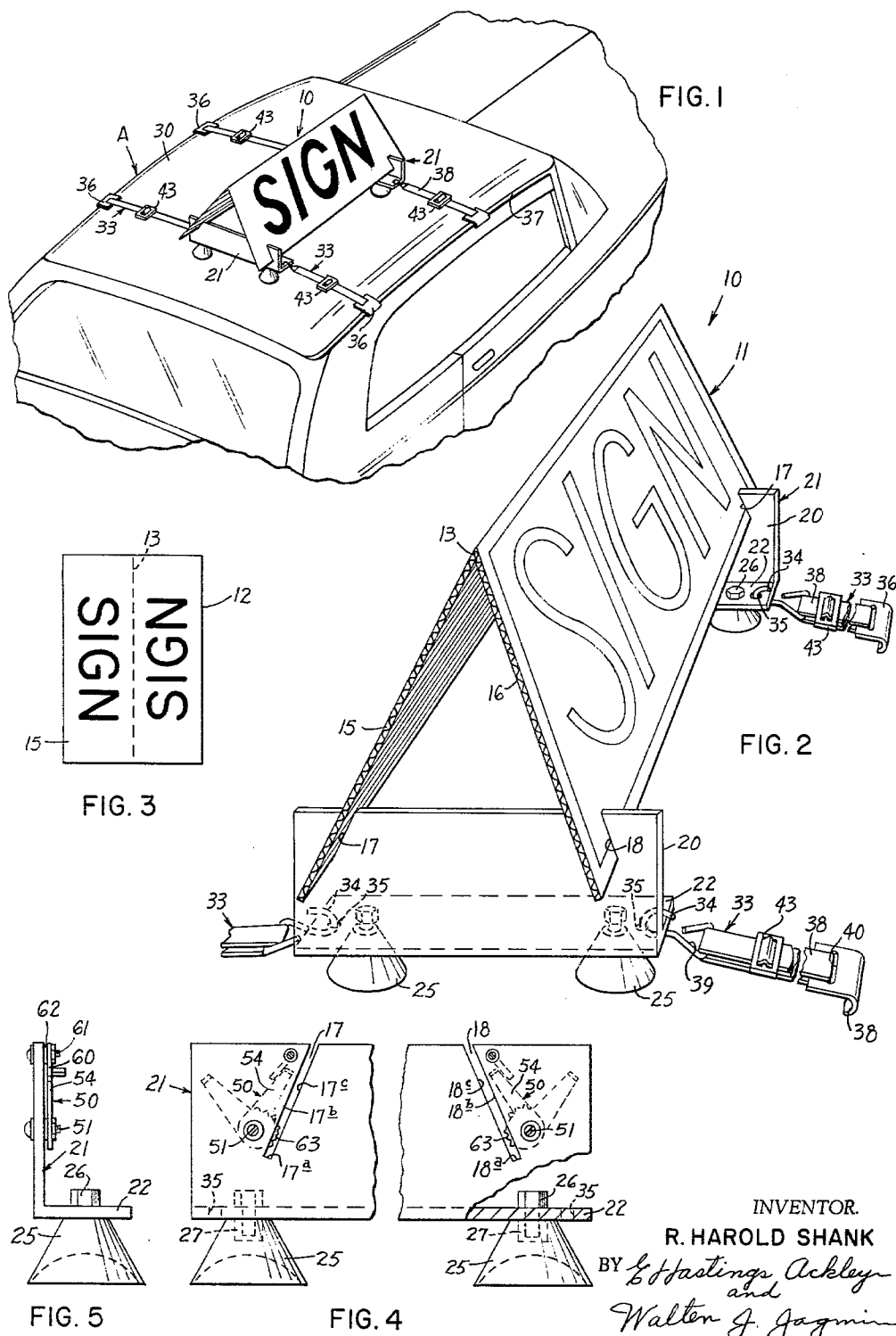
Sept. 28, 1965

R. H. SHANK
DISPLAY DEVICES

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Filed July 18, 1963

2 Sheets-Sheet 1



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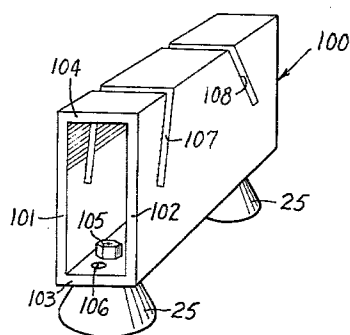
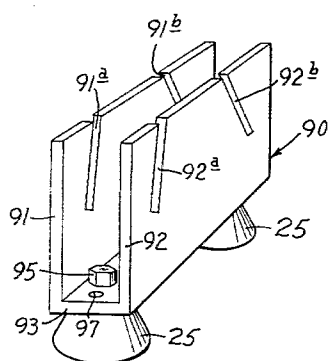
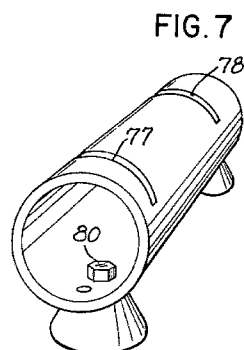
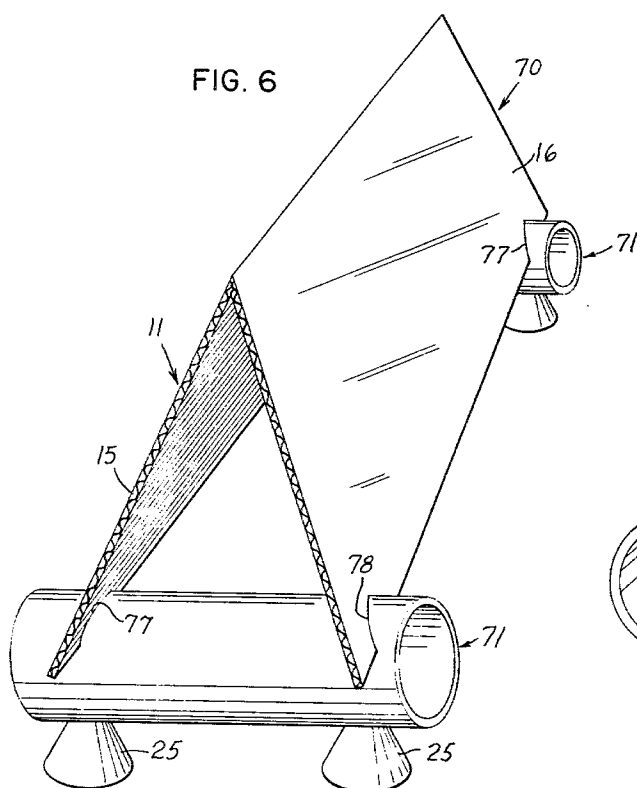
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DISPLAY DEVICES

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7 Claims. (Cl. 40-129)

This invention relates to display devices.

An object of this invention is to provide a new and improved display device which is easily and quickly mountable on a suitable support structure, such as a vehicle.

Another object is to provide a display device which has a minimum of parts and is easily and quickly assembled and secured to a vehicle.

Still another object is to provide a new and improved display device having a sign of inverted V-shape whereby messages carried on opposite planar sections thereof are prominently displayed and having a pair of spaced holders for holding the sign.

Still another object is to provide a sign having planar sections movable about an upper connecting or fold section, longitudinal axis of the lower edge portions of the planar section are receivable in convergently upwardly extending and opening aligned slots of a pair of holders releasably securable to a vehicle whereby the sign presents a minimum of resistance to the air flow during the movement of the vehicle and the resilient force of the sign tending to move its planar sections away from each other about the longitudinal axis holds the sign against displacement from the holders.

