Feb. 24, 1931. J. V. ABRONSKI 1,793,535

WINDOW SCREEN

Filed Oct. 10, 1927 3 Sheets-Sheet 1

FIG. 1.

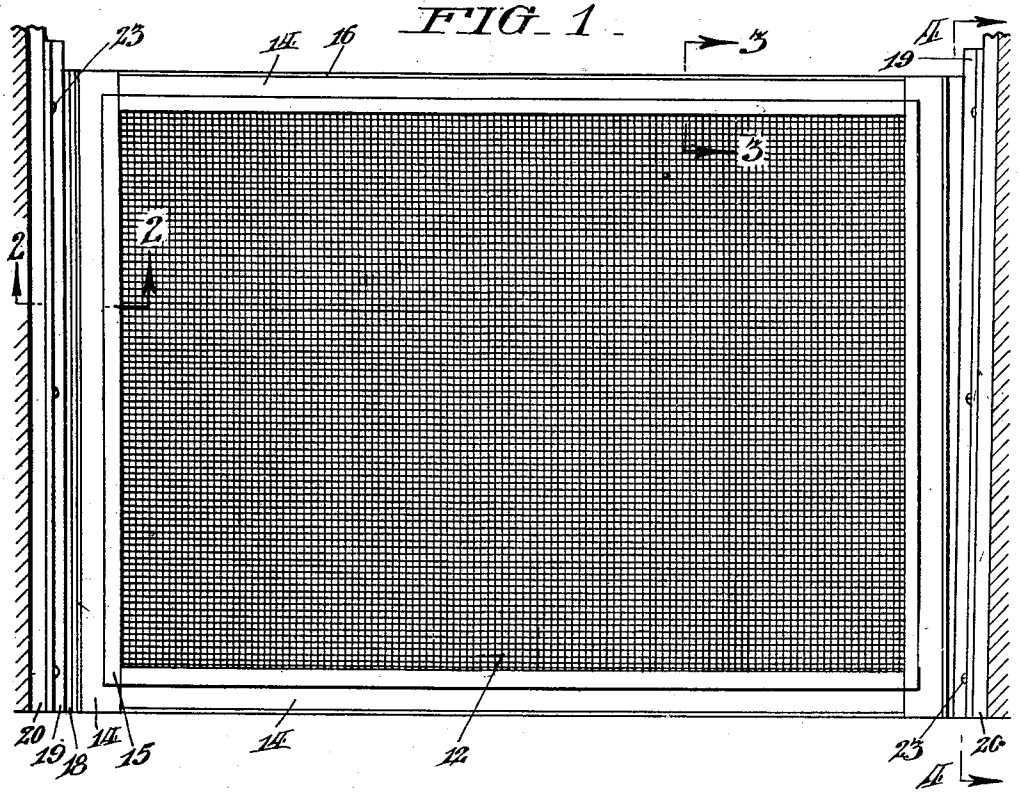


FIG. 2.

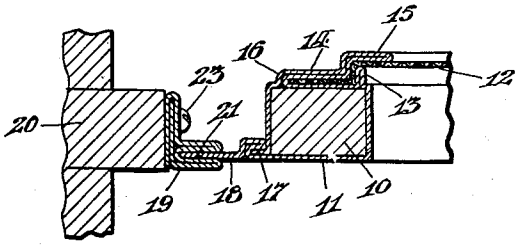
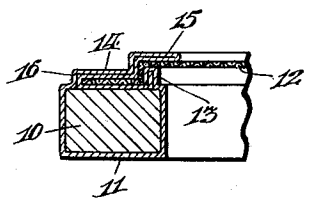


FIG. 3.



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WINDOW SCREEN

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FIG. 5.

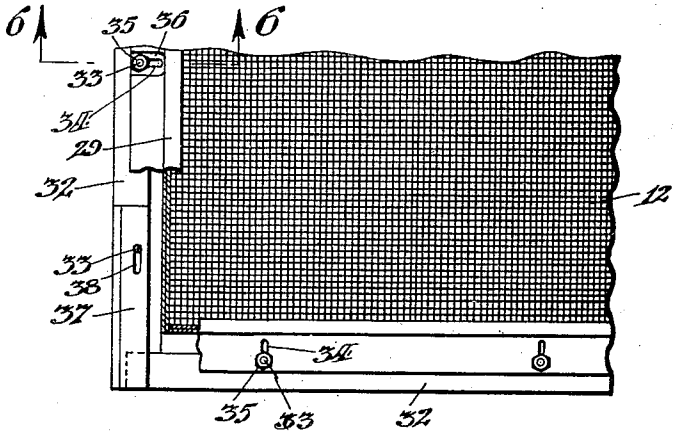


FIG. 4.

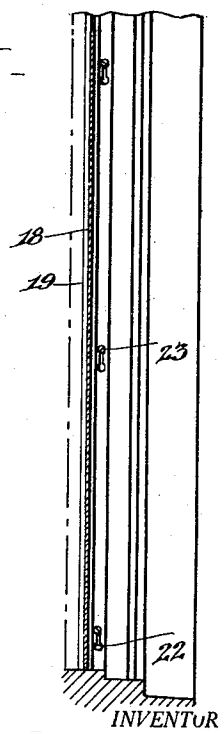
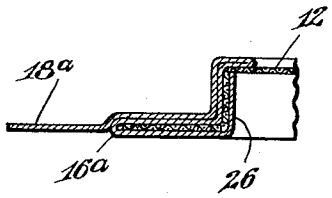


FIG. 9.



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WINDOW SCREEN

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FIG. 6.

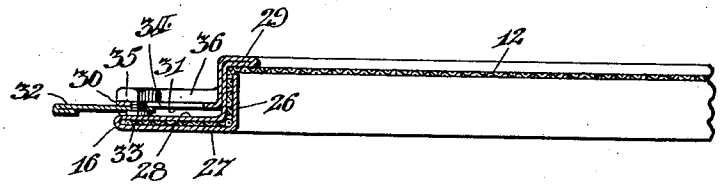


FIG. 7.

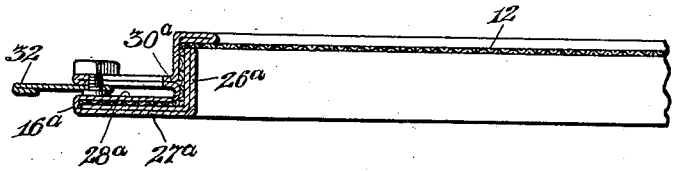
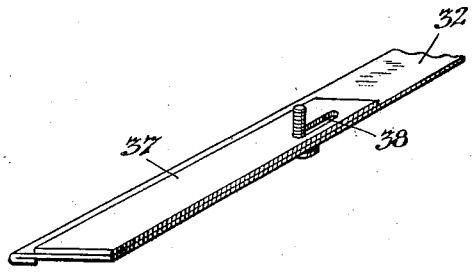


FIG. 8.



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Patented Feb. 24, 1931 1,793,535

UNITED STATES PATENT OFFICE

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WINDOW SCREEN

Application filed October 10, 1927. Serial No. 225,100.

This invention relates to adjustable partitions for covering or screening openings, and particularly to partitions or screens adapted to span openings whose sides are not in parallelism.

An object of the invention is to provide a screen or partition frame, adapted to be made in accordance with a standard design or pattern, which includes adjustable means enabling the frame to be fitted to openings which could not be satisfactorily covered by a screen or partition having an ordinary frame.

Another object of the invention is to provide a screen frame, preferably made of metal or other material adapted to be similarly fashioned, which may be made in accordance with a standard design or pattern and whose frame members may be formed to provide stretching and clamping means for the screen cloth and a guideway adapted to receive an adjustable compensating piece so that the frame may be fitted to openings which an ordinary screen could not satisfactorily cover.

Another object of the invention is to provide a screen, adapted to be fitted to an opening which is out of square, including guides in which the screen is adapted to slide and which may be quickly and easily removed so as to leave the opening clear during the periods when the screen is not required.

