Nov. 13, 1962 P. E. FREEMAN 3,063,520

SCREEN TYPE STRUCTURES

Filed March 12, 1959

Fig. 1

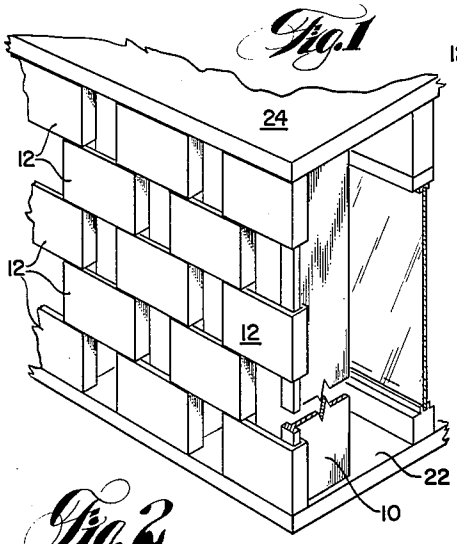


Fig. 2

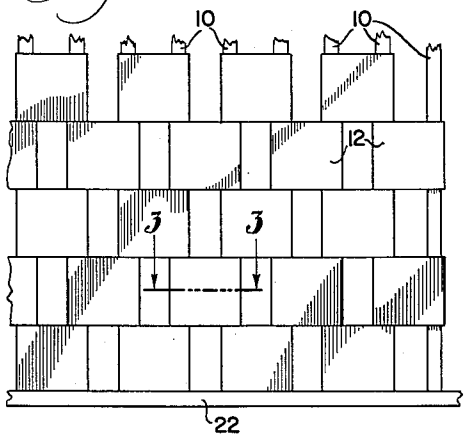


Fig. 3

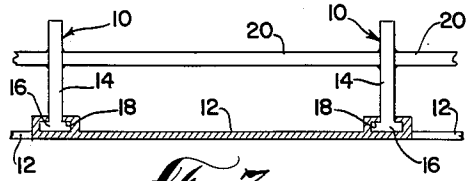


Fig. 4

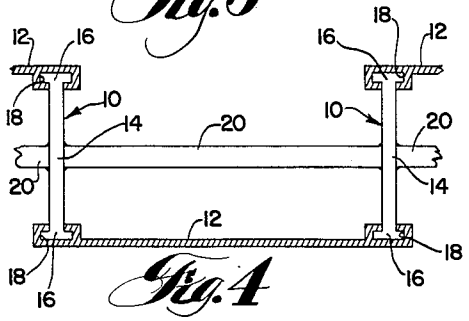


Fig. 5

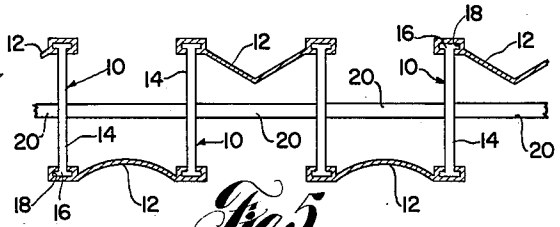


Fig. 6

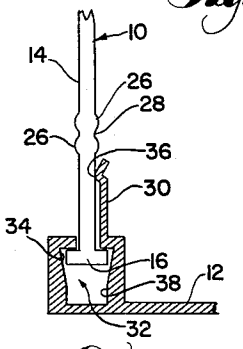


Fig. 7

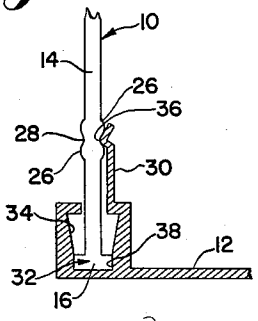


Fig. 8

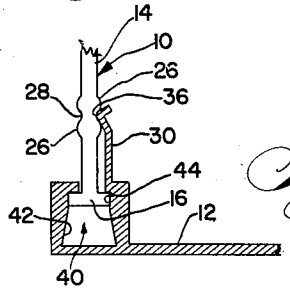


Fig. 9

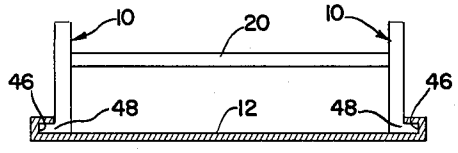
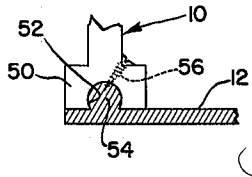


Fig. 10



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SCREEN TYPE STRUCTURES

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5 Claims. (Cl. 189—34)

This invention relates to a building structure, and more particularly pertains to screen type structures for architectural use.

