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PANEL HANGER

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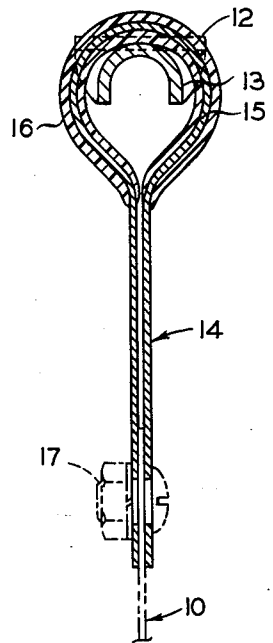
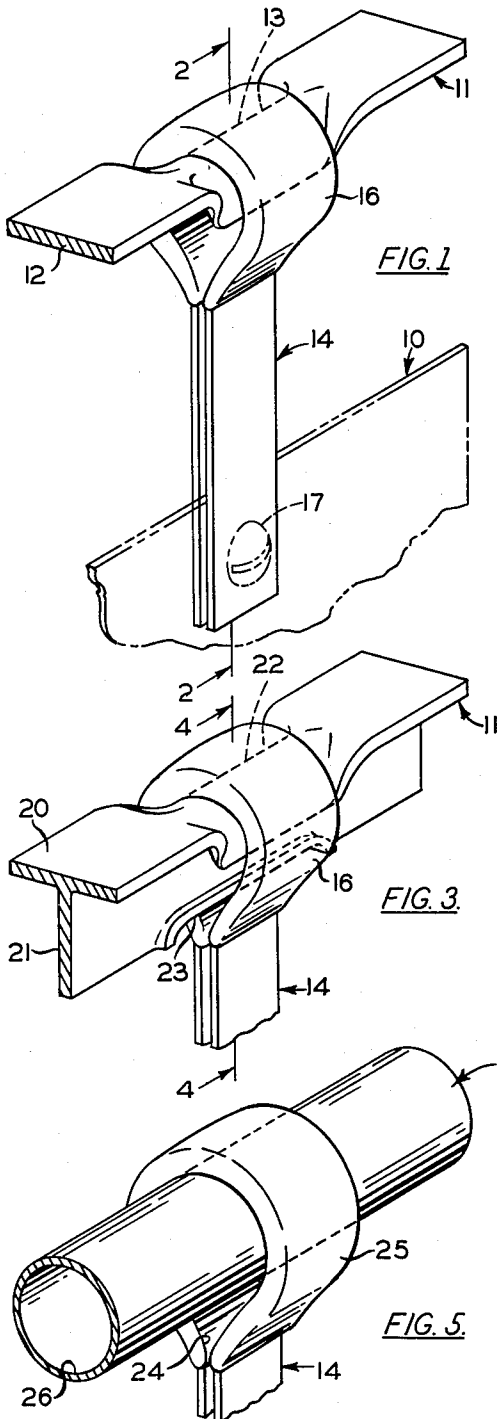


FIG. 2

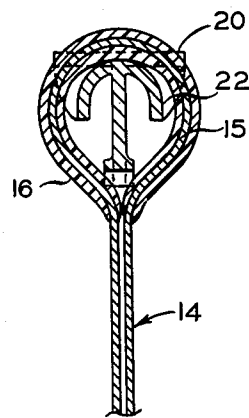


FIG. 4

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This invention relates generally to improvements in a hinge, and more particularly to improvements that provide a silent hinge adapted to support a swinging panel such as a sign.

It is an important objective to provide a novel hinge that is specifically adapted to support a panel such as an advertising sign on a substantially horizontal support member, the hinge permitting the sign to swing freely in an oscillating movement about a horizontal axis. In the usual construction, a pair of spaced hinges are used to attach a vertical sign to a horizontal support member.

Heretofore signs of this general type would cause considerable noise while being swung back and forth in a breeze, such noise being caused primarily by frictional binding between the component hinge parts utilized to support the sign. An important object is achieved by the provision of a hinge structure that eliminates or minimizes to the greatest extent possible the formation of rust between the hinge parts which is one of the primary causes of well known squeaking noises, and otherwise reduces objectional frictional effects.

Another important object is realized by using a support bar that includes an elongate flat strip, and shaping a short length of the strip by bending down opposite sides to form an arcuate bearing for a hinge strap. The strap is provided with an eye through which the bar extends and which is mounted hingedly on the arcuate bearing.

