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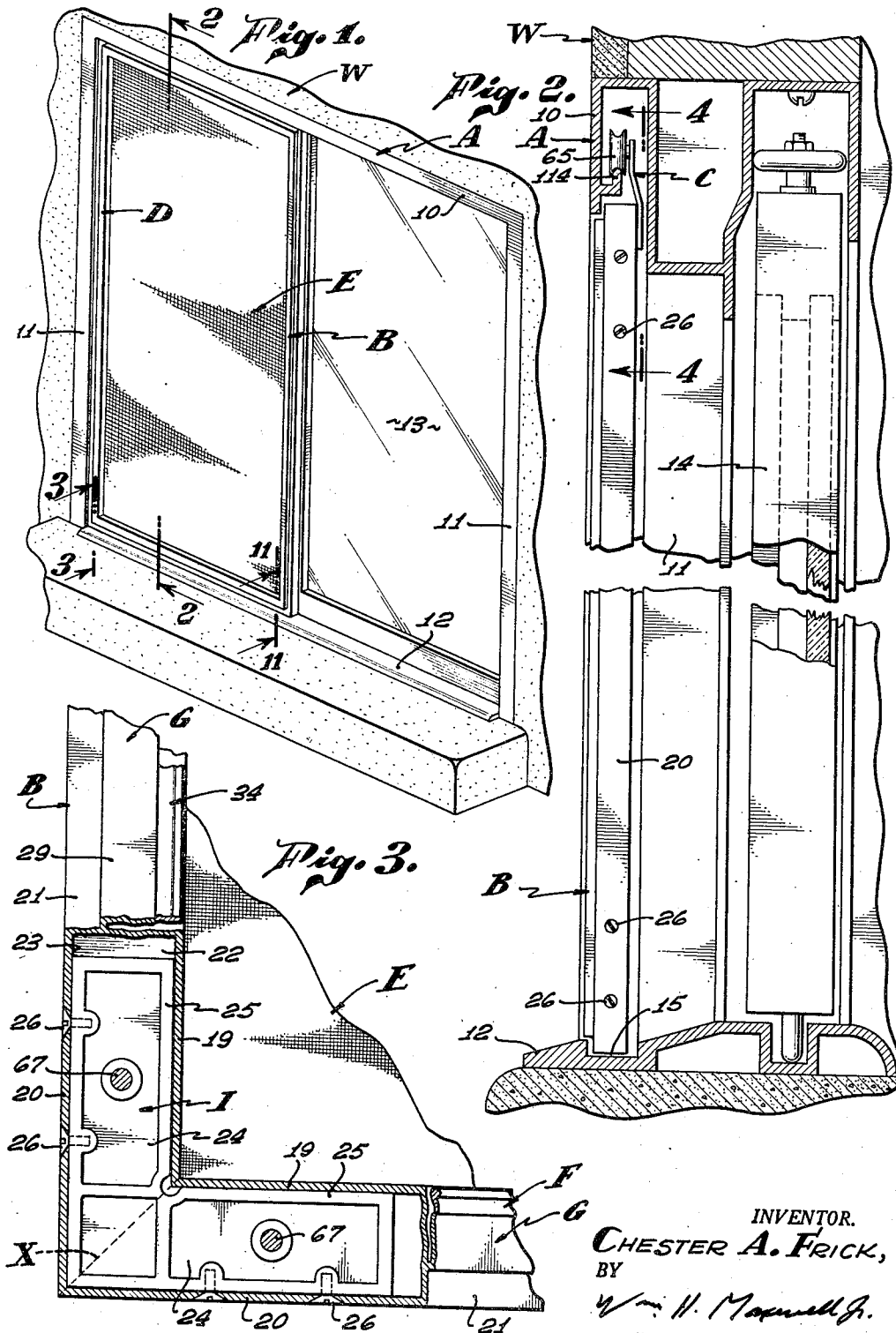
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2,808,880