Still another object of the invention is to provide a metal covered frame having means for automatically clamping and stretching the screen cloth during the assembling of the metal covered frame.

A feature of the invention resides in the formation of a guideway within a frame member wherein an adjustable compensating piece is fitted and adapted to be fixed in position when brought into abutment with a bordering surface.

Another feature comprises the use of material which may be fashioned into innumerable forms of frame members which have stretching and clamping means for the screen cloth and means for carrying an adjustable compensating piece.

The invention comprises frame members for a window screen which include sheet metal material so bent on itself as to provide a ledge and an overlapping member bendable into position relative to said ledge in order to clamp screen material to the frame members and, incidentally, to stretch the same while being so clamped.

The invention also contemplates adjusting means whereby the frame may be fitted into window openings having non-parallel sides or otherwise deformed from the true and regulation shapes of such openings, and to this end compensating members are provided on the edges of the side frame members adapted to be received in suitable members secured to the window frame.

In the drawings

Figure 1 shows a screen embodying my invention mounted in a fragment of a window frame.

Figure 2 a cross-sectional view taken on line 2—2 on Figure 1, and

Figure 3 a cross-sectional view taken on line 3—3 on Figure 1.

Figure 4 is a fragmentary view of the inside of a window frame, as indicated by line 4—4 on Figure 1, showing the lower part of a screen runway mounted thereon.

Figure 5 is a front view of a fragment of a screen showing my invention in another form.

Figure 6 a cross-sectional view taken on line 6—6 on Figure 5, and

Figure 7 a view similar to Figure 6 but showing a different form of construction.

Figure 8 is a perspective view of a fragment of a compensating member forming a part of my invention, and

Figure 9 a view similar to Figure 6 but showing a different method of forming the frame member.

In Figures 1, 2 and 3, I have shown a screen frame composed of frame members 10 which may be comprised of a body part of wood or other suitable material, covered with metal sheathing 11 so formed as to automatically stretch screen cloth 12 when it is drawn over a ledge 13 and clamped under a clamping part 14 which may include a lip 15, if desired. Figure 3 shows one method of

forming the sheath in which the metal is bent at right angles to form the inner part of ledge 13 and then folded back upon itself at 16 to form the under part of clamping part 14. This part may be folded back upon itself or may be bent into Z-shape to form lip 15, as shown, and then bent from the edge of the Z to form a double-thick Z-shaped clamping part.

Considering the side of the frame carrying the screen cloth as the face, the metal is then carried around the outside of the frame member, across the back and over the inside of the frame member, and then bent into hook-shape over the right angle bend first made so as to complete ledge 13. In forming the frame, bend 16 is made so that clamping part 14 stands at about 45° to the face of the frame, screen cloth 12 cut to size and placed in position with its edges overlapping ledges 13 on all four sides of the frame, and clamping part 14 pressed against the face of the frame. The extreme edges of screen cloth 12 will be caught first and clamping parts 14 will tend to hold them while bending the screen cloth over ledges 13, thus automatically pulling the screen cloth taut on the frame.

The screen may have all four of its frame members formed as shown in Figure 3 or it may have the side members provided with extensions adapted to be slidably mounted in runways, as shown in Figure 2, so that the screen may be slidably mounted in a window frame. Frame members 10 may be covered with metal sheathing 11 in a number of different ways but has been shown in Figure 2 as having sheathing 11 bent at right angles to form a flange 17 aligning with the back of frame member 10. The sheathing is bent at 16 at substantially 45° to the face of the screen and then bent into a Z-shaped form to produce clamping part 14 having a lip 15 adapted to overlap ledge 13 and the screen cloth when it has been pressed into place.