Still another important objective is achieved in that the structure of the support bar and its cooperation with the strap eye provides the dual function of accurately locating and retaining the hinge strap at a specific region on the bar and also affording an efficient bearing for the swinging strap.

Other important advantages are achieved by making the strap eye expansible so that the support bar can be inter-fitted, and by having the width of the bar strip greater than the inside dimension of the strap eye when the eye is closed incident to attachment to a sign panel. This structural arrangement causes the strip to abut each end of the strap and thereby locate and retain the strap on the arcuate bearing.

Yet another important objective is realized in providing a support bar that consists of a T-shaped member, the upper flat strip portion of which is bent down at opposite sides at specific locations to provide arcuate bearings. The T-shaped bar affords increased rigidity and strength where needed for the mounting of a hinged panel.

Another important object is obtained by coating the strap eye with a suitable plastic material that is extremely durable, the plastic material engaging the arcuate bearing on the support bar as the strap oscillates during swinging movement of the sign panel. Because of the inherent quality of such plastic material, rust is eliminated on the strap eye, friction is considerably reduced between the strap and bearing, and the hinge operates smoothly and noiselessly.

An important object is to provide a hinge that is simple and durable in construction, economical to manufacture and assemble, efficient in operation, and which can be readily installed by any one with only a minimum of instruction.

The foregoing and numerous other objects and advantages of the invention will more clearly appear from the

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following detailed description of a preferred embodiment and several modifications thereof, particularly when considered in connection with the accompanying drawing, in which:

FIG. 1 is a perspective view of one embodiment of the hinge, illustrating the hinge strap attached to a sign panel;

FIG. 2 is a cross sectional view as seen along line 2—2 of FIG. 1;

FIG. 3 is a perspective view of a modified hinge;

FIG. 4 is a cross sectional view as seen along line 4—4 of FIG. 3, and

FIG. 5 is a perspective view of another modified hinge.

Referring now by characters of reference to the drawings, and first to FIGS. 1 and 2, it is seen that the particular hinge structure is adapted to support a vertical panel indicated at 10. For example, many types of advertising signs are hingedly carried and supported on a horizontal support member, the sign depending from the support member in a vertical plane. Usually, these signs are mounted to the support member by a plurality of hinges that allow the signs to swing back and forth.

The horizontal support bar referred to at 11 consists of a flat elongate strip 12. At specific locations in the strip 12, opposite sides of the strip 12 are turned or bent downwardly to provide an arcuate bearing 13. The width of the arcuate bearing 13 is less than the width of the immediately adjacent flat strip 12 from which it is formed. One of these arcuate bearings 13 is formed on strip 12 wherever it is desired to provide a hinge mounting for sign 10.

A strap generally referred to at 14 is constructed of a flat strip stock, the strap 14 being folded back on itself to provide an enlarged eye 15. The remaining portion of the strap 14 extends downwardly from the eye 15 in closely adjacent parallel relation.

To provide a silent hinge, or in other words a hinge that makes very little, if any, noise upon relative movement of the component hinge parts, the strap eye 15 is coated with a plastic layer 16. This plastic layer 16 engages the arcuate bearing 13 and enables the strap 14 to swing effortlessly and noiselessly on such bearing 13. It is apparent that the provision of such a plastic layer 16 on the strap eye 15 prevents the formation of rust on the eye, and greatly reduces the friction between the strap eye 15 and arcuate bearing 13.

Under some circumstances it is desirable to place graphite in the plastic mix into which the strap eye 15 is dipped incident to forming the plastic layer 16. The graphite in the plastic further lubricates the frictional surfaces between the strap eye 15 and arcuate bearing 13 to provide even greater ease in the oscillation of the strap 14, and consequently further reduces any noise caused by friction. However, because of the inherent qualities of the plastic in affording the advantageous functional results described previously, it is not usually necessary to place graphite in the plastic layer 16. Under most circumstances, the plastic layer itself will accomplish the desired results.

The ends of the strap 14 can be pulled apart to expand the strap eye 15 to permit the insertion of the strip 12 and thereby enable the strap eye 15 to be positioned on the arcuate bearing 13. After location of the strap eye 15 on bearing 13, the sign 10 is placed between the ends of the strap 14, and secured in place by nut and bolt connection 17. As the strap ends are secured to sign 10, the strap eye 15 is closed to the greatest extent possible. This action locks the strap eye 15 in place on the arcuate bearing 13. It will be importantly noted that the width of the strip 12 immediately adjacent the arcuate bearing 13 is greater than the inside dimension of the strap eye

15. Moreover, the length of the arcuate bearing 13 is slightly longer than the length of the strap eye 15 swiveled on such bearing. The strip 12 at each end of the arcuate bearing 13 abuts the strap eye 15 to hold the strap eye on the bearing 13 and thereby retain the strap 14 in the desired location on the support bar 11. Of course, the outer dimension of the arcuate bearing 13 is less than the inside dimension of the strap eye 15 so that the strap 14 can be swiveled freely while supporting sign 10.

The particular structure of the strip 12 in forming the arcuate bearing 13 for the strap 14 performs a dual function. First, such formation acts as a locator for strap 14. In other words, the formation retains the strap 14 at a particular location on the support bar 11. Secondly, such formation provides an arcuate bearing for the strap eye 15.

A modified embodiment of the hinge is disclosed in FIGS. 3 and 4. The strap 14 utilized in this hinge is of the same construction as the hinge previously described with respect to FIGS. 1 and 2, and therefore the elements of the strap 14 are given identical reference numerals. For example, the strap 14 of FIGS. 3 and 4 includes a strap eye 15 covered with a plastic layer 16.

The support bar 11 of FIGS. 3 and 4 is substantially T-shaped in cross section, the bar including a flat horizontal top strip 20 and in integral depending leg 21.

At specific locations along the support bar 11, the top strip 20 is turned downwardly at opposite sides of the leg 21 to provide an arcuate bearing 22. At the same time that the arcuate bearing is formed, the lower margin of leg 21 immediately below the bearing 22 is jammed upwardly to provide a recess 23.

The width of the arcuate bearing 22 is less than the width of the top strip 20 from which it is formed and is less than the inside dimension of strap eye 15 when such strap eye is closed. In addition, the length of the arcuate bearing 22 is slightly longer than the length of the strap eye 15 so that the top strip 20 immediately adjacent the bearing 22 abuts the opposite ends of the strap eye 15 to hold the strap eye 15 on bearing 22 and to locate the strap 14 at the particular region desired for the hinge mounting on support bar 11.

The recess 23 formed in the bottom of the leg 21 is adapted to receive the strap eye 15 as the strap 14 oscillates. The height of leg 21 immediately adjacent the ends of the recess 23 is slightly greater than the inside dimension of strap eye 15 so that the leg portions defining the ends of the recess 23 abuts the opposite ends of strap eye 15 to retain the strap eye 15 in place on the arcuate bearing 22. It is seen that the leg 21 assists the top strip 20 in holding the strap 14 in place. Again, the specific formation of support bar 11 performs the function of acting as a locator for strap 14 and of providing a bearing on which the strap 14 is swiveled.

A similar strap 14 is illustrated in FIG. 5. This strap 14 of FIG. 5 is provided with an eye 24 of greater dimension than the strap eye 15 disclosed in FIGS. 2 and 4. Of course, the strap eye 24 is provided with the same type of plastic layer 25. In this modification embodiment, the support bar 11 consists of a tubular pipe 26 adapted to extend through the strap eye 24. Because of the inherent quality of the plastic layer 25 engageable with the bearing surface provided by the circular periphery of tubular pipe 26, the strap 14 oscillates freely with little or no noise while carrying a vertical panel such as a sign.

Means (not shown) extending outwardly from the pipe 26 abuts opposite ends of the strap eye 24 to hold the strap eye in a desired location on the support bar 11.

It is thought that the operation and functional results of the hinge embodiments have become fully apparent from the foregoing detailed description of parts, but for completeness of disclosure, the assembly and the operation of the hinges disclosed in FIGS. 1-4 inclusive will be briefly described.

