Sept. 6, 1938. E. E. JOHNSON 2,129,428

FLAT SCREEN

Original Filed Nov. 10, 1934

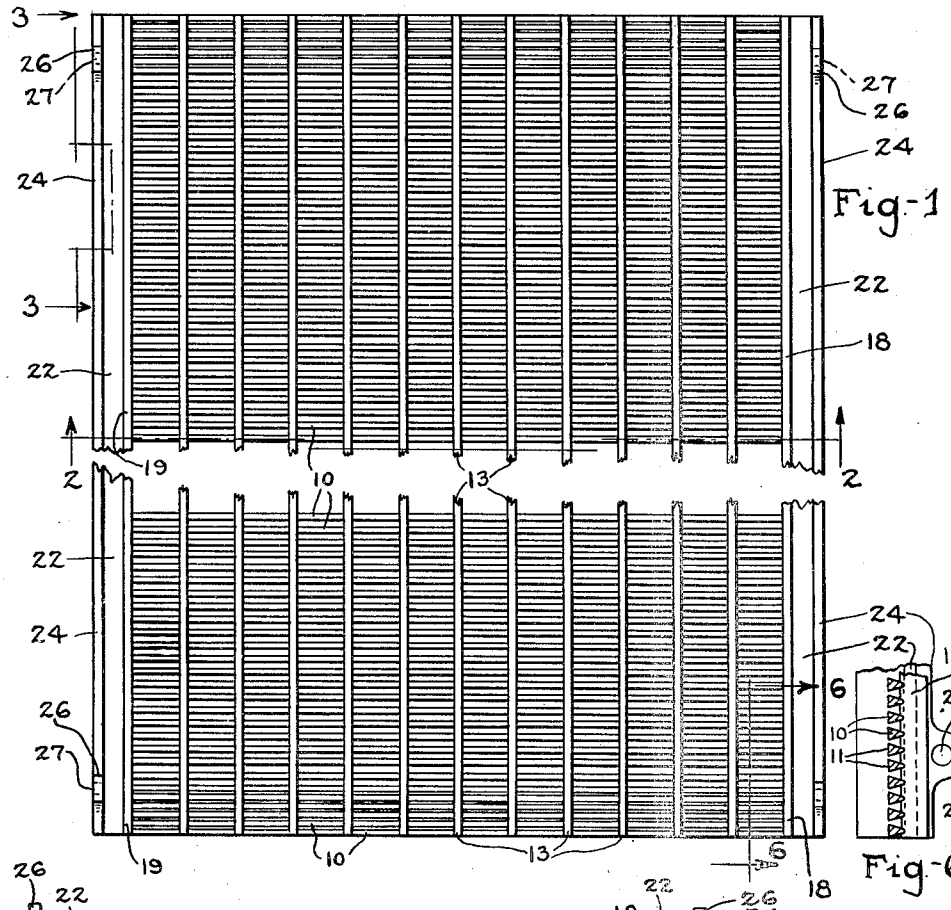


Fig-1

Fig-6.

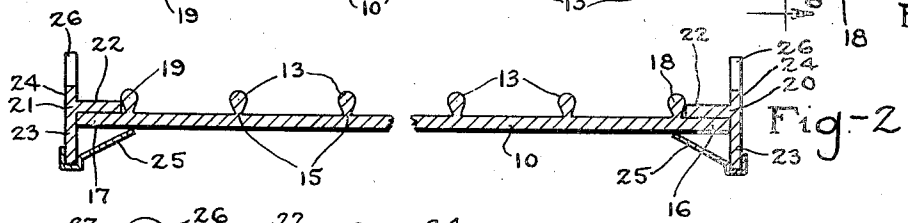


Fig-2

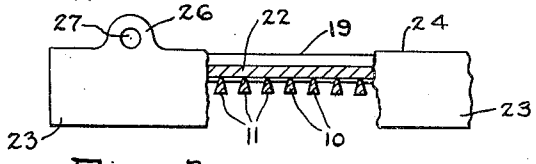


Fig-3

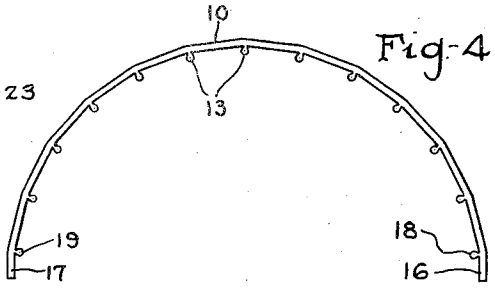


Fig-4

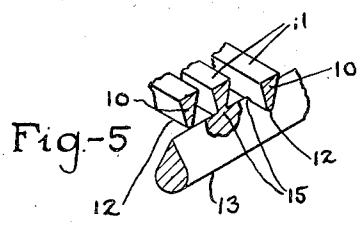


Fig-5

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UNITED STATES PATENT OFFICE

2,129,428

FLAT SCREEN

Edward E. Johnson, St. Paul, Minn., assignor to Edward E. Johnson, Incorporated, St. Paul, Minn.

Original application November 10, 1934, Serial No. 752,383. Divided and this application December 28, 1935, Serial No. 56,494

5 Claims. (Cl. 209—393)

My invention relates to flat screens for uses such as de-watering coal after it has been washed, in ore separating machines and many like constructions.

It is a chief object of my invention to provide such a flat screen wherein the screening surface is provided by a series of flat-topped members of a relatively long wedge-shaped cross section having substantially acute-angled edges contacting with supporting members which likewise have reduced portions that come to substantially acute-angled edges, said sets of acute-angled edges contacting and being sunk predetermined distances one within the other to bring the flat surfaces of the first named members into a common plane and being metallically integrated and welded together at all crossing points.

It is a further object of my invention to provide such a screen with finishing members at the sides of the first named elements which will be integrally united therewith and parallel with the second named supporting elements and provided with side bounding walls whereby the length of the screen will run across said first named elements and across the slots between adjacent pairs thereof.

Such a screen will be particularly strong and rigid and will have exceptional screening capacity since the acute-angled unions of the surface and supporting elements practically eliminate any blocking action of the supporting elements. Furthermore, the slots between adjacent pairs of surface elements will be narrowest at the surface and will progressively widen inwardly through the screen so that said slots will be continuously self-cleaning and any substance that can pass through the surface openings will be readily passed out of the screen.

The process of fabricating such a flat screen is fully disclosed in my co-pending application, Serial Number 752,384, filed November 10, 1934, now Patent No. 2,046,461, issued July 7, 1936, and this application is a division of my application, Serial Number 752,383, filed November 10, 1934, now Patent 2,046,458, issued July 7, 1936.

The full objects and advantages of my invention will appear in connection with the detailed description thereof and its novel features are particularly pointed out in the claims.

In the drawing, illustrating an application of my invention in one form,—

Fig. 1 is a plan view of a flat screen embodying the features of my invention viewed from the back side. Fig. 2 is a sectional view taken on line 2—2 of Fig. 1. Fig. 3 is a part sectional view taken on line 3—3 of Fig. 1. Fig. 4 is an end elevation view of a semi-circular screen section from which the flat screen of Fig. 1 is developed. Fig. 5 is a fragmentary part sectional perspective view showing the shapes and manner of securing together of the surface-forming and supporting elements of the screen. Fig. 6 is a sectional view taken on line 6—6 of Fig. 1.

As clearly shown in Figs. 2 and 5, a multiplicity of transverse members 10 are roughly triangular in cross-section with flat tops of a deep triangular cross-section with substantially acute-angled edges 12. These several surface elements 10 are each applied to longitudinal supporting elements 13, and are integrated therewith by having their substantially acute-angled edges sunk into the acute-angled edges of the surface elements 10 predetermined distances so as to bring the flat surfaces 11 of such elements in a common plane with all of the elements separated uniform distances 14, all as clearly indicated in Fig. 6. The manner of integration of these parts is clearly shown at 15 in Figs. 2 and 5. The sinking together and integration is effected by a welding action whereby the elements 10 and 13 are not only sunk together exact predetermined distances to bring the surfaces 11 in a common plane, but the elements are integrated and welded together at every crossing point.

In practice this may be done by forming first a cylindrical screen with the above-described integral union and sinking together of elements 10 and 13 and then splitting the cylinder to produce a semi-cylindrical member such as shown in Fig. 4, and thereafter rolling this semi-cylinder flat, as appears in Figs. 1, 2 and 6. When so formed the transverse or surface-forming elements 10 will have ends 16 and 17 protruding beyond the outer supporting elements 13 which are designated in Figs. 1, 2 and 4 as 18 and 19.

To finish this screen and give it the requisite strength for the use to which it may be put, I provide side members 20 and 21, each of which is generally T-shaped in cross-section with a center flange 22 at right-angles to the body of the member 21 so as to provide oppositely-extending flanges 23 and 24 for the top and bottom of the screen respectively. The flange 22 is of a size such that when laid upon the inner edges of the end portions 16 or 17 of the surface elements 10 said flanges will engage the longitudinal supporting elements 18 and 19 respectively, as clearly shown in Fig. 2. These flanges 22 will be effectively and permanently secured to the end sections 16 and 17 of surface elements 10, pref-

erably by welding, or otherwise, as may be desired, and when so secured they will give the requisite longitudinal stiffness to the screen and at the same time afford side walls for retaining material being treated on the screens. It may be desirable in some forms of this screen to provide sloping side members **25**, as indicated in Fig. 2, to insure that all material passing down the screen shall be brought to travel over the screening surface thereof. Ears **26** are formed on the flanges **24** on the underside of the screen which are provided with apertures **27**, as clearly shown in Fig. 6, by which the screen is mounted upon any suitable supporting means whereby it may be given a desired shaking or vibrating movement where that is required.

The advantages of my flat screen will appear from the foregoing description. It will be apparent that a longitudinally-extended flat screