

March 30, 1943.

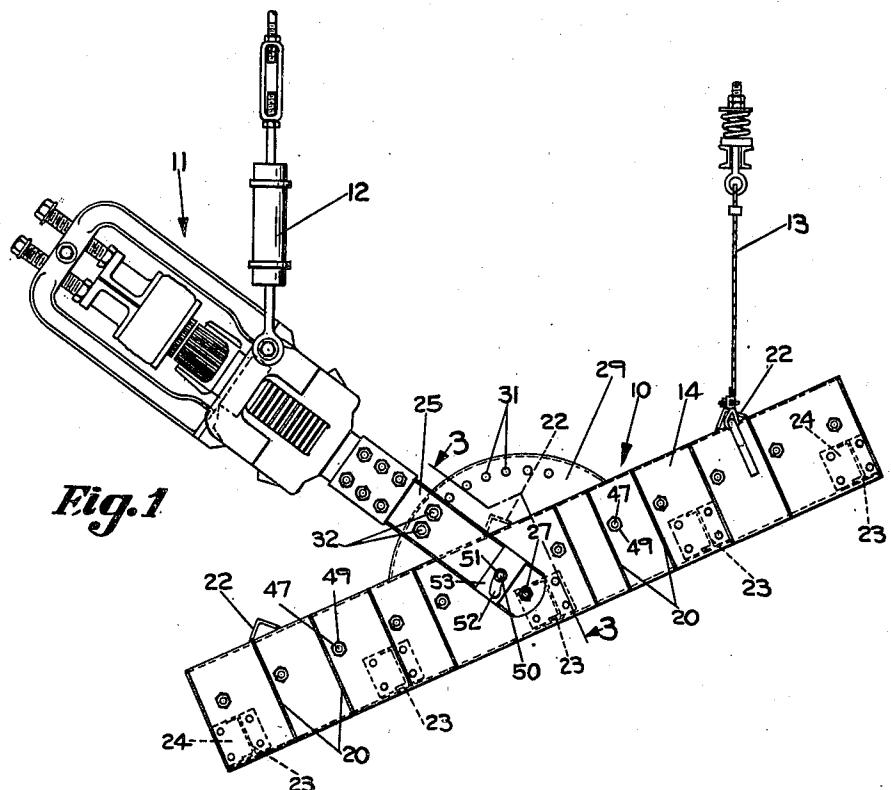
R. D. HELLER

2,314,878

SCREEN

Filed May 12, 1939

2 Sheets-Sheet 1



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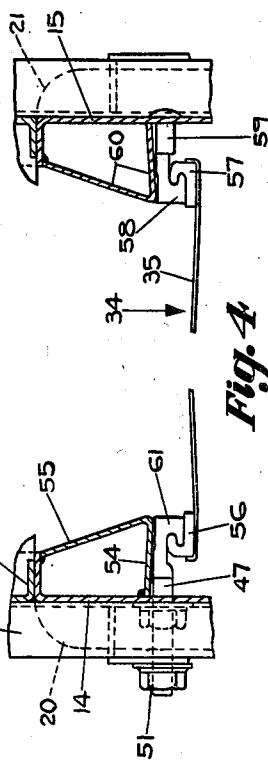
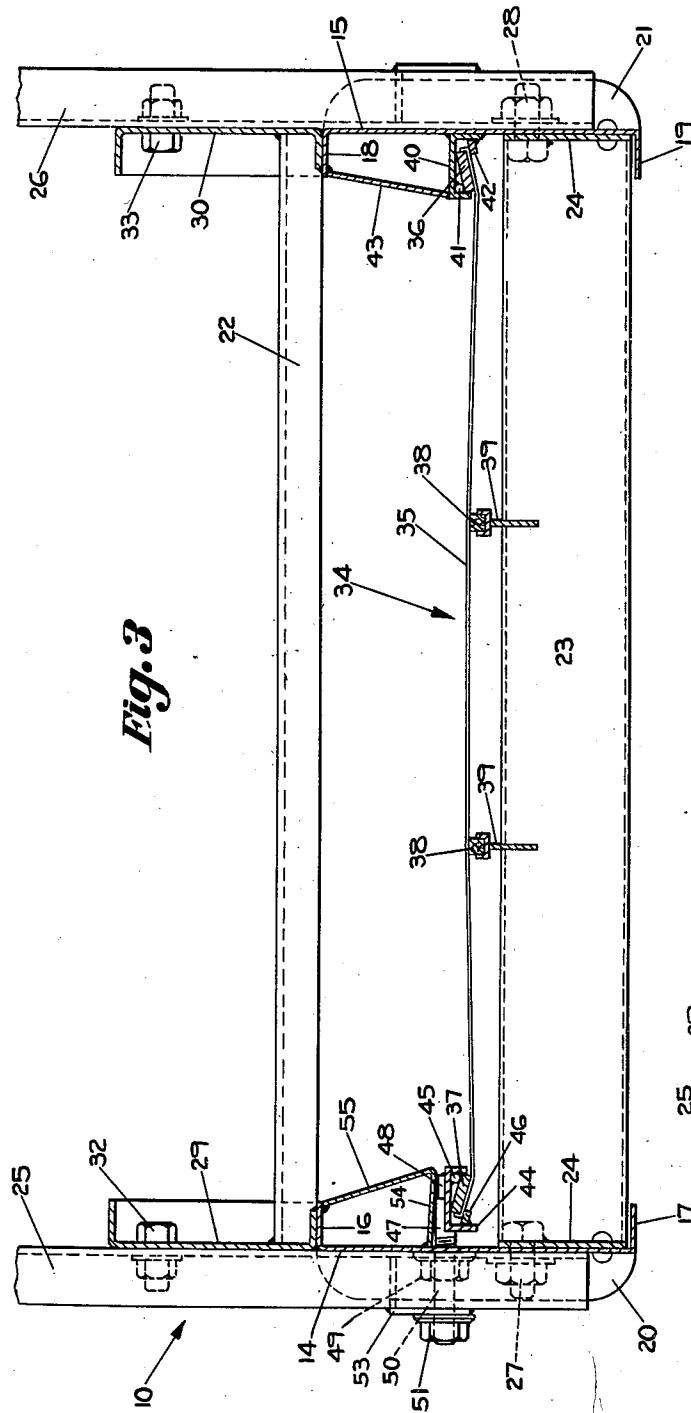
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UNITED STATES PATENT OFFICE

2,314,878

SCREEN

Richard D. Heller, Boise, Idaho

Application May 12, 1939, Serial No. 273,328

11 Claims. (Cl. 209—400)

This invention relates to a screen and more particularly to an improved form of screen frame or screen deck.

An object of the invention is to provide an improved screen and an improved screen deck in which the deck is provided with reinforcing and guide means of an improved and simple structure.

Other objects of the invention will appear hereinafter, the novel features and combinations being set forth in the appended claims.

In the accompanying drawings,

Fig. 1 is a side elevational view of the screen comprising my invention;

Fig. 2 is a rear elevational view of the screen of Fig. 1;

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 1, looking in the direction of the arrows; and

Fig. 4 is a view similar to Fig. 3 with certain parts removed and which is foreshortened showing a modified form of screen cloth tensioning means.

Except for the improved structure of the screen deck or sash it may be stated that the complete screen comprising my invention follows generally the disclosure of the patent to James A. Flint, No. 2,153,243, dated April 4, 1939.

Briefly described, the screen comprises a deck or sash 10 which is adapted to be vibrated by a vibratory motor 11 of the type disclosed more in detail in the above mentioned patent to James A. Flint. The complete screen structure is supported by shock-proof hangers 12, 12 which are attached directly to the motor 11 and one or more hangers 13 attached to the deck or sash 10.

The deck or sash 10 is formed by a pair of upright spaced metal side members 14 and 15 which are preferably in the form of channels in that they have integral top and bottom flanges, those associated with the side member 14 being seen at 16 and 17, respectively, and those associated with side member 15 being seen at 18 and 19.

The side members 14 and 15 are also provided with outwardly extending reinforcing webs 20 and 21, respectively. Extending transversely across the tops of the side members 14 and 15 and rigidly attaching them together is a plurality of angle members 22, of which there are three illustrated in Fig. 1 of the drawings. Extending across the bottoms of the side members 14 and 15 and also rigidly attaching them together is a plurality of channel members 23 of which there are five, as illustrated in Fig. 1 of the drawings. The channel members 23 have their

ends rigidly attached to attaching plates 24, as by welding, which attaching plates 24 are preferably riveted to the adjacent side members 14 and 15. It is thus seen that a very rugged deck or sash 10 has been provided.

The motor 11 is attached to the deck 10 by a pair of spaced channel shaped arms 25 and 26 pivotally attached, as by bolts 27 and 28, respectively, to the side members 14 and 15.

10. To provide for an angular adjustment between the arms 25 and 26 and the plane of the deck or sash 10 the side members 14 and 15 are provided with arcuate flanged plates 29 and 30, respectively, which are provided with a plurality of holes, those in the plate 29 being seen at 31, which are adapted selectively to receive removable bolts 32 and 33, respectively, which extend through holes in the arms 25 and 26 which are aligned with the aforementioned holes in plates 29 and 30 which are seen at 31 in plate 29.

Extending between the side members 14 and 15 is a screen cloth 34 which preferably takes the form of the screen cloth disclosed and claimed in my copending application Serial No. 234,014, filed 25 October 8, 1938, Patent No. 2,283,877, granted May 19, 1942, for a Screen, but it is understood that other types of screen cloth may be employed.

Briefly described, the screen cloth 34 comprises a plurality of non-woven or parallel wires 35 which are preferably formed of high carbon steel. The opposite ends of each of the wires 35 are rigidly attached, as by soldering, to end bars 36 and 37. Intermediate the ends of each of the wires 35 the screen cloth 34 is supported by longitudinally extending wood strips 38 supported in channel guides 39 which extend longitudinally of the deck or sash 10 and are supported upon and rigidly attached to the channel members 23.

It has been found in practice that a screen cloth, particularly when formed of these parallel strands of high carbon steel, need to be tensioned at a very high tension and consequently it is necessary to make the side members of the deck or sash very strong to prevent their buckling or distorting when the screen cloth 34 is tensioned. It is also necessary to assure proper alignment of adjacent wires 35 of the complete screen cloth 34 when said screen cloth 34 is made up into a plurality of sections, as it often is. That is, there will be a plurality of sections forming a complete screen cloth 34 each including separate pairs of end bars 36 and 37 with rigidly attached wires 35. It is furthermore desirable to have a guide for the material which 55 is fed to the screen to insure its discharge onto

the active part of the screen cloth 34 and to keep it off the attaching means or tensioning means. I have provided a simple but very effective structure which accomplishes all three of these results which I will now describe.

Attached to and extending longitudinally of the side member 15 is an inverted channel member 40. This channel member 40 extends inwardly of the side member 15 and at its inner corner is provided with a rod 41 welded thereto which cooperates with a ledge 42 welded on the opposed flange of the channel member 40 to form an attaching means for the end bar 36. The channel member 40 cooperates with an upwardly extending and outwardly sloping plate 43 which is welded at its bottom to the channel member 40 and at its top to the top flange 18 of the side member 15. It is evident that the flange 18, plate 43, channel 40 and cooperating portion of the side member 15 cooperate to form a box-like reinforcing and guiding member.

The end bar 37, or plurality of end bars, if there is more than one section to the screen cloth 34, is attached by an attaching mechanism comprising an inverted channel 44 having a rod 45 extending along and welded into the outer corner thereof and a ledge 46 extending along and welded to the opposite flange thereof which forms an attaching means for the end bar 37. If desired, there may be a single channel 44 which extends the full length of the deck or sash 10 to receive the successive end bars 37 of the several sections of the screen cloth 34 or, if otherwise desired, and preferably, there is a channel 44 with the cooperating end bar attaching means above described for each section of said screen cloth 34, each of which several channels 44 may be individually adjusted.

To provide for the adjustment of the channels 44, each of them is provided with a plurality of rigidly attached adjusting bolts 47 which are welded to the channel 44 and abut a metal strip 48 also welded to the top of the channel 44. The bolts 47 extend through apertures in the side member 14 and are provided with adjusting nuts 49 and associated washers. By reference to Fig. 1 of the drawings, it will be seen that the bolts 47 and nuts 49 are in longitudinal alignment along the side member 14 of the deck or sash 10.

