

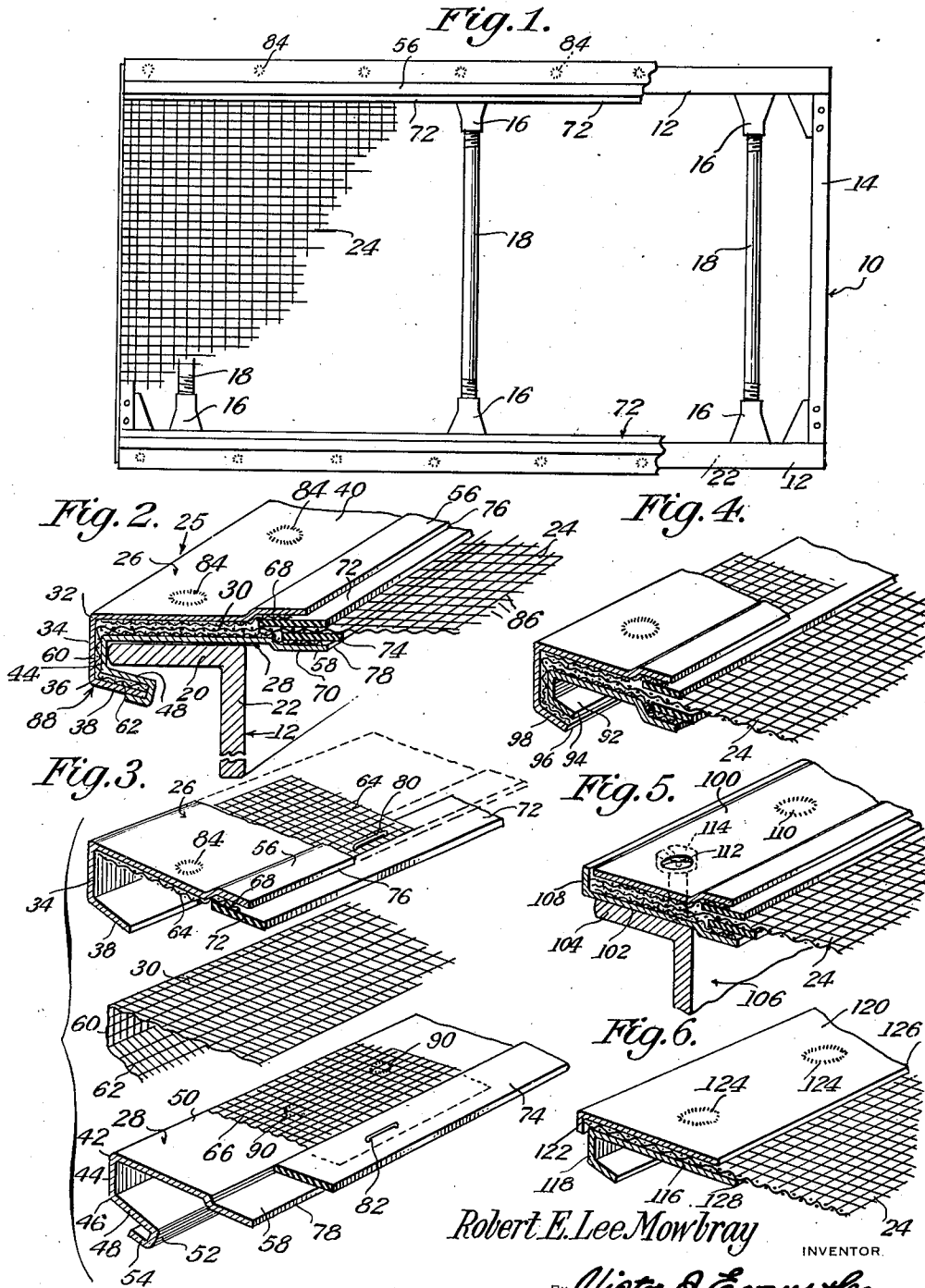
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SCREEN

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My invention relates to shaker screens and the like, and has among its objects and advantages the provision of improved binding means secured to certain margins of the wire mesh and fashioned for connection with tensioning means.

Shaker screens and various other types of screens employed for mechanical separation purposes are provided with binding means which usually extend along two margins of the wire cloth. Such binding means usually includes a hook-like formation for connection with an angle or other frame means for imparting the necessary tautness to the wire cloth. Such binding means usually comprises plate elements located on opposite faces of the enclosed screen margin with the parts secured into a unitary structure by spot welding. Cushioning strips are positioned between offset margins of the plate elements and the wire cloth, which cushioning strips are made secure by being clamped against the wire mesh when the plate elements and the mesh margin are welded into connected relation. In many cases the plate elements are fashioned from sheet metal bent back upon itself to provide the elements between which the margin of the screen is positioned. Two individual plates have also been employed. In all cases the plate elements and the screen margin are secured into a unitary structure and subsequently bent as a unit to provide a hook for connection with the tensioning frame.

