Feb. 28, 1950 M. SEIDE 2,498,716

DETENTION SCREEN SUSPENSION

Filed Dec. 31, 1945

Fig-7

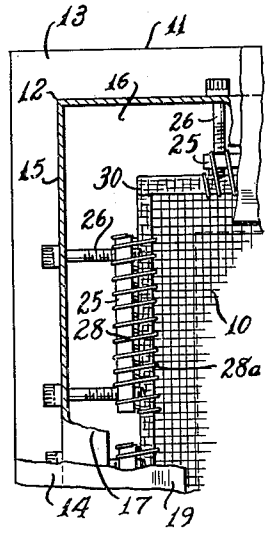


Fig-5

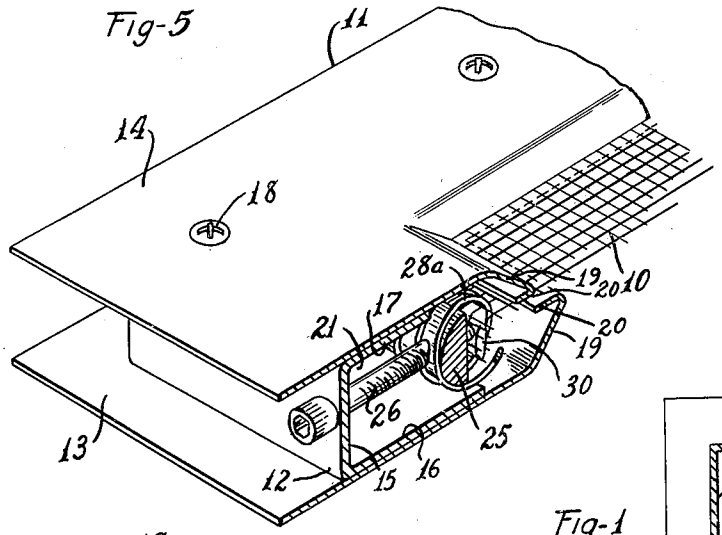
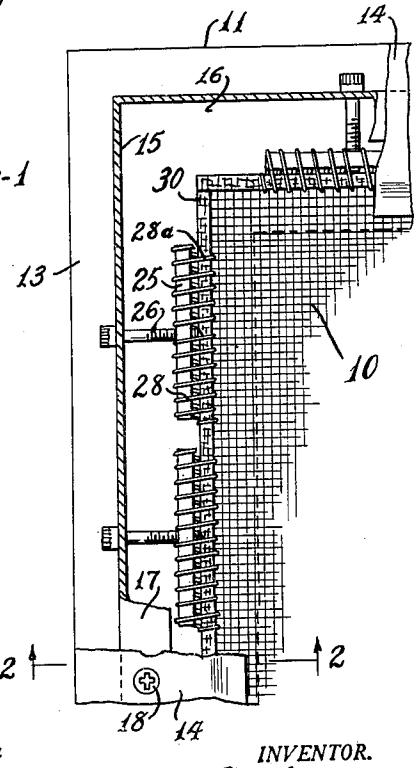


Fig-1



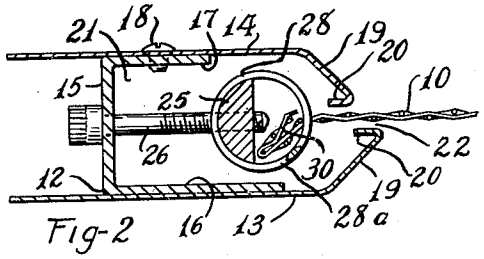


Fig-2

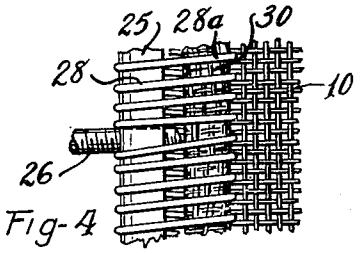


Fig-4

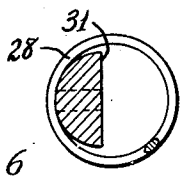


Fig-6

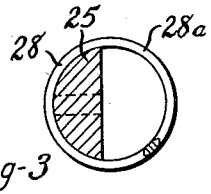


Fig-3

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DETENTION SCREEN SUSPENSION

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7 Claims. (Cl. 160—378)

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The invention relates generally to screens for window or door openings, and more particularly to mounting or supporting means for strong and heavy detention screens such as are used in hospitals, psychiatric institutions, or places of detention.