It is the principal object of this invention to provide a structure of the above type which will act as a shading mask against the sun rays and an as concealing overlay on other materials.

A further object of the invention is to provide a structure of the above character made from a plurality of interlocking units which may be readily assembled to yield a shading and decorative screen of any desired dimension.

Another object of the invention is to provide screen structures of the above type which may be assembled to achieve a wide variety of functional and ornamental patterns.

A still further object is to provide screen type structures of generally modular construction which lend themselves to complete fabrication from regularly employed building materials, particularly light metals such as aluminum.

These together with other objects and advantages of the invention will best be understood by referring to the following detailed specification of preferred embodiments thereof, and to the accompanying drawings, in which:

FIG. 1 is a fragmentary perspective view of a typical panel assembly illustrating one embodiment of the invention installed as a shading and vision screen exterior to a building wall;

FIG. 2 is a front elevational view of a typical screen structure falling within the scope of the invention;

FIG. 3 is a partial sectional plan view taken on the line III—III of FIG. 2;

FIG. 4 is a view similar to FIG. 3 modified to illustrate I-beams for a front-back arrangement of panels with reference to their supporting rails or beams;

FIG. 5 is a view similar to FIG. 4 modified to illustrate substitute modular panel members;

FIG. 6 is a partial sectional fragmentary view of a modified detent and groove means for securing panels of the invention to their supporting rails prior to final assembly;

FIG. 7 is a view similar to FIG. 6 in final detent-groove engaging assembly;

FIG. 8 is a view similar to FIG. 7 incorporating a reversed arrangement of the detent-groove locking assembly;

FIG. 9 is a partial sectional view of a modified form of screen assembly falling within the scope of the invention; and

FIG. 10 is a partial sectional fragmentary view of a further modification of the screen assembly of the invention.

In general, the improved screen structures of the present invention preferably employ parallel spaced supporting rails or members and a plurality of panels extending between adjacent pairs of the supporting members. The screen structures may also provide for a series of panels arranged in adjacently spaced planes, the panels being in staggered and marginal overlapping relation to each other in the two planes.

Referring to the drawings wherein like reference numerals designate similar parts throughout the various views, elongated supporting beams or rails **10** together with panel members **12** slidably engaged between adjacent pairs of the rails generally constitute the screen structures of the invention. The rails are preferably disposed in spaced parallel relationship, and may be arranged not only in a single plane, but also may define angular or arcuate panel supporting structures.

A rail **10** substantially in the form of a T-beam is particularly suitable, especially in a screen structure employing a series of laterally spaced panels **12** arranged substantially in a single plane in marginal overlapping relationship. The rails consist essentially of a web portion **14** and transverse terminal flange **16** preferably coextensive with the length of the web and serving as supporting surfaces for the panels **12** in a manner to be described hereinafter in more detail.

Each panel **12** is provided with two spaced parallel mounting grooves **18** (FIG. 3) substantially in the form of T-slots capable of sliding assembly of a panel over the flanges **16** of adjacent pairs of the supporting rails **10**. The mounting grooves **18** are preferably disposed on the same surface of each panel **12** and in a screen structure comprising three or more supporting rails **10** (FIGS. 1 and 2), the panels **12** are preferably arranged in parallel rows with the panels in each row being spaced apart and alternating with the panels in an adjacent row.

It will be observed that once the panels **12** have been assembled, as illustrated in FIGS. 1, 2 and 3, an essentially self-sustaining structure is provided and no panel can be disengaged from its interengaging supporting rail flanges **16** by lateral movement of a panel outwardly away from the rail **10**. The panels **12** can be further secured on their supporting rails **10** by tack-welding, peening, or other well-known securing techniques, if required, and the rails **10** may be structurally-laced at selected points by suitable cross-bracing members **20** (FIG. 3). Also, on reference to FIGS. 1 and 2, it will be observed that the lowermost row of panels rest on a footer, such as an extended floor or patio surface **22**, and are structurally engaged by a projecting porch roof **24**, or the like, along the upper row of panels **12** to provide structural stability to the screen structures thus far described.

The screen structures of the invention also lend themselves to front-back arrangement of the individual modular panels **12** in respect of their supporting rails **10**, as illustrated in FIGS. 4 and 5. Therein the supporting rails **10** are selected in the form of I-beams and the panels **12** slidingly assembled on the front and rear flanges **16** thereof. This arrangement of the panels **12** preferably presents the same motif as that shown in FIGS. 1 and 2, except that the parallel rows of spaced panels are staggered in two parallel planes (front-back) instead of a single plane.

There is illustrated in FIGS. 6 and 7 an alternate panel-to rail securing means to the tack-welding, peening or mechanical equivalent panel-securing means heretofore described (FIGS. 3, 4 and 5). At least one face of the web **14** of the panel supporting rails **10**, whether they may be of generally T or I cross section, is preferably provided with a pair of protruding ribs **26** forming an elongated groove **28** therebetween to frictionally receive a projecting detent or lug **30** carried by the panels **12** adjacent their flange receiving grooves **32**. The detents **30** may be formed integral with at least one wall of the groove **32** and be contiguous therewith, or they may be separately attached lug-type devices in spaced localized arrangement along one or both walls of each of the panel grooves **32**. The grooves **32** and detent **30** are both preferably located on the rear face of the panels **12** in relation to the furthest removed outwardly facing surfaces of the panels in respect of their supporting rails **10**. Where desired, the detent **30** may be formed along both walls of the groove **32** as described above thereby providing locking engagement with both faces of the web **14**.

In those cases where the detent and the groove panel-securing means above described is employed (FIGS. 6 and 7), it will be observed that the T-slot panel grooves 32 are of greater depth than the T-slot grooves 18 illustrated to best advantage in FIGS. 3, 4 and 5. Furthermore, the interior oppositely disposed walls of the grooves 32 are inclined outwardly at 34, adjacent the open entrance thereto, to provide sliding clearance of the flanges 16 of rail members 10 (FIG. 6) within the grooves during initial sliding assembly of panels 12 on the rails 10. Final assembly is thereafter obtained by forcing a panel 12 toward its adjacent pair of supporting rails 10 to register the unsupported terminal end 36 of the detent 30 into groove 28 on the web surface 14, which action also wedges the flange 16 (FIGS. 6 and 7) between restricted interior wall portions 38 of a groove 32.

FIG. 8 illustrates a modified form of detent-groove attachment between a panel 12 and supporting rails 10. In this embodiment of the invention T-slot grooves 40 on the rear face of a panel 12 are reversed in respect of their interior oppositely disposed walls 42 and 44 to permit initial free sliding assembly of a panel in clearance relationship between the outwardly inclined oppositely disposed interior wall portions 42 furthest removed from the entrance to the T-slot groove 40, in which case the unsupported terminal end 36 of a detent 30 would be disposed inwardly towards the center of the web 14 of a rail member 10, and thereafter wedging the flanges 16 of a pair of adjacent rails 10 through relative outward movement of a panel 12 away from the supporting rails 10 to register the detent terminal end 36 within groove 28 and wedge the flanges 16 between the restricted oppositely disposed interior wall portions 44 of grooves 40.

FIG. 9 illustrates a simplified form of screen structure of the invention in which the supporting rails 10 are selected in the form of L-bars. Therein the panel 12 is provided with channel grooves 46 for sliding passage over the outwardly turned flanges 48 of the rail members 10 supporting the same. The panels may be secured in desired arrangement on the rails 10 by any of the previously described securing means, and cross-bracing 20 may also be employed, when required, between adjacent rail members.

A still further modification of the invention as illustrated in FIG. 10 shows the sliding engagement reversed in that the flange of the supporting rail is provided with an elongated groove capable of slidably receiving a protruding rib extending from the panel. The terminal flange 50 of the rails 10 is provided with elongated re-entrant groove 52. Near the opposite marginal edges of the panels 12 are rearwardly extending rib members 54 for slidably engaging said re-entrant groove 52. The panels can be secured in desired arrangement on their supporting rails 10 by means of a self-tapping screw, for example, indicated generally at 56.