In bending the binding and the screen itself to hook formation encounters many limitations, such as allowable thickness of the plate elements making up the binding, weight or thickness of the enclosed screen, and the impossibility of bending such a combination of plate elements and screen to the predetermined and exact fitting measurements essential to long screen life. Difficulties encountered in connection with conventional methods of fabricating screen bindings have been found to be responsible for much screen failure. Screen life can be assured only through a perfect fit between the hook and the tensioning member associated therewith, as well as an intact and undisturbed weld job between the plate elements and the screen margin. Bending of the binding to hook formation frequently disrupts welded connections and causes relative displacement of the plate elements in such degree as to impair the wire cloth. In addition, it is essential that the offset margins of the plate elements maintain parallel relation with the screen cloth so as to effectively hold the cushioning strips in pressure relation with the

enclosed screen margin. The resulting wedge-shaped opening between the offset margins of the plate elements permits entrance of foreign materials and greatly accelerates the impairment and destruction of the screen cloth.

Accordingly, an object of my invention is to provide a screen of the type described embodying a binding means for the margins of the wire mesh, which binding means comprises at least two plates between which the margin of the wire mesh is effectively clamped through welding of the parts into a unitary structure, with the plates preformed to have exact interfitted relation to provide a hook for connection with a tensioning member. The plates are also preformed to provide offset margins between which and the wire mesh I position cushion strips, which are related in such manner as to provide two offset general lines of bend in the wire mesh adjacent the binding means.

Another object is to provide a screen of the type described in which the wire mesh is maintained under tension through the medium of an adjustable frame, wherein the wire mesh is provided with binding means along certain margins made up of plates preformed to provide hook formations for connection with the frame and in which said margins of the wire mesh are located between the plates and the parts welded into a unitary structure.

A further object is to provide a screen of the type described in which the margins of the wire mesh are effectively clamped between two metallic plates with at least one of the plates bent to provide a hook for connection with a supporting and tensioning frame and in which the parts are preformed, assembled and subsequently welded into a unitary structure with the margin of the wire mesh secured between the plate elements.

A further object is to provide a novel method of fabricating a screen marginal binding so as to effectively anchor the margin to the binding, in addition to permitting the use of relatively heavy sheet material for the binding parts.

In the instant case, the plates are preformed and fashioned for exact interfitted relation with the margin of the screen located between the plates and the parts welded into a unitary structure. Such preforming permits the use of much heavier gauge metal than is used in common practice. The thickness or weight of the screen is not limited as it is separately bent to shape to conform to the definite preformed contours of the plates.

In the accompanying drawing:

Figure 1 is a plan view of a screen embodying my invention;

Figure 2 is an enlarged sectional perspective view of one of the tensioning members illustrating the manner in which the margins of the wire mesh are made secure;

Figure 3 is a perspective view of the structure illustrated in Figure 2 with the parts separated for the purpose of illustration;

Figure 4 is a view similar to Figure 2 illustrating a modification;

Figure 5 is a view similar to Figure 4 but illustrating a further modification; and

Figure 6 is a view similar to Figure 5 but illustrating a further modified form of fastening means.

In the embodiment selected to illustrate my invention, I make use of a screen supporting and tensioning frame 10, which includes side members 12 and end members 14 each of which may comprise angles. Both side members 12 are provided with threaded sockets 16 for connection with rods 18 oppositely threaded at their ends so that the side members 12 may be adjusted toward and away from each other through rotation of the rods. Both end members 14 are so related to the side members 12 as to permit relative shifting of the side members. Figure 2 illustrates one of the side members 12 in cross section, which member has its flange 20 lying in a horizontal plane and the flange 22 lying in a vertical plane, the latter flange serving as a mount for the sockets 16 associated with that side of the frame.

The wire mesh 24 of Figure 1 is mounted on the frame 10 and is maintained under tension through the medium of the tension rods 18. Each side margin of the screen 24 is fastened throughout its entire length to binding means 25 which has hooked connection with one of the side members 12. Figure 2 illustrates one of the binding means in cross section in combination with one of the frame members 12. According to Figures 2 and 3, I make use of two preformed metallic plates 26 and 28 which are located on opposite sides of the margin 30 of the wire mesh 24.

Plate 26 is bent at 32 to provide a right-angular flange 34 bent at 36 to provide a flange 38 arranged at an acute angle to the area 40 of the plate 26. Plate 28 is bent at 42 to provide a flange 44 paralleling the flange 34. Flange 44 is bent at 46 to provide a flange 48 arranged at an angle to the area 50 of the plate 28 corresponding to the angularity between the flange 38 and the area 40 of the plate 26. I bend the flange 48 back upon itself at 52 to provide a hook 54 within which the outer margin of the flange 38 is positioned when the two plates are assembled, see Figure 2.