A further object is to provide a sign wherein each holder comprises a substantially vertical portion having a pair of upwardly opening and convergent slots and means for securing the holder to a vehicle.

Another object is to provide a sign wherein the holder is substantially L-shaped in cross-sectional configuration and extends transversely relative to the direction of movement of the vehicle, the vertical flange of the holder being provided with upwardly convergent and opening slots for receiving the lower edge portions of the sign.

Additional objects and advantages of the invention will be readily apparent from the reading of the following description of a device constructed in accordance with the invention, and reference to the accompanying drawings thereof, wherein:

FIGURE 1 is a fragmentary perspective view showing the display device of the invention mounted on the roof of an automobile;

FIGURE 2 is a perspective view, with some parts broken away, of the display device illustrated in FIGURE 1;

FIGURE 3 is a planar view of the sign prior to its bending into an inverted V-shape;

FIGURE 4 is a vertical view, with some parts broken away, of a modified form of the holder of the display device;

FIGURE 5 is an end view of the holder illustrated in FIGURE 1;

FIGURE 6 is a perspective view of a modified form of the display device;

FIGURE 7 is a perspective view of the holder of the display device illustrated in FIGURE 6;

FIGURE 8 is a perspective view of a modified form of the holder for the display device; and,

FIGURE 9 is a perspective view of still another form of the holder.

Referring now particularly to FIGURES 1 through 3 of the drawing, the display device 10 includes a sign 11 formed of a rectangular flat blank 12 which may be provided with a longitudinal connecting or fold portion 13 which connects the two planar sections 15 and 16 of

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the sign and which may be defined as the fold or score line along which the sign sections are foldable. The blank 12 may be formed of cardboard, plastic or other suitable substance which is somewhat resilient and resists bending or folding along the score or fold line 13 so that when the two sections 15 and 16 of the sign are folded to form the inverted V-shape structure, illustrated in FIGURES 1 and 2, a resilient force is exerted on the two sections 15 and 16 tending to move them upwardly and outwardly relative to each other along the longitudinal axis of the connecting or fold portion 13. The lower end portions of the planar sections 15 and 16 are received in the upwardly opening and convergent slots 17 and 18, respectively, of the vertical walls or flanges 20 of the holders 21. The two holders 21 are identical in construction and each has a horizontal flange 22 to which are connected a pair of suction cups 25 by means of the screws 26 which extend downwardly through suitable apertures in the horizontal flanges 22 into suitable threaded bores of rigid members 27 molded or bonded in the resilient suction cups.

The pair of holders 21 are mounted parallel to one another and transversely of the roof 30 of the automobile A with the slot 17 of each holder aligned with the slot 18 of the other holder so that the lower portions of the planar section of the sign 11 are each received in longitudinally aligned pair of slots of the two holders.

A pair of belt strap assemblies 33 may be provided for each holder to assist the suction cups in securing the holders to the roof of the automobile. Each strap assembly includes a hook 34 receivable in a suitable aperture 35 in the horizontal flange 22 of the holder 21, a hook 36 engageable with a gutter 37 or other lateral protruding element of the automobile A, and a belt 38 which extends through the loop 39 of the hook 34 and through the slot 40 of the hook 36. The belt may be provided with the usual buckle 43 by means of which the tension on the belt may be adjusted. Each holder may be provided with two of the strap assemblies 33 to secure it to the automobile.

To assemble the device, the flat blank 12 is folded along the fold portion 13 until the lower edges of the two planar sections 15 and 16 thereof are in position to pass downwardly through the upper ends of the upwardly opening convergent slots 17 and 18. The planar sections are then moved downwardly until their downward movement is limited by the lower surfaces 17a and 18a defining the lower ends of the slots 17 and 18, respectively. The planar sections pivot outwardly as they move downwardly into the slots and must also deform or bend during such downward movement, the somewhat resilient substance of which the blank is formed permitting such bending. The blank 12 resiliently resists bending along the fold line 13 so that when the lower end portions of the two planar sections are disposed in the slots of the two holders, the resilient force thereof tends to move the outer surfaces of each of the sections 15 and 16 against the surfaces 17b and 18b defining the outer sides of the slots 17 and 18, respectively. Such resilient force therefore tends to hold the sign against displacement from the holders. Any upward movement of the sign in the slots also would require that the two sections 15 and 16 move toward each other since the slots 17 and 18 converge relative to one another, and would require bending of one planar section or the other and thus the resilient force with which each section resists bending also tends to hold the sign against displacement from the holders.

The slots 17 and 18 may be of a width slightly smaller than the thickness of the substance of which the sign is

made so that when the outer portions of the sections 15 and 16 are inserted into the slots, the sign is slightly compressed and frictionally engages the surfaces 17b and 17c and 18b and 18c defining these slots. Longitudinal movement of the sign through the slots is thus also resisted by this additional frictional force due to the engagement of the sign with the surfaces 17b and 17c and 18b and 18c defining the parallel sides of the slots.