It is quite desirable that screens of this character be of sufficient strength to withstand severe shocks without failure, so as to prevent inmates or patients from accidentally falling therethrough, or even from intentionally hurling themselves against or through the screen to effect an exit. It is further desirable that a detention screen be of such strength, and be mounted or suspended in such manner, that the patient is unable to rupture or break the screen panel by subjecting it to blows from any portable object in the room.

It is greatly to be desired that the screen alone be the only object in the window opening, other than a normal glazed window sash, thereby avoiding all indications of restraining means such as bars, so that mental patients are not disturbed by evidences of confinement.

The inherent physical strength of the screen panel is of course an important factor in its resistance to impacts of the character mentioned above. It has been heretofore determined that such inherent strength and impact resistance are greatly augmented by providing a floating but resilient attaching and supporting means. The yieldable mounting thus provided serves to absorb and cushion sudden and severe shocks without tearing of the screen panel.

An object of the present invention is to provide novel and improved suspension means for a screen panel whereby shocks received by the panel are cushioned more evenly, and consequently are absorbed more efficiently, than by other means heretofore known or available.

A further object of the present invention is to provide screen panel suspension means as characterized in the last preceding paragraph, which means is inherently simple and easy to make up and assemble, thereby greatly reducing the total cost of fabrication and installation of the screen.

These and other objects and features of the invention are hereafter more fully described and claimed, and the preferred character of construction of a screen embodying my invention is shown in the accompanying drawings in which:

Fig. 1 is a fragmentary front elevation, partially broken away to expose interior parts;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a sectional detail view of a portion of

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a screen supporting element such as shown in Figs. 1 and 2;

Fig. 4 is an enlarged view of a portion of the structure shown in Fig. 1;

Fig. 5 is a fragmentary perspective view of the embodiment of the invention shown in Figs. 1 to 4;

Fig. 6 is a sectional view similar to Fig. 3, but showing a slightly modified form thereof;

Fig. 7 is a detail view of another embodiment of my invention.

My invention as herein disclosed is embodied in a screen which is usually rectangular, and which may be used in openings for windows, doors, transoms, skylights, or other such openings. The illustrations herein shown disclose a fragmentary portion of a screen suited for use in a rectangular window, the structure of a complete screen and its suspension means being obvious from an examination of the portions illustrated.

Referring now to the drawings, a screen panel 10 is suspended in a strong and sturdy frame 11. The screen panel may be manufactured from suitably heavy wire mesh having openings small enough to exclude insects. The wire may be of strong material such as stainless steel or other metal or alloy of sufficient strength and ductility. In any event, the wire should be strong enough so that it cannot be broken by ordinary tools which might come into the possession of a patient, or cannot be seriously injured by impact by heavy objects such as chairs.

The frame 11 may be permanently or removably fixed to a window frame, or to a corresponding element in any opening other than a window. For the purpose of this disclosure the frame 11 may be considered as fixed in position, although it will be apparent that it may be hinged or otherwise arranged to be conveniently movable or removable.

In the embodiment here shown, the frame 11 is built up from a channeled body 12, a bottom cover plate 13 and a top cover plate 14. The body 12 has a base 15 and two side flanges 16 and 17. Cover plate 13 may be permanently fixed to flange 16 by welding or otherwise. Cover plate 14 is removably attached to flange 17, such as by screws 18, to permit convenient assembly of the suspension elements later to be described. It will be obvious that in the construction disclosed the removable plate 14 will be on that side of the frame which is inaccessible to the patients, or to the prospective intruder if the screen is being used as a burglar proof shield.