SCREEN CONSTRUCTION FOR DOOR OPENING, OR THE LIKE

Filed Jan. 25, 1954

2 Sheets-Sheet 1



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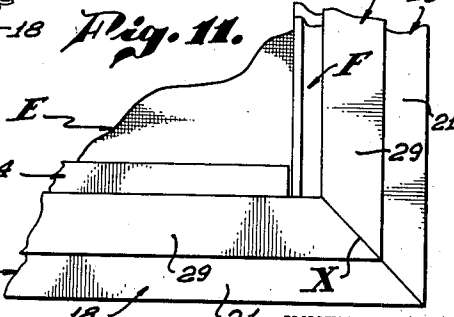
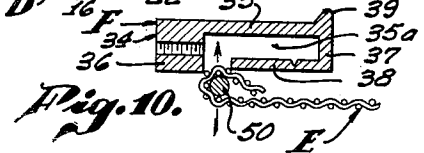
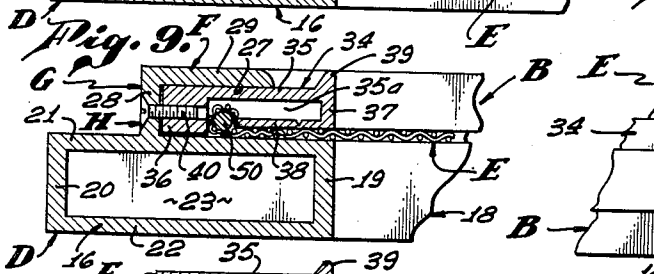
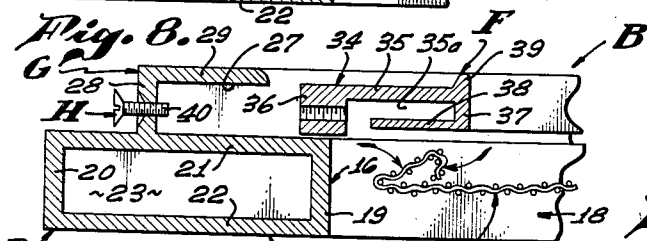
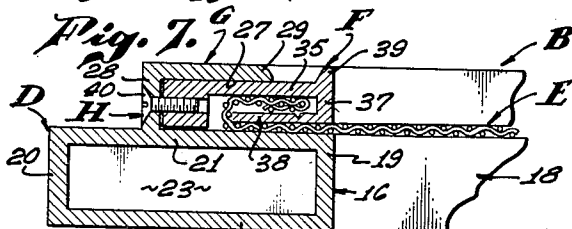
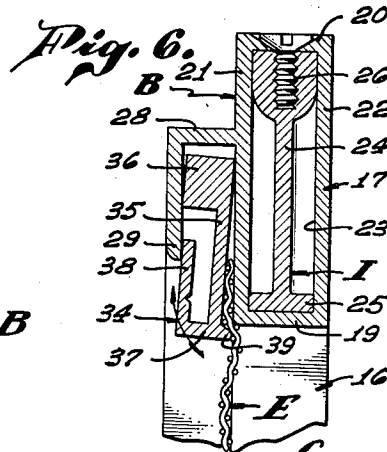
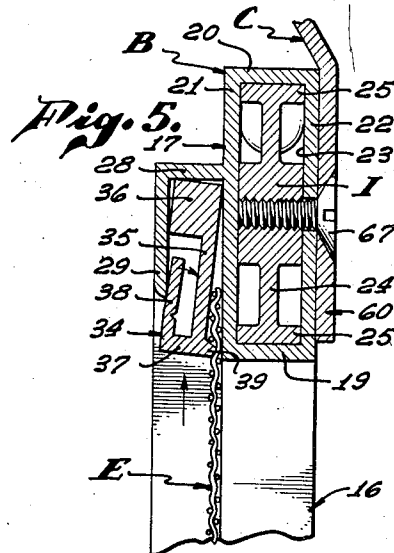
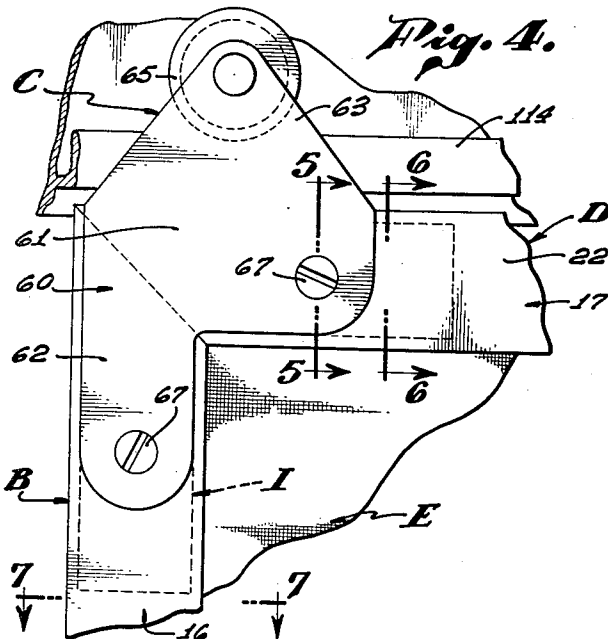
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SCREEN CONSTRUCTION FOR DOOR OPENING, OR THE LIKE