The area 40 of the plate 26 is offset outwardly to provide a flange 56 which parallels the area 40. Similarly, the area 50 of the plate 28 is offset outwardly to provide a flange 58 which parallels the area 50. Margin 30 of the wire mesh 24 is preformed to provide a run 60 located between the flanges 34 and 44 and a run 62 located between the flanges 38 and 48, with the edge of the run 62 lying close to the bight of the hook 52. Between the areas 40 and 50 and the margin 30 I position strips of wire mesh 64 and 66, each of which has one edge terminating at the flange 34. The opposite edges of the strips 64 and 66 extend partly underneath their respective flanges 56 and

58, as at 68 and 70, respectively, see Figure 2. Between the portion 68 and the margin 30 I interpose a cushion 72 which may comprise a rubber strip. A cushion 74 is interposed between the portion 70 of the wire mesh 66 and the margin 30, which cushion may also comprise a rubber strip. Referring to Figure 2, it will be noted that the cushion 72 extends beyond the edge 76 of the offset flange 56 and that the cushion 74 extends beyond the edge 78 of the offset flange 58.

Figure 3 illustrates the parts of Figure 2 preparatory to assembling the parts into a unitary structure. The cushion 72 is stapled at 80 to the mesh 64 at suitable intervals for holding the parts in assembled relation and true alignment. Cushion 74 is stapled at 82 to the mesh 66 at suitable intervals for connecting the parts in assembled relation and proper alignment. Mesh 66 is then placed in position on the area 50 with the cushion 74 lying upon the flange 58. Mesh 24 is then positioned with its margin 30 lying on the mesh 66 and its runs 60 and 62 embracing the flanges 44 and 48 of the plate 28. Mesh 64 is assembled with the plate 26 with the cushion 72 lying underneath the flange 56, after which the plate 26 is placed in position with its flanges 34 and 38 embracing the runs 60 and 62 of the margin 30. Plate 26 is then adjusted to position and all the parts are connected into a unitary structure by spot welding 84 at suitable intervals. The runs 60 and 62 of the margin 30 are pressed between the flanges 34 and 38 of the plate 26 and the flanges 44 and 48 of the plate 28. The margin 30 is tightly clamped between the two strips of mesh 64 and 66 throughout its entire length so as to be securely fastened. Wires 86 of the mesh 24 are arranged at right angles to the side members 12. These wires are placed under tension through adjustment of the rods 18 and the screen unit is effectively connected with the side members through tensioning of the mesh 24. Figure 2 illustrates the area 50 and the flanges 44 and 48 as defining a hook 88 which hooks over the flange 20 of the frame member 12. Adjustment of the rods 18 will press the edges of the flanges 20 against the bights of the hooks 88 so as to effectively secure the mesh 24 to the frame members 12.

In operation, the screen is vibrated in the usual manner, which causes the mesh 24 to bend along lines closely adjacent the side members 12. Figure 2 illustrates the cushions 72 and 74 as extending beyond the flanges 56 and 58 so as to protect the mesh 24 from direct engagement with the flanges. Cushions 72 and 74 are pressed gently between the flanges 56 and 58 and the cushions are of such widths as to have cushioning relation with a considerable area of the mesh 24. Bending the mesh 24 downwardly, when viewing Figure 2, will locate the line of bend along the edge 78 of the flange 58 with the projecting margin of the cushion bending along the line of the edge 78. However, cushion 72 is of such thickness and resiliency as to yield effectively to any bending action of the mesh 24 so that the latter will bend gently throughout an arc of considerable length. Similarly, bending the mesh 24 upwardly will flex the cushion 72 upwardly about the edge 76, with the general line of bend located to one side of the line of bend determined by the flange 58. Thus the mesh 24 will bend generally along two spaced lines so that the bending action imparted to the mesh is distributed throughout a larger area of the mesh along two

general lines, thus prolonging the life of the mesh.

The two strips of mesh 64 and 66 constitute effective binder means when clamped between the plates 26 and 28 so that the margin 30 is effectively secured throughout the entire overlapping areas of the plates 26 and 28. Cushions 72 and 74 eliminate all metallic contact between the flanges 56 and 58 so that any bending action imparted to the mesh 24 is localized within and about the cushions 72 and 74. In view of the effective anchorage of the margins 30, the mesh 24 may be placed under any necessary tension without any danger of rupturing the mesh or impairing its anchored margins.

In assembling the parts of Figure 3, the mesh strips 64 and 66 may be spot welded at 90 to their respective areas 40 and 50 to facilitate assembly of the parts. After assembly, the parts will be spot welded as indicated at 84 in Figure 2.

In my invention, margin 30 is securely fastened while the cushioning means is located between the firm anchorage for the margin and the body of the mesh 24. The cushioning means are of such width as to cushion the flexing area of the mesh 24 between the plates 26 and 28 so that bending of the mesh occurs in advance of the fixed connection between the mesh and the plates.

All the parts of Figure 3 are preformed in every detail before assembly so that the parts will have close and exact interfitting relation. The margins of the wire cloth are effectively secured through spot welding of the parts, and the screen is anchored in the binding means in such manner as to be uniformly tensioned throughout its full length. Preforming of all the parts permits much heavier sheet material to be utilized and no difficulty is experienced in forming heavy wire cloth. Flanges 56 and 58 are preformed to have true parallel relation so as to maintain the cushioning strips 72 and 74 in effective pressure relation with the wire mesh so as to insure uniform cushioning for the screen in addition to maintaining a sealed condition which prevents the entrance of foreign material.

Figure 4 illustrates a construction identical with that illustrated in Figure 2 with the exception that the flange 92 corresponding to the flange 48 terminates at 94 flush with the edge 96 of the flange 98 corresponding to the flange 38. All the parts of Figure 4 are preformed. Figure 5 illustrates plates 100 and 102 of widths slightly greater than the flange 104 of the angle 106 corresponding to the angle 22. Plate 102 is flanged upwardly at 108 to terminate flush with the upper face of the plate 100. In other respects the mesh 24 is clamped between the plates 100 and 102 in the same manner as illustrated in Figure 2, and the parts are preformed to shape. These plates are spot welded at suitable intervals 110, and the plates, together with the screen wire therebetween, are provided with openings 112 at suitable intervals for the reception of bolts 114 which extend through openings in the flange 104 for bolting the mesh to the angle. In Figure 4, the mesh is connected with the angle through a hooked connection in the manner of Figure 2.

In Figure 6, the plate 116 is provided with a hook 118 corresponding to the hook on the plate 28. The plate 120 is bent to provide a downwardly extending flange 122 partly overlapping the hook 118. The mesh 24 is positioned be-

tween the plates 116 and 120 and the margin of the screen is anchored through spot welding 124. Plates 116 and 120 have their edges 126 and 128, respectively, offset in the same manner as the edges 76 and 78 of Figure 2. All the forms anchor the mesh 24 in such manner as to provide offset lines of bend for the mesh.

Without further elaboration, the foregoing will so fully illustrate my invention that others may, by applying current knowledge, readily adapt the same for use under various conditions of service.

I claim:

1. Screen fastening means comprising metal plates fitting a margin of a wire screen, said metal plates being disposed on opposite sides of said margin and having contacting engagement therewith, said metal plates and said margin being spot welded into a unitary structure, said metal plates having offset margins, and cushioning means between said offset margins and said screen adjacent the screening area thereof.

2. Screen fastening means comprising metal plates fitting a margin of a wire screen, said metal plates being disposed on opposite sides of said margin and having contacting engagement therewith, said metal plates and said margin being spot welded into a unitary structure, said metal plates having offset margins, and cushioning means between said offset margins and said screen adjacent the screening area thereof, at least one of said metal plates being fashioned to provide a tensioning hook.

3. Screen fastening means comprising metal plates fitting in contacting engagement with the opposite sides of a correspondingly shaped margin of a wire screen, at least one of said metal plates being fashioned to provide a tensioning hook, said metal plates and said margin being welded into a unitary structure, said metal plates having offset flanges adjacent the screening area of said screen, and cushioning means between said offset flanges and said wire screen, said offset flanges on one side of the screen being relatively offset from the flanges on the other side of the screen in the plane of said screening area to provide two general lines of bend for the wire screen.

4. The combination of a screening mesh, plates on opposite sides of a margin of the screening mesh, said plates fitting said margin and arranged in contacting engagement therewith, means for clamping said margin between said plates, said plates having margins spaced from said screen adjacent the screening area thereof, cushioning means interposed between said last-mentioned margins and said screen, a frame member, and means cooperable on said plates and said frame member for fixedly relating the same.

5. The combination of a wire mesh having a margin of channel-shaped configuration, metal plates of channel-shaped configuration disposed on opposite sides of said margin, one of said plates having a channel-shaped formation to receive a margin of the other plate, said plates and said margin of the screen being welded into a unitary structure, said plates having flanges offset from said wire mesh adjacent the screening area thereof, and cushioning elements positioned between said flanges and the wire mesh, said flanges being relatively offset in the plane of said screening area to provide two general lines of bend for the wire mesh.

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