Cover plates 13 and 14 extend inwardly beyond the flanges of channel 12, and are then bent towards each other at 19, and finally bent reversely at 20, the described construction providing a peripherally extending chamber 21 which houses the resilient screen suspension.

I have provided novel and improved resilient suspension means for attaching the screen panel 10 to the frame 11. The peripheral edge of the screen panel 10 extends inwardly through the slot 22 in the frame (Fig. 2). Distributed at suitable intervals around frame 11, and within chamber 21, are a plurality of spaced elements 25, here shown as semi-cylindrical bars attached to frame 11 by any suitable adjustable means. As here shown each bar is suspended from the base 15 of the channel 12 by means of a capped screw 26, the shank of which passes, with clearance, through an aperture in base 15 and has a threaded engagement with bar 25. A plural turn spring wire helix 28 is threaded through panel 10 and is carried by bar 25 in the manner shown in the drawings. The turns of the helix are close enough to each other so that they preferably pass through adjoining or nearby apertures in the screen, and in one embodiment adjoining turns pass through alternate screen openings as best seen in Fig. 4. The edge of the screen may be rolled around a rod or strip to provide a reinforcing bead, but as here shown the edge is merely folded upon itself once or twice, as designated by reference numeral 30, since this has been found to afford a quite adequate backing for the turns of the helix.

The hemispherical shape of the bar 25 results in several advantages. The outturned convex surface may be predetermined to closely conform to the curvature of the wire helix. The inward half 28a of the helix (Fig. 3) is then free to flex when a strain is applied to the screen.

In Fig. 6 there is shown a supporting bar 31 of a sectional contour such that its radius of curvature is less than that of the spring helix, thus affording a greater leeway for flexure of each helix turn, if necessary or desirable.

The installation and operation of the screen structure is now obvious from the drawings, and the description already given. A plurality of spaced spring wire helices are threaded in a series along each edge of the screen panel. The upper cover plate 14 being removed, the panel is laid on frame 11. A bar 25 is inserted within each helix and the shank of an attaching cap screw is inserted through base 15 of channel 12, and is threaded into the bar 25. The plurality of cap screws around the frame are then turned up to suitably space the panel with respect to the frame, and to apply proper tension to the panel. The tip end of the screw shank passes between turns of the helix.

Fig. 7 illustrates an embodiment of the invention in which each bar 25 is attached to the frame 11 by two spaced, adjustable capped screws.

The type of suspension herein illustrated and described is adequately resilient, and applied shocks are transmitted to each screw 26 at a plurality of points, each represented by a turn of the helix. The effect is also further localized by the interruptions between the several spring helices, so as to permit proportional yielding according to the distance from the point of application of shock, and thereby to prevent injury to the screen panel.

It will be obvious from a consideration of the structure hereinabove described, and disclosed in the drawings, that the screen mounting elements can be fabricated very cheaply as compared with resilient mountings of the type heretofore known and used. Assembly of the spring suspension can be performed easily and rapidly. Tests of this new suspension have demonstrated that it will withstand shocks of great severity without rupture or damage to the screen panel.

While the panel suspension described herein has been characterized as particularly suited to use with detention screens, the screen mounting I have invented may be used for flexible panels of other types than those made of screen wire, for example canvas, textiles, or transparent or translucent sheets of varied character.

What I claim is:

1. Screen supporting means of the character described, comprising a rigid frame, a screen panel disposed within said frame, and yieldable panel suspension means for retaining said screen in said frame, said supporting means including a plurality of holding devices attached to said frame in the plane of said panel and adjustable towards or from the panel center, and distributed at intervals along each side of said frame, and adjacent the peripheral edge of said panel, and helical wire spring means having each turn thereof threaded through said panel with the helical axis extending longitudinally along said peripheral edge, and each said turn likewise extending around the holding device adjacent thereto.

2. Screen supporting means of the character described, comprising a rigid frame, a screen panel disposed within said frame, and yieldable panel suspension means for retaining said screen in said frame, said supporting means including a plurality of holding devices attached to said frame in the plane of said panel and adjustable towards or from the panel center, and distributed at intervals along each side of said frame, and adjacent the peripheral edge of said panel, and helical wire spring means having each turn thereof threaded through said panel with the helical axis extending longitudinally along said peripheral edge, and each said turn likewise extending around the holding device adjacent thereto, each said holding device consisting of a relatively short bar lying parallel to said frame in the plane of said panel.

3. Detention screen supporting means of the character described comprising a rigid frame, a screen panel disposed within said frame, and yieldable panel suspension means for retaining said screen in said frame, said supporting means including a plurality of holding devices attached to said frame in the plane of said panel and adjustable towards or from the panel center, and distributed at intervals along each side of said frame, and adjacent the peripheral edge of said panel, and helical wire spring means having each turn thereof threaded through said panel with the helical axis extending longitudinally along said peripheral edge, and each said turn likewise extending around the holding device adjacent thereto, each said holding device consisting of a relatively short bar lying parallel to said frame in the plane of said panel, said bar being of semi-cylindrical contour and having the curved spring-supporting portion of its surface outturned towards said frame.

4. Detention screen supporting means of the character described comprising a rigid frame, a screen panel disposed within said frame, and yieldable panel suspension means for retaining

said screen in said frame, said supporting means including a plurality of holding devices adjustably attached to said frame, and distributed at intervals along each side of said frame, and adjacent the peripheral edge of said panel, and helical wire spring means having each turn thereof threaded through said panel and longitudinally along said peripheral edge, and each said turn likewise extending around the holding device adjacent thereto, each said holding device consisting of a relatively short bar lying parallel to said frame in the plane of said panel, said bar being of semi-cylindrical contour and having the curved spring-supporting portion of its surface outturned towards said frame, the radius of curvature of said curved portion approximating the radius of curvature of said helical spring.

5. Detention screen supporting means of the character described comprising a rigid frame, a screen panel disposed within said frame, and yieldable panel suspension means for retaining said screen in said frame, said supporting means including a plurality of holding devices adjustably attached to said frame, and distributed at intervals along each side of said frame, and adjacent the peripheral edge of said panel, and helical wire spring means having each turn thereof threaded through said panel and longitudinally along said peripheral edge, and each said turn likewise extending around the holding device adjacent thereto, each said holding device consisting of a relatively short bar lying parallel to said frame in the plane of said panel, said bar being of semi-cylindrical contour and having the curved spring-supporting portion of its surface outturned towards said frame, the radius of curvature of said curved portion being less than the radius of curvature of said spring.

6. A screen of the character described comprising a rigid frame having opposed spaced cover plates and a connecting cross wall attached to said plates and transversely bridging the space therebetween, so as to form an inner peripherally extending chamber, said plates along their inner edges being spaced apart to form an inwardly facing slot opening into said chamber, a screen panel mounted in the opening of said frame with its peripheral edge lying within said chamber, yieldable mounting means for said panel comprising a plurality of holding devices adjustably attached to said cross wall and distributed at intervals around said frame and within said chamber adjacent said peripheral edge of said panel, and

a plurality of helical wire springs each having the turns thereof extending around a single holding device, and each said turn being threaded through said screen panel adjacent said peripheral edge.

7. A screen of the character described comprising a rigid frame having opposed spaced cover plates and a connecting cross wall attached to said plates and transversely bridging the space therebetween, so as to form an inner peripherally extending chamber, said plates along their inner edges being spaced apart to form an inwardly facing slot opening into said chamber, a screen panel mounted in the opening of said frame with its peripheral edge lying within said chamber, yieldable mounting means for said panel comprising a plurality of holding devices adjustably attached to said cross wall and distributed at intervals around said frame and within said chamber adjacent said peripheral edge of said panel, and a plurality of helical wire springs each having the turns thereof extending around a respective holding device, and each said turn being threaded through said screen panel adjacent said peripheral edge, each said holding device consisting of a relatively short bar of semi-cylindrical contour, and having the curved portion of its surface outturned towards said frame, the radius of curvature of said curved portion being substantially identical with the radius of curvature of said spring.

MAX SEIDE.

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