The facing panels of the invention may have a wide variety of geometrical patterns and may be surface decorated and/or colored to provide functional or design characteristics in the structures as might be desired. For the same reasons, the profile of the panel may be plane, angular or arcuate. Thus, the invention permits the assemblage of an economical screen system to any particular dimension, and in an almost infinite variety of functional and ornamental patterns. The shading and/or vision screen structures of the invention may be used in a wide variety of applications. Principally among these, the screen structures or systems may be used as screen curtains on the exterior of building walls; vision screens and barriers or partitions in rooms, patios and gardens; and as concealing overlays on old facades, cooling towers, elevators penthouses, canopy soffits and lobby walls.

Having described the invention generally and in terms of specific embodiments thereof, I claim:

1. In an architectural screen structure comprising panels slidably positioned in staggered spaced relationship on supporting rails therefor, securing means for selectively positioning the panels on said rails comprising spaced parallel T-slot grooves on a face of each panel into each of which a projecting flange on each of at least two parallel spaced rails extends, said T-slot grooves providing sliding clearance relationship between a portion of their oppositely disposed interior walls and the width dimension of the flanges received therein on initial sliding assembly of a panel thereon, and said T-slot grooves further providing restricted oppositely disposed interior wall portions in frictional engagement with said flanges on relative movement between the rails and a panel in a direction normal to a sliding assembly of a panel on its rails, said stated relative movement also serving to actuate a panel-securing detent-groove interconnection between a panel and its supporting rails.

2. A screen type structure comprising parallel spaced supporting rails, said rails having a web portion with a continuous elongated groove on at least one face of said web portion, elongated flanges extending from said web portion, a plurality of panels extending between said supporting rails in staggered spaced edge-engaging relationship and having longitudinal flanges rearwardly extending along their opposite edges for slidably engaging the elongated flanges of said supporting rails, and detent means projecting rearwardly from said longitudinal flanges adapted to seat in locking engagement in said elongated grooves thereby securing said panels in selected spaced position along the supporting rails.

3. In an architectural shading and vision screen structure comprising panel supporting rails in equally spaced parallel erection, the panels being supported on said rails in parallel rows with the panels in each row being spaced apart and alternating with the panels in parallel rows of the same adjacent thereto, each panel extending across the width of a pair of adjacent supporting rails and providing opposite corner support on and engagement with panels in adjacent parallel rows thereof, the panels being provided with T-slot grooves in sliding clearance relationship on T-flanges carried by the supporting rails, and detent means carried by the panels for registered engagement within a groove in the supporting rails for restraining and securing the panels in contact with the supporting rails.

4. A screen type structure comprising a plurality of elongated parallel equally spaced panel supporting rail members, each rail member being identical in cross-section transverse to its axial length and comprising a web one edge of which terminates in a transverse flange, a series of panels slidably supported on the flanges of the rail members, each panel extending across the width of a pair of adjacent rail members and the panels disposed in parallel rows with the panels in each row being spaced apart and alternating with the panels in an adjacent parallel row of the same, the width of each panel being at least equal to the distance between the transverse flanges of the equally spaced supporting rails to provide interfering edge engagement of the panels in the parallel rows of the same, a detent means projecting rearwardly from each panel, and a groove in the web of each supporting rail in registry with said detent means, said detent means within said groove constituting securing attachment of the panels on said supporting rails.

5. In an architectural screen structure comprising individual panels erected in spaced arrangement on parallel supporting rail members, each panel having a pair of parallel generally T-shaped grooves for receiving reversely disposed T-shaped flanges on the rail members, the parallel grooves in each panel being defined by oppositely disposed interior parallel walls and walls coextensive therewith and diverging outwardly therefrom, the parallel walls of each groove being substantial equal in axial length and separated a distance substantially equal to

the thickness and width dimensions respectively of the T-head of the reversely disposed T-shaped flanges on the rail members, detent-receiving groove in each rail member remote from the T-head flange thereof, a detent finger carried by each panel adjacent its parallel grooves, said panels being freely slidable in assembly on adjacent pairs of the rail members with the T-heads of the T-shaped flanges each received between the diverging walls of the grooves in the panels, and said panels being securable in desired spaced position on the rail members by relative movement between panels and rail members normal to the direction of their slidable assembly to register the T-heads of the T-shaped flanges between the oppositely disposed parallel walls of the panel grooves with the detent fingers in registry within the grooves in the rail members.

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