In each of the above mentioned embodiments, the strap

14 is spread apart to enlarge the strap eye 15 to permit the insertion of the support bar 11 and the location of the strap eye 15 on the arcuate bearing 13 (FIG. 1) or 22 (FIG. 3). The sign panel 10 is placed between the lower ends of the strap 14 and is secured by the bolt and nut connection 17. Upon clamping of the sign panel 10, the strap eye 15 is closed. Because of the structural arrangement of the support bar 11 with the strap eye 15, the strap eye 15 is held in position on the arcuate bearing, yet is permitted to swivel freely as the sign panel 10 swings back and forth while being supported on the horizontal support bar 11.

Although the invention has been described by making detailed reference to a preferred embodiment and modifications thereof, such detail is to be understood in an instructive, rather than in any restrictive sense, many variants being possible within the scope of the claims hereunto appended.

I claim as my invention:

1. A support bar including an elongate horizontal sheet strip, said strip having an arcuate portion extending downwardly at opposite sides of the strip to provide an arcuate bearing, and a strap provided with a rounded eye that receives said bar and swivels on said arcuate bearing, the width of said strip at each end of the arcuate portion being greater than the inside dimension of said strap eye and thereby abuttingly prevents axial removal of the strap eye from the arcuate bearing.

2. An elongate support bar including an elongate sheet strip, and a strap provided with a rounded eye, said strap being expansible to interfit said bar in said strap eye, means securing the ends of said straps to close said eye, the strip having an arcuate bearing engageable by said strap eye, the width of said strip at each end of the arcuate bearing being greater than the inside dimension of said strap eye when the strap eye is closed and thereby abuttingly prevents axial removal of the strap eye from the arcuate bearing, the length of said arcuate bearing being slightly longer than the length of said strap eye, said strap eye being swiveled on said arcuate bearing.

3. An elongate support bar consisting of an elongate sheet strip, said strip having an arcuate portion extending downwardly at opposite sides to provide an arcuate bearing, the strip at each end of said arcuate portion being substantially flat and horizontal and being of greater width than said arcuate portion, a strap provided with a rounded eye, said strap being expansible to interfit said eye on said arcuate bearing, means selectively securing the ends of said strap to close said strap eye, the width of said strip at each end of said arcuate portion being greater than the inside dimension of said strap eye when the strap eye is closed and thereby abuttingly prevents axial removal of the strap eye from the arcuate bearing, and the length of said arcuate bearing being slightly longer than the length of said strap eye.

4. An elongate support bar substantially of T-shape in cross section, said bar including a top strip and a depending leg, said top strip having an arcuate portion at opposite sides of the depending leg to provide an arcuate bearing, and a strap provided with a rounded eye that receives said bar, said strap eye being swiveled on said arcuate bearing, the length of said arcuate bearing being slightly longer than the length of said strap eye, the top strip adjacent the arcuate bearing being engageable with each end of the strap eye to retain the strap eye on said arcuate bearing.

5. An elongate support bar substantially of T-shape in cross section, said bar including a top strip and a depending leg, said top strip having an arcuate portion at opposite sides of the depending leg to provide an arcuate bearing, a strap provided with a rounded eye, said strap being expansible to place said eye around said bar, said strap eye being swiveled on said arcuate bearing, and means securing the ends of said strap to close said eye, the width of said top strip being greater than the inside

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dimension of said strap eye when the strap eye is closed, the length of said arcuate bearing being slightly longer than the length of said strap eye, the strip immediately adjacent the arcuate bearing being engagable with each end of the strap eye to retain the strap eye on said arcuate bearing.

6. An elongate support bar substantially of T-shape in cross section, said bar consisting of a top strip and a depending leg, said top strip having an arcuate portion at opposite sides of said leg to provide an arcuate bearing, a strap provided with a rounded eye, said strap having ends that are expansible to enlarge said strap eye to interfit said strap eye over said bar, and means securing the ends of said strap to close said eye, the width of said top strip being greater than the inside dimension of said strap eye when the strap eye is closed, the said leg having its bottom margin provided with a recess immediately below said arcuate bearing, the length of said arcuate bearing and said recess being slightly longer than the length of said strap eye, the top strip immediately adjacent the arcuate bearing and the leg at each end of the recess

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being engagable with each end of the strap eye to retain the strap eye on said arcuate bearing.

7. The combination and arrangement of elements as recited above in claim 6, but further characterized by the provision of a plastic layer on the strap eye engagable with the bar, said plastic layer reducing rust, reducing friction between the strap and bar, and reducing noise as the strap swivels on said bar.

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