It may also be noted that a special bolt 50 and a cooperating nut and washer 51 is provided at substantially the center of the deck 10 and extends through arcuate slots, one of which is seen at 52 in a cross-plate 53 carried by the webs of the channel arm 25. This special bolt 50 performs the same function as the bolts 47 and it is so connected to permit the adjustment of the arms 25 and 26, as above described. If the arms 25 are swung beyond the extent of the slots 52 the special bolt 50 may be removed and placed outside the extremity of said arm 25.

From the above description it is evident that each of the channel members 44 is provided with a plurality of bolts 47 or 47 and 50 so that they may be adjusted to tension the various sections of the screen cloth 34.

It is particularly necessary to provide rigid reinforcement for the side member 14 and at a position adjacent the attaching and tensioning means for the screen cloth 34. To this end I provide a box-like rigid structure which, as above mentioned, not only reinforces the side member 14, but also acts as a guide to insure proper

alignment of the adjacent wires 35 of two adjacent sections of the screen cloth 34 and further acts to direct material onto the screen cloth 34 and keep it off the attaching and tensioning means including the channels 44. This box-like structure is formed by a bottom web or plate 54 which extends inwardly and substantially at right angles to the plane of side member 14 and is rigidly attached thereto, as by welding, and at a position slightly above and adjacent to the holes in plate 14 which receive the bolts 47 and bolt 50. The bottom web or plate 54 is provided with an integral, upwardly and outwardly extending plate or member 55, the top of which is rigidly attached to the flange 16 of the side member 14, as by welding, along their contacting edges.

It is thus seen that a box-like structure is provided which has the reinforcing and guiding characteristics above set forth which is very light in weight and yet which is very effective to reinforce the side member 14 which is particularly desirable with a screen cloth of the above mentioned type due to the necessary great tensioning thereof.

It is evident by reference to Fig. 3 of the drawings that the tops of bolts 47 and of the metal strips 48 rest against the bottom web or plate 54 to insure the proper alignment of adjacent wires 35 of adjacent sections of screen cloth 34.

In Fig. 4 of the drawings I have illustrated a slightly different type of attaching and adjusting means for the screen cloth 34. In this structure the wires 35 are rigidly attached, as by soldering, to hook plates 56 and 57. Hook plate 57 is hooked to a cooperating hook plate 58 which is provided with a plurality of rivets 59 rigidly attached thereto, as by welding, which are riveted to side member 15.

A box-shaped reinforcing and guiding structure 60, similar to that above described, including plates 54 and 55, is provided adjacent the side member 15 and the lower inner edge thereof is preferably welded to the inner edge of the hook plate 58. The channel 44 and associated structure has been replaced by a hook plate 61 which is provided with a plurality of bolts similar to the aforescribed bolts 47 and 50, the hook plate 61 cooperating with the bottom plate 54 substantially in the manner of the cooperation between the channel 44 and strip 48, as above described.

Here again, if the screen 34 is formed in a plurality of sections there will, of course, be individual hook plates 56 and 57 for each individual section and there may be one hook plate 61 which is common to all of the hook plate 56 or there may be an individual hook plate 61 for each hook plate 56. There is preferably only a single hook plate 58 since it is rigidly attached to the deck or sash 10 and is not adjustable regardless of whether the screen cloth 34 is made in one section or a plurality of sections.

From the above description it is evident that I have provided a very simple but rigid reinforced deck or sash and one which is particularly useful where the screen cloth is subject to high tension, such as a parallel strand high carbon wire type of screen cloth. Furthermore, guide means are also formed to insure proper alignment of adjacent wires of adjacent sections of a sectional screen cloth and a guide is provided for the material to be screened to insure its reaching the

screen cloth and being kept off the attaching and tensioning structure of the screen cloth.

Obviously those skilled in the art may make various changes in the details and arrangement of parts without departing from the spirit and scope of the invention as defined by the claims hereto appended, and I therefore wish not to be restricted to the precise construction herein disclosed.

Having thus described and shown an embodiment of my invention, what I desire to secure by Letters Patent of the United States is:

1. A screen deck comprising the combination with a frame formed of spaced upright metal side plates at least one of which has an inwardly extending top flange, of a reinforcing structure formed by rigidly securing an inverted channel to said one side plate and connecting the inner edge of such inverted channel by an upright plate to the inner edge of said top flange, and screen cloth attaching means mounted in the underside of said inverted channel.