The assembled display device is easily mounted on a supporting structure, such as the roof 30 of the automobile A by positioning the two holders 21 on top of the roof of an automobile A, and then pressing downwardly on the holders to cause their resilient suction cups to engage the roof and secure the holders against displacement from the roof. If desired, a pair of the strap assemblies 33 may then be secured to each holder by inserting their hooks 34 through the apertures 35 of the horizontal flange 22, engaging their hooks 36 with oppositely disposed laterally protruding elements, such as the gutter 37, of the automobile, and placing the belts 38 under tension by means of the buckles 43 to thus help secure each holder to the automobile.

Since the sign extends longitudinally of the automobile, it presents only a thin end edge surface to the air during the travel of the automobile so that even though the automobile may attain high rates of speed, the wind or air resistance of such narrow forward edge portions of the sign is small and the force of the air acting against such very small area of the sign cannot overcome the frictional force holding the sign against movement relative to the holders 21. Any lateral or transverse force applied to either section 15 or 16 is of course resisted by the engagement of these sections with the parallel surfaces defining the slots 17 and 18 and by the frictional engagement of the lower edge of at least one section with the bottom surface 17a and 18a defining the lower end of the slot in which such section is disposed. For example, a lateral or transverse force applied to the outer surface of the section 16 tends to move the section 16 toward the section 17 which requires that the section 16 move upwardly in the slots 17 and 18 in which it is disposed. Any such movement of the section 16 is resisted by the frictional engagement thereof with the parallel sides defining this slot. Any such movement of the section 16 also tends to move the section 15 downwardly as well as outwardly and such movement of the section 15 is resisted not only by the frictional engagement of its sides with the parallel surfaces defining the slots in which it is disposed but also by the engagement of its lower edge with the surfaces 17a and 18a defining the lower end of the slots in which the section 15 is disposed. The sign is thus held against displacement from the holders even though the automobile may travel at high speeds and the sign be subjected to laterally as well as longitudinally acting wind forces.

It will now be seen that a new and improved display device of extremely simple construction which is easily and quickly assembled and installed on a vehicle, such as on the roof of an automobile, has been illustrated and described and that it includes a sign of an inverted V-shape which extends longitudinally of the automobile and a pair of holders spaced longitudinally along the roof and extending transversely thereof, each of the holders being provided with a pair of upwardly opening and convergent slots in which are receivable the lower outer portions of the two downwardly and outwardly divergent sections of the sign.

It will further be seen that such section of the sign is frictionally engaged by the holders and held against longitudinal, lateral and upward displacement relative to the holders.

It will further be seen that the holders are securable to the roof by means of suction cups and, if desired, also by strap assemblies and that such securing means

do not require the alteration or modification of the automobile in any manner.

Referring now particularly to FIGURES 4 and 5, the holders 21 may, if desired, be provided with latches 50 pivotally secured by means of bolts 51 to the vertical flange 20 of each holder. Each latch has a serrated or toothed outer surface 53 which is eccentric relative to the axis of its bolt 51 so that when each latch 50 is rotated from the position illustrated in broken lines in FIGURE 4 to its full line position, its serrated surface 53 is between the parallel surfaces 17b and c or 18b and c as the case may be and thus is in engagement with the outer surface of the sign section dispersed in such slot. The latches have handles 54 by means of which they may be pivoted. The latches may be held in their operative positions by friction locks 60 whose upper ends are pivotally secured to the horizontal flange 20 by means of the bolts 61. Each bolt 61 extends through aligned apertures in the vertical flange 20, and the friction washer 62 and through the nut 63 so that the force with which the lock is held against movement may be adjusted by varying the position of the nut on the bolt 61.

In use, when it is desired to install the sign 11 on a holder 20 provided with the latches 50, the locks 60 are pivoted out of engagement with the handles of the latches which are then rotated to move their serrations out of alignment with the slots. The lower edge portions of the sign are then inserted downwardly into the slots 17 and 18 and as they approach the surfaces 17a and 18a defining the lower ends of the slots, the latches are rotated in opposite directions to move their serrated surfaces 53 into engagement with the outer sides of the sections downwardly in the slots. At the same time, the serrated surfaces engage the outer sides of the section and hold them against upward movement. When the sections are in their innermost positions, the locks 60 are pivoted into engagement with the handles 54 of the latches to hold them against accidental movement in opposite directions releasing the sign for movement out of the slots. The latch now holds the sign against movement relative to the holders.

Referring now particularly to FIGURES 6 and 7, the display device 70 includes a pair of holders 71 of modified form. Each holder 71 includes a cylindrical body 72 provided with upwardly opening and convergent recesses 77 and 78 in which are received the lower portions of the sections 15 and 16 of the sign 11. Each holder includes a pair of suction cups 25 secured to its lower surfaces by means of the screws 80 which extends through suitable recesses in the tubular member into threaded bores of the rigid members 27 of the suction cup. The body ring also may have an aperture 81 adjacent each end in which is receivable the hook 34 of a strap assembly 33.

FIGURE 8 shows a holder 90 which is of channel shape having a pair of parallel vertical flanges 91 and 92 and a lower horizontal web 93 to which are secured the suction cups 94 by means of bolts 95 which extend through suitable apertures in the web. The vertical flanges 91 and 92 are provided with aligned upwardly opening and converging slots 91a and 91b and 92a and 92b, respectively. It will be apparent that one section, for example, the section 15 of the sign 11 is receivable in the aligned slots 91a and 92a of the holder and the other section 16 is receivable in the slots 91b and 92b so that the sign is held in its inverted V-shape position by the holders. The web may also have an aperture 97 adjacent each end to receive a hook 34.

The holder 100 illustrated in FIGURE 9 is of substantially rectangular shape, having a pair of spaced vertical walls 101 and 102, a bottom wall 103, and a top wall 104. The suction cups 25 are secured to the bottom wall by means of the bolts 105 which extend through suitable apertures in the bottom wall. The bottom wall 103 is also provided with an aperture 106 adjacent each end for receiving the hook 34 of a strap assembly 33. The holder

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has upwardly opening and convergent slots 10 and 107 which extend through the top wall and through the vertical walls 101 and 102 in which are receivable to the sections 15 and 16 of the sign.

It will now be apparent that each of the different forms of the holders has a pair of upwardly opening and convergent slots for receiving the downwardly divergent planar sections 15 and 16 of the sign 11 and holds the sign securely.

The foregoing description of the invention is explanatory only, and changes in the details of the construction illustrated may be made by those skilled in the art, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. A display device mountable on a vehicle including: a sign having a pair of planar sections and means connecting upper adjacent edges of said planar sections, said sections extending divergently downwardly from said connecting means, said connecting means resiliently biasing said planar sections upwardly and away from each other; and a pair of spaced holders rigidly securable to a vehicle in longitudinally spaced relationship relative to the vehicle, each of said holders having a pair of spaced upwardly opening and convergent slots, said planar sections having portions positioned in said slots.

2. A display device mountable on a vehicle including: a sign having a pair of planar sections movable downwardly toward each other and connected to each other along a longitudinal fold line of said sign to positions wherein said sections extend divergently downwardly relative to each other from said fold line and have longitudinal edges parallel to and spaced from each other; a pair of holders rigidly securable to a vehicle in longitudinally spaced relationship relative to the vehicle extending transversely relative to said sign, each of said holders having an upwardly extending vertical planar member provided with a pair of spaced upwardly opening and convergent slots, the slots of said holders being aligned, said planar sections having lower portions disposed and held in said slots, said planar sections including means at the line of connection to bias them upwardly about said fold line and away from each other when said lower portions are disposed in said slots.

3. The device of claim 1, wherein each of said holders includes a tubular member, said slots being provided in said tubular member.

4. The device of claim 2, wherein each of said holders includes a channel member having a horizontal web and a pair of spaced vertical flanges extending upwardly from said web, said slots being provided in said flanges.

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5. The device of claim 2, wherein each of said holders includes a tubular member of rectangular cross-sectional configuration having horizontal top and bottom walls and spaced parallel vertical walls extending between said top and bottom walls, said slots being provided in said top and vertical walls.

6. The device of claim 2, and latch means movably secured on said vertical planar member and engageable with said sections when said sections are in said slots for releasably holding said sections against movement relative to said holder.

7. A display device mountable on a vehicle including: a longitudinal extending sign having a pair of planar sections and means connecting upper adjacent edges of said planar sections, said planar sections extending divergently downwardly from said connecting means and laterally outwardly of the longitudinal axis of said sign and mounting means rigidly securable to a vehicle for holding said sign in longitudinal alignment with the vehicle, said mounting means having transversely spaced slots, said planar sections having lower edge portions remote from said connecting means releasably held in said slots, said connecting means biasing said planar sections upwardly and away from one another when said lower edge portions are disposed in said slots.

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