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2 Sheets-Sheet 2



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2,808,880

SCREEN CONSTRUCTION FOR DOOR OPENING, OR THE LIKE

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3 Claims. (Cl. 160—378)

This invention has to do with a screen construction for door openings, or the like, and it is a general object of the invention to provide a practical improved screen construction applicable to or adapted to be mounted in an opening in a building, as for example a door or window.

The screen construction that I provide includes generally, a rectangular sheet of screening material, a rectangular frame adapted to carry the sheet of screening material and made up of like, elongate rails releasably joined at their ends by like corner blocks. The screen construction further includes, retaining means characterized by elongate cleats occurring along each rail of the frame and having portions adapted to engage and hold the side edges of the sheet of screening material. The rails are provided with inwardly opening recesses that cooperate to form a suitable receiving means adapted to receive the cleats of the retaining means, and screw actuating means engageable with the cleats and adapted to draw the screen tight in the frame.

It has long been common practice to provide screen closures for doors, and the like, in buildings, which closures are generally characterized by rigid wood or metal frames, engageable in the frames of the doors or windows and carrying tightly drawn sheets of screen material therein. Due to the lack of facilities at the average building site and the inability of the average workman employed in building construction to properly draw or mount the screen material in the screen frames so that it is free of unsightly and undesirable waves and wrinkles, it has long been common practice to construct the screen frames and mount the screen material therein at a factory or mill where suitable facilities and skilled personnel are available.

Door and window screens thus manufactured require substantial space for storage and are awkward and difficult to handle, with the result that they are frequently warped, torn or otherwise damaged while in storage or when they are being transferred from their place of manufacture to the building site where they are to be employed.

It is a general object of this invention to provide a metal screen construction that is of simple, inexpensive form and construction, and which is applicable to a door or window opening to establish a finished, practical, working construction without resorting to the exercise of the special skill or services of a metal worker and without involving complicated time-consuming cutting, fitting and screen mounting operations.

Another object of this invention is to provide a screen construction of the general character referred to wherein the various elements entering into the structure may be assembled in knocked-down condition and packaged in compact form for transportation and final delivery to the point of installation, where the parts can be easily and quickly assembled with few simple operations.

It is another object of this invention to provide a screen construction of the general character referred to wherein

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the majority of parts involved may, in practice, be formed of simple unitary elongate extrusions, while the other parts may be advantageously formed as by casting.