After the double-thick Z-shaped clamping part has been formed, the sheating is bent inwardly at 16 to cover the face of frame member 10 and a fold formed adjacent the inner edge of frame member 10 and extending parallel thereto which forms ledge 13, after which the sheathing is carried down the inside edge of the frame member, across its back and crimped over flange 17 so that the sheathing surrounding frame member 10 is securely held in place. The sheathing is then carried outwardly in the plane of the back of the screen frame so as to form a compensating piece 18 which may be slidably mounted in a runway 19 shown mounted on the bead 20 of the window frame (see Figures 2 and 4). After the entire screen frame is formed, screen cloth 12 is placed thereon, with its edges overlapping ledges 13, and clamping part 14 pressed into place with the above described results.

It is found that the windows in the same building will vary slightly in size and that there is a considerable discrepancy in the sizes of windows in different buildings which are supposed to have the same size of frames. This results in the necessity of building frames especially for each window or to use a screen having a spring-pressed adjustment which has never proved to be satisfactory. Another difficulty that is encountered in installing screens in windows arises from the fact that nearly all buildings settle and thus cause the window frames to become out of square. So far, no provision has been made for providing screens for such windows with the exception of making screens especially for each individual window.

With the use of my improved screen having the compensating pieces 18, shown in Figure 2, these difficulties are entirely overcome and my improved screen may be readily installed in windows varying slightly in size and in windows whose frames are out of square, as shown at the right hand side of Figure 1 in which an exaggerated condition is shown for illustrative purposes only as, in the prevalent condition, the sides of the window remain parallel but are out of square with the sill. My improved screen is furnished with compensating pieces 18 extending from either side which are considerably wider than necessary. In installing the screen, measurements of the window are taken and compensating pieces 18 cut so that the bottom frame member may rest evenly upon the window sill when the edges of the compensating pieces are parallel with the window sides. It is also to be understood that the bottom or top frame member may be furnished with compensating pieces, if desired.

After compensating pieces 18 have been cut so that the screen fits the window opening, a runway 19 is mounted upon each side of the window frame and the screen slidably mounted in them with the back of the upper frame member preferably abutting the bottom stile of the upper sash, thus producing a screen that completely fills the opening, may be raised or lowered by sliding it in runways 18, and may be quickly removed from the window when desired.

Each guide 19 is preferably folded from a single strip of material, as shown in Figure 2, so as to form a channel 21 in which compensating piece 18 may slide. The flange of runway 19 is secured to the window frame by suitable means, as screws 23, and preferably provided with a plurality of keyhole openings 22 through which screws 23 may be inserted for securing the runway to the window frame; the spacing of the screws being the same as the spacing between openings 22 so that it is merely necessary to loosen the screws

and raise runway 19, until the large part of each opening aligns with the head of the screw, to remove the runway from the window frame, thus providing a clear opening when the screen is not needed and obviating the necessity of exposing the runways to the elements during cold weather.

In Figures 5 and 6, I have shown a different method of adjusting a screen to openings which are irregular or which vary slightly in size. In these views, I have shown the frame composed entirely of sheet metal but it will be understood that adjustable compensating pieces may as readily be applied to the metal covered frame shown in Figure 1. In the form of frame construction shown, the body part of the frame is angular in cross-section to provide a ledge 26 and a back 27 above which is disposed a Z-shaped clamping part 28 terminating in a double-thick lip 29 which overlaps ledge 26 and screen cloth 12. The outer thickness of the metal is then bent parallel to the plane of the frame to form a guide 30 slightly spaced from clamping part 28 to form a guideway 31.

A compensating piece 32 is slidably mounted in a guideway 31 and provided with a plurality of bolts 33 which extend through slots 34 formed in guide 30 in order to allow compensating piece 32 to be adjusted transversely while held against longitudinal movement. As the strain on bolts 33 is very slight, they are provided with very thin nuts 35 which may abut the outer surface of guide 30, as shown in Figure 7, or be disposed in recesses 36, as shown in Figures 5 and 6.

A screen made in this manner may be provided with compensating pieces on each side only, in which case the ends of the compensating pieces will be flush with the bottom of the screen frame, or it may be provided with compensating pieces on the top or bottom, as shown in Figure 5. In this case, the bottom compensating piece is made to overlap the side compensating pieces and an auxiliary compensating piece 37 mounted on the lower end of each side compensating piece 32 by having a slot 38 through which the lowermost bolt 33 extends so that auxiliary piece 37 may be raised or lowered to allow for the distance that the bottom compensating piece extends beyond its guideway.

The construction shown in Figure 7 is very similar to that shown in Figure 6 with the exception that the body part of the frame is provided with double-thick ledge 26ª, a double-thick back 27ª and a double-thick guide 30ª. Figure 9 shows a form of construction very similar to that shown in Figure 6 with the exception that the piece forming guide 30 is extended beyond the body part to form a compensating piece 18ª which functions in exactly the same manner as compensating piece 18 shown in Figure 2.

In forming the frame members, the body part is bent at 16ª so that the clamping part extends at approximately 45° to the plane of the screen; screen cloth 12 is then placed in position and the clamping parts pressed against the body parts. As they swing into place, they will first seize the extreme edge of the screen cloth and tend to hold same against movement so that, as clamping part 28 bends the screen cloth over the ledge 26, the screen cloth will be stretched taut in the frame.

From the foregoing, it is apparent that a great variety of screen frames may be produced which will embody the essential features of my invention; the forms illustrated are merely representative of the possibilities of combining a fixed frame member with a fixed or adjustable compensating piece to enable the screen to be exactly fitted to an opening whose sides are not parallel or whose ends are not at right angles to its sides. The sheathing and, when formed of metal, the frames may be shaped by rolls, presses, by extrusion or in any other manner known to the metal trades.

It will be understood that variations in the details of the construction as hereinbefore set forth may be resorted to within the scope of the invention herein outlined and hereinafter claimed.

I claim:

1. As an article of manufacture a frame for holding a screen in a window opening and means associated with said frame for adjustably attaching the screen thereto, and having a portion thereof on one side of the frame rebent upon itself to provide a ledge and another portion bendable over said side of the frame to a point adjacent said ledge whereby the screen may be adjustably attached to said frame.

2. As an article of manufacture a frame for holding a screen in a window opening and means associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge.

3. As an article of manufacture a frame for holding a screen in a window opening and means associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge and over the same.

4. As an article of manufacture a frame for holding a screen in a window opening and means associated with said frame for adjustably attaching the screen thereto and being rebent upon itself to form a ledge, a second portion being rebent upon itself and being of a width to extend across the side of the frame

and to be bent upward in parallelism with the ledge and over the same.

5. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto, and having a portion thereof on one side of the frame rebent upon itself to provide a ledge and another portion bendable over said side of the frame to a point adjacent said ledge whereby the screen may be adjustably attached to said frame.

6. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion extending from said envelope adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge.

7. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion extending from said envelope adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge and over the same.

8. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto and being rebent upon itself to form a ledge, a second portion being rebent upon itself and being of a width to extend across the side of the frame and to be bent upwardly in parallelism with the ledge and over the same.

9. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto and having a portion thereof on one side of the frame rebent upon itself to provide a ledge and another portion bendable over said side of the frame to a point adjacent said ledge whereby the screen may be adjustably attached to said frame, and a compensating flange integral with the envelope.

10. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion extending from said envelope adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge, and a compensating flange integral with the envelope.

11. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion extending from said envelope adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge and over the same, and a compensating flange integral with the envelope.

12. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto and being rebent upon itself to form a ledge, a second portion being rebent upon itself and being of a width to extend across the side of the frame and to be bent upwardly in parallelism with the ledge and over the same, and a compensating flange integral with the envelope.

13. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto and having a portion thereof on one side of the frame rebent upon itself to provide a ledge and another portion bendable over said side of the frame to a point adjacent said ledge whereby the screen may be adjustably attached to said frame, and a compensating single thickness flange integral with the envelope.

14. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion extending from said envelope adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge, and a compensating single thickness flange integral with the envelope.

15. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion extending from said envelope adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge and over the same, and a compensating single thickness flange integral with the envelope.

16. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto and having a ledge formed therein, a flexible portion extending from said envelope adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge and over the same, and a compensating flange integral with the envelope.

12. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto and being rebent upon itself to form a ledge, a second portion being rebent upon itself and being of a width to extend across the side of the frame and to be bent upwardly in parallelism with the ledge and over the same, and a compensating flange integral with the envelope.

13. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto and having a portion thereof on one side of the frame rebent upon itself to provide a ledge and another portion bendable over said side of the frame to a point adjacent said ledge whereby the screen may be adjustably attached to said frame, and a compensating single thickness flange integral with the envelope.

14. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion extending from said envelope adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge, and a compensating single thickness flange integral with the envelope.

15. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto, and having a ledge formed therein, a flexible portion extending from said envelope adapted to be bent into substantial parallelism with the frame to a point adjacent the ledge and to be then bent upwardly in parallelism with the ledge and over the same, and a compensating single thickness flange integral with the envelope.

16. As an article of manufacture a frame for holding a screen in a window opening and a sheet metal envelope associated with said frame for adjustably attaching the screen thereto and being rebent upon itself to form a ledge, a second portion being rebent upon itself and being of a width to extend across

the side of the frame and to be bent upwardly in parallelism with the ledge and over the same, and a compensating single thickness flange integral with the envelope.

17. A screen member comprising a bar, a unitary envelope of sheet material one edge of said sheet being infolded, the other edge extending laterally as a compensating flange.

18. A screen member comprising a bar, a unitary envelope of sheet material one edge of said sheet being infolded, the other edge extending laterally as a compensating flange with other folds having screen tensioning and retaining functions.

19. A screen member comprising a bar, a unitary sheet enveloping the bar, said envelope comprising a ledge and a folded part from the opposite side of the bar engaging said ledge along the side and bent over the top.

20. A screen member comprising a bar, a unitary sheet enveloping the bar, said envelope comprising a ledge having a folded screen supporting edge, and a folded part from the opposite side of the bar engaging said ledge along the side and bent over the top with a folded edge in fabric clamping position.

21. A screen member comprising a bar, a unitary sheet having a fold at one side of the bar and extending therefrom laterally as a flange and also wholly enveloping the bar with the final edge interfolded in said fold.

22. A screen member comprising a bar, a unitary sheet having a fold at one side of the bar and extending therefrom laterally as a flange and also wholly enveloping the bar with the final edge interfolded in said fold, and other folds including a fabric supporting ledge.

23. A screen member comprising a bar, a unitary sheet having a fold at one side of the bar and extending therefrom laterally as a flange and also wholly enveloping the bar with the final edge interfolded in said fold, other folds including a fabric supporting ledge, and a part clamping along side the ledge.

24. A screen member comprising a bar, a unitary sheet having a fold at one side of the bar and extending therefrom laterally as a flange and also wholly enveloping the bar with the final edge interfolded in said fold, other folds including a fabric supporting ledge, and a part clamping along side the ledge and over the top.

25. A screen member comprising a bar, a unitary sheet having a fold at one side of the bar and extending therefrom laterally as a flange and also wholly enveloping the bar with the final edge interfolded in said fold, other folds including a fabric supporting ledge, and a part clamping along side the ledge and over the top in fabric clamping relation.

26. A screen member comprising a bar, a unitary sheet having a fold at one longitudinal corner of the bar and extending therefrom laterally as a single thickness flange and also wholly enveloping the bar with the final edge interfolded in said fold, and a channeled slideway for said flange.

27. A screen member comprising a bar, a unitary sheet having a fold at one longitudinal corner of the bar and extending therefrom laterally as a single thickness flange and also wholly enveloping the bar with the final edge interfolded in said fold and other folds including a fabric supporting ledge, a part clamping along side the ledge and over the top in fabric clamping relation, and a channeled slideway for said flange.

In testimony whereof I have signed my name to this specification.

JOHN V. ABRONSKI.