2. A screen deck comprising a side plate having an inwardly extending top flange, a support, mechanism comprising a rivet for rigidly securing said support to said side plate, a reinforcing plate on said support and having its upper edge rigidly secured to the inner edge of said flange, and screen cloth attaching means carried by said support.

3. A screen deck comprising a side plate having an inwardly extending top flange, a support, means rigidly securing said support to said side plate, a reinforcing plate having its lower edge rigidly secured to said support and having its upper edge rigidly secured to the inner edge of said top flange, and screen cloth attaching means mounted on said support.

4. A screen deck comprising a side plate having an inwardly extending top flange, a support, means for rigidly securing said support to said side plate, a V-shaped reinforcing plate on said support with its upper edge rigidly secured to the inner edge of said top flange, and a screen cloth attaching device carried by said support, said V-shaped reinforcing plate being mounted in position to guide material from said attaching device onto the screen cloth carried by the deck.

5. A screen deck comprising the combination of a frame formed of spaced upright metal side plates at least one of which is a channel having a top flange extending inwardly and having intermediate its top and bottom flanges a series of aligned bolt receiving apertures, and a box-like structure extending along the inner side of said channel immediately above said bolt receiving apertures and serving as reinforcing and guiding means, said box-like structure comprising a bottom rigidly secured to said channel immediately above said apertures and at right angles to the vertical plate of said channel to extend inwardly therefrom with an inner wall sloping upwardly from said bottom toward a top parallel to the bottom and rigidly secured to the top flange of said channel.

6. A screen deck comprising the combination of a frame formed of spaced upright metal channels with their flanges extending inwardly, the vertical plate of one of the channels having a series of aligned screen cloth bolt receiving apertures located intermediate the flanges of such channel, and reinforcing and guiding means extending longitudinally along such vertical plate

and having the form of a rigid box-like structure, the latter having as its outside wall a portion of said vertical plate and having its opposite wall sloping upwardly with its upper edge secured to the inner edge of the top flange of said channel, the bottom of said box-like structure being parallel to said top flange and secured rigidly to the said vertical plate with such bottom immediately above and closely adjacent to said bolt receiving apertures.

7. A screen deck comprising a frame formed of spaced-apart pairs of superimposed channels, screen cloth attaching means between the lower channels, a reinforcing plate extending inwardly from the vertical plate of one of the lower channels and having one edge rigidly secured to such vertical plate immediately above and closely adjacent said attaching means, and an extension from the inner edge of said reinforcing plate sloping upwardly and outwardly to the upper inwardly extending flange of the adjacent channel with the upper edge of said extension rigidly secured to such inwardly extending flange to complete a box-like structure with a portion of said vertical plate forming one wall of such structure.

8. A screen deck comprising the combination with a frame comprising spaced-apart upright metal plates at least one of which has an inwardly extending top flange, of reinforcing structure comprising a bottom support rigidly secured to said one side plate and an upwardly and outwardly sloping plate secured rigidly at its lower edge to said bottom support and secured rigidly at its upper edge to the inner edge of said flange, and screen tensioning means engaging the lower side of said support and adapted to act only along horizontal lines while remaining at all times in engagement with said lower side of said bottom support.

9. A screen deck comprising a channel having flanges extending inwardly from the upper and lower edges of an upright plate, an inverted channel having one of its flanges secured to said upright plate, a reinforcing plate having its lower edge rigidly secured to the inner edge of said inverted channel and having its upper edge rigidly secured to said channel, and screen cloth attaching means on the under side of said inverted channel.

10. A screen deck comprising spaced-apart metal upright side plates, an inverted channel having one of its flanges rigidly secured to one of said upright side plates, means comprising an upwardly and outwardly inclined plate secured at its lower edge to the inner edge of said inverted channel to reinforce the latter to form a rigid anchorage, and screen cloth attaching means on the underside of said inverted channel.

11. A screen deck comprising spaced-apart metal upright side plates, an inverted channel rigidly anchored to one of said plates, another inverted channel adjacent the other upright side plate, tensioning mechanism connected to said second-named inverted channel and comprising a series of screw-threaded rods spaced apart along said last-named upright side plate, screen cloth attaching means on the undersides of said inverted channels, and a plate rigidly connected to the first-named inverted channel and to the adjacent upright side plate to reinforce the channel as a rigid anchorage for the screen cloth attaching means associated therewith.

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