It is a general object of the present invention to provide a screen construction of the general character referred to involving a construction, arrangement and formation of parts which minimizes joints and fitted constructions and such that the few cuts made or required in establishing the structure are simple straight cuts that can be made quickly, conveniently and economically.

It is another object of this invention to provide a screen construction of the general character referred to wherein the screening material is effectively supported and is retained in working position by very simple, inexpensive, easily and quickly applied construction, which is neat in appearance as well as being highly durable and efficient.

The various objects and features of my invention will be fully understood from the following detailed description of the typical preferred forms and applications of my invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a perspective view of a typical sliding door construction wherein there is one fixed panel and one movable panel, and showing the screen as provided by the present invention cooperatively engaged therein. Fig. 2 is an enlarged transverse sectional view taken as indicated by line 2—2 on Fig. 1. Fig. 3 is an enlarged detailed view of a typical corner of the screen provided by the present invention taken as indicated by line 3—3 on Fig. 1, and showing certain of the parts broken away. Fig. 4 is an enlarged view of a portion of the screen construction that I provide, and is taken substantially as indicated by line 4—4 on Fig. 2. Fig. 5 is an enlarged detailed sectional view taken as indicated by line 5—5 on Fig. 4. Fig. 6 is an enlarged detailed sectional view taken as indicated by line 6—6 on Fig. 4 and showing certain parts in the process of assembly. Fig. 7 is an enlarged detailed sectional view taken as indicated by line 7—7 on Fig. 4 and showing a modified form of the invention. Fig. 8 is an exploded view of the structure illustrated in Fig. 7. Fig. 9 is a view similar to Fig. 7 showing another modified form of my invention. Fig. 10 is a view illustrating certain of the elements shown in Fig. 9, in the process of assembly. Fig. 11 is a view taken as indicated by line 11—11 on Fig. 1.

In the drawings I have chosen to illustrate the screen construction, provided by the present invention, cooperatively engaged in a sliding door structure, which structure is shown as being installed in a wall W in a dwelling, or the like. It is to be understood, however, that the screen construction that I provide is not limited to use in connection with sliding doors only, but can be advantageously employed wherever screens having rigid frames are used.

The particular door construction that I have chosen to illustrate in the drawing, is characterized by a rectangular metal frame A having a horizontally disposed top beam or header 10, vertically disposed side columns or standards 11, and a horizontally disposed bottom beam or threshold 12. The door construction illustrated, further includes a fixed glass panel or window 13 which occurs in the frame adjacent one of the standards 11 and occupies about one-half of the opening established by the frame A, and a movable or sliding panel 14 establishing a door and suitably mounted in the frame to be selectively moved longitudinally in the frame to close the other half of the opening therein when the door is closed, and to overlie the back or inner side at the fixed panel 13 when the door or sliding panel is moved to an open position. The door construction illustrated further includes a movable or sliding screen B, which screen is

shown as being constructed in accordance with the present invention and is adapted to be selectively moved or rolled longitudinally of the frame to occur in front of the fixed panel 13 or to overlie and close the said other or open half of the opening in the frame A.

In the particular case illustrated, the header 10 of the door frame A is provided with a horizontally disposed upwardly facing screen track 114 adapted to be releasably engaged by a suitable roller mounting means C fixed to the upper side of the screen B, while the threshold 12 is provided with a groove 15 adapted to receive and guide the lower or bottom side of the screen B.

Since my present invention is concerned only with the screen construction and because the other details and features of the particular door construction illustrated in Figs. 1 and 2 of the drawings form no part of the present invention, further description thereof will be omitted.

The particular screen B provided by the present invention is characterized by a vertically disposed rectangular metal frame D, a sheet of plastic or wire mesh screen E, retaining means F adapted to engage and hold the screen E, receiver means G on the frame adapted to receive the retaining means F and actuating means H carried by the receiving means and engaging the retaining means to draw the screen tight in the frame and secure it in fixed position therein.

The vertically disposed rectangular frame D of the screen B is characterized by vertically disposed parallel side rails 16 and horizontally disposed parallel top and bottom rails 17 and 18 extending between and joining the ends of the side rails. Each of the rails of the frame D is alike and is formed of an elongate metal extrusion characterized by inner and outer parallel side walls 19 and 20, and parallel front and rear walls 21 and 22 that extend between and join the side walls. From the above it will be apparent that the metal extrusion from which the rails are formed is, in effect, a rectangular box section, and that each rail is further characterized by a central longitudinally disposed rectangular opening 23 extending therethrough and accessible at each of its ends.

The frame D further includes coupling means I adapted to releasably connect the ends of the rails together and at right angles where they join each other.

The coupling means I includes four like L-shaped blocks 24, each of which is in the form of a simple metal casting characterized by a pair of like elongate arms 25 arranged at right angles to each other and corresponding in cross sectional configuration with the longitudinal opening 23 in the rails 16, 17 and 18 of the frame and are so arranged that the arms 25 thereof are in longitudinal alignment with the openings 23 in the ends of the adjacent rails and are adapted to be slidably engaged therein.

In the preferred carrying out of the invention the adjacent ends of the rails forming the rectangular frame D are mitered, as at X, that is, their ends are cut at angles of 45 degrees so that they abut each other and form a right angle where they join, thereby establishing a neat corner construction that completely encloses the cast corner blocks 24 of coupling means I.

The coupling means I provided by the present invention further includes one or more longitudinally spaced screw fasteners 26 extending through the outer walls 20 of each rail and engageable in the corner blocks 24 adapted to secure the rails of the frame D in fixed, rigid relationship to each other.

It will be seen from the above that screen frames of varying size can be easily and quickly established by merely placing extruded stock in a miter box and cutting off sections of predetermined length, to establish the rails of the frame, and then inserting cast corner blocks 24 in the ends of the rails thus established. In the preferred carrying out of the invention the rails and the arms 25 of the corner blocks are drilled, and tapped if necessary, a predetermined distance from their ends to accommodate the screw fasteners 26, which drilling and tapping

operation can be performed in a suitable jig prior to assembly of the parts.

The receiving means G is adapted to receive a retaining means F which carries the screen E, and is in the nature of an inwardly opening recess 27 on the forward or front side wall 21 of the screen frame D. The recess 27 is established by a forwardly projecting rib 28 integrally formed on the front walls 21 of each rail and spaced from the inner side edge thereof and by an inwardly projecting flange 29 at the outer end of the rib 28 occurring in a plane offset from and parallel with the front wall 21 of the rail and overlying a portion thereof.

It will be apparent from the above that the ribs 28 on the rails establish the bottom walls in the recesses 27, and that the forward walls 21 of the rails and the inwardly projecting flanges 29 on the ends of the ribs 28 cooperate to establish the side walls thereof.

The retainer F adapted to retain and hold the screen E includes by four like elongate cleats 34, one occurring along each side of the frame D and engageable in the recesses 27 established by the ribs 28 and the flanges 29. The cleats 34 of the retaining means F are formed of elongate strips of extruded metal and each is characterized by an elongate flat body portion 35 adapted to occur in a plane substantially parallel with the front wall 21 of its associated frame rail, an enlarged rib-like projection 36 projecting laterally of the body at one side thereof and along the outer edge portion thereof, a flange 37 projecting laterally from said side of the body and extending along its inner edge portions, and an outwardly projecting lip 38 on the flange 37 occurring in a plane parallel with and offset from the plane of the body portion 35 and terminating short of the outer rib 36 on the body and defining a cavity 35a therebetween. Each cleat 34 further includes a bead-like projection 39 on the other side of the body 35 and extending along the inner edge thereof.

By suitably breaking or folding the screen E along its side edges in the manner illustrated in Fig. 8 of the drawings, the lips 38 of the cleats 34 can be advantageously engaged in the folds along the side edges of the screen to, in effect, hook the edges thereof. The cleats and screen thus engaged are then inserted in the recess 27 of the means G in the manner illustrated in Fig. 7 of the drawings, so that the lips 38 oppose the outer face 21 of the frame D, and so that the screen E occurs between the lips and the frame. With this relationship of elements, it will be apparent that the screen E is maintained in hooked relationship with the cleats 34 and will not slip or become disengaged from the cleats.

The actuating means H adapted to draw the screen tight and retain it in fixed position in the frame D includes a plurality of screw fasteners 40 spaced longitudinally of and projecting inwardly along the rib 28 of the receiving means G and engageable in the ribs 36 of the cleats 34 of the retaining means F. It will be apparent from the above that by suitably tightening the screws 40 of the actuating means H, the screen E can be tightened in the frame D.

It will also be apparent from Fig. 6 that the screen, if not folded or broken along its side edges in the manner referred to above, and illustrated in Figs. 7 and 8 of the drawings, can be arranged or positioned to overlie the outer forward wall 21 of the frame D, so that the edges of the screen enter the recess 27 of the receiving means G. The cleats 34 of means F are then positioned so that their body portions oppose the screen E and the front wall 21 of the frame D in the manner illustrated in Fig. 6 of the drawings. With the arrangement of elements set forth above it will be seen that upon initial outward movement of the cleats 34 into engagement with the recess 27 of the means G, the beads 39 on the cleats engage the inner side of the screen E and hold the screen in engagement with the forward inner edge of the frame D. Upon further engagement or outward movement of the cleats,

the beads 39 thereon ride over the forward inner edges of the frame so that the inner edges of the cleats are urged away from the front wall 21 of the frame D. Through this relationship of parts it will be seen that the outside surfaces of the lips 38 on the cleats are inclined relative to the flange 29 of the receiving means G and that further outward movement of the cleats causes the cleats to wedge themselves into the recess 27 of the receiving means G and, at the same time, drawing the screen E outward in the frame. The cleats in this form of the invention are frictionally held in engagement in the receiving means and the actuating means H need not be employed.

It will be apparent that both of the above mentioned arrangements of parts can be advantageously used or employed in a single screen construction. As for instance, the vertical sides of a screen embodying the present invention can be assembled in the manner shown in Figs. 7 and 8, while the top and bottom sides of the screen can be assembled in the manner shown in Figs. 5 and 6.

In Figs. 9 and 10 of the drawings, I have illustrated a third manner in which the screen E can be advantageously engaged in the retaining and receiving means F and G. In this form of the invention the screen E is engaged over or folded around an elongate resilient cord or insert 50, in the manner illustrated in Fig. 10 of the drawings. The inserts 50 and the screen E thus arranged are then forced into tight engagement between the ends of the lips 38 and ribs 36 of the cleats 34. The cleats are then arranged and inserted into the recesses 27 of the receiving means G, and the actuating means H is applied in the same manner as in the form of the invention illustrated in Fig. 7 of the drawings.

The door mounting means C adapted to releasably engage the screen track 114 of the door frame A to support the screen for free longitudinal movement in the door frame includes, generally, two like roller brackets 60 releasably secured to the upper corners of the screen frame D. Each bracket 60 includes a flat body portion 61 arranged in flat engagement with the inner wall 22 of the top rail 17 of the screen frame D, a flat leg portion 62 depending from one end of the body portion 61 to occur in flat bearing engagement with the inner wall 22 of the adjacent side rail 19 of the screen frame D, and, an upwardly projecting supporting tongue 63 on the body portion 61. A grooved roller 65 is rotatably carried by the tongue portion 63 of the bracket to occur above the screen frame D and engage the track 114 of the door frame A.

The brackets 60 of means C are releasably secured to the screen frame D by means of suitable screw fasteners 67 carried by the bodies 61 and the arms 62 of the brackets and engageable through the adjacent rails and into the corner blocks 24 of the coupling means I.

It is to be understood that the supporting means C may, if desired, be varied greatly in form and construction as circumstances may require, and that the particular means C illustrated is only typical of one manner in which my screen can be supported.

With the structure set forth above it will be seen that the screen construction that I provide can be advantageously handled and transported in a semi-assembled condition. For example, the vertical side rails and their respective retaining, receiving and actuating means F, G and H, can be advantageously assembled at a manufacturing site and rolled up with the screen to form an easy to handle elongate bundle, or unit. In like manner, the corner blocks 24 of the coupling means I, and the mounting brackets 60 of means C can be advantageously assembled with their respective top and bottom rails at the manufacturing site. The semi-assembled elements of my screen construction referred to above can then be placed in side by side relationship along with the two additional cleats 34 of the retaining means F, for the top and bottom rails. It will be apparent that the various elements of the screen E thus

arranged can be advantageously packaged in a manner that requires a minimum of space, and which is both easy and economical to handle and transport.

When the packaged, semi-assembled screen is delivered to a building site, a person can complete the assembly of the screen by simply unrolling the screen E and the side rails fixed thereto, place the top and bottom rails of the frame E in cooperative relationship with the side rails, apply the screw fasteners for the coupling means I and hanger brackets 60 in the side rails, and then insert the cleats 34 of the retaining means F in the top and bottom rails in the manner illustrated in Figs. 5 and 6 of the drawings, which operation can be accomplished with a minimum of time and effort and by any person with ordinary skill.

Having described only typical preferred forms and applications of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claims:

Having described my invention, I claim:

1. A rail construction for a screen frame of the character described including, an elongate rail with a flat laterally facing front wall, receiving means including an inwardly opening recess extending longitudinally of the rail, and an elongate cleat adapted to engage a side edge of a sheet of screening material and therewith engaged in and carried by the recess, the recess being defined by a rib projecting laterally outwardly from the said face on the rail and an inwardly projecting flange on the rib spaced from and overlying the face on the rail.
2. A rail construction for a screen frame of the character described including, an elongate rail with a flat face, receiving means including an inwardly opening recess extending longitudinally of the rail, and an elongate cleat adapted to engage a side edge of a sheet of screening material and therewith engaged in and carried by the recess, the recess being defined by a rib projecting outwardly from the face on the rail and a flange on the rib spaced from and overlying the face on the rail, the cleat including an elongate body with parallel edges, a bead along one edge projecting laterally from the body, the cleat being wedgeable into the recess with a sheet of screening material between the bead and the face on the rail.
3. A screen frame of the character described including, like parallel top and bottom and parallel side rails with flat faces, coupling means adapted to releasably join the rails together at their ends, receiving means including ribs on certain like faces of the several rails and flanges on the respective ribs spaced from and overlying the adjacent faces on the rails, the faces, ribs and flanges establishing an inwardly opening recess about the frame, retaining means including, an elongate cleat along each rail and engageable in the recess thereof, each cleat including, an elongate body with flat side and parallel edges, a rib along one edge and projecting laterally from one side of the body, a flange along the other edge and projecting laterally from the said side a lip on the flange and overlying the body and opposing the rib, a bead along said other edge of the cleat and projecting laterally from the other side, the rib, flange and lip on the body defining an elongate cavity, a sheet of screening material arranged in the frame to overlie the faces on said rails and having folded edges along the side rails, the folds of the screen engaged in the cavities of the respective cleats along the side rails and in hooked relationship with the lips of the respective cleats, actuating means including screw fasteners in the ribs on the side rail engaging the cleats to draw the screen tight between the side rails, the cleats along the top and bottom rails engaged in the recess, the lips on the cleats being

in wedging engagement with the flange of the receiving means and the screen engaged between the faces on the rails and the beads on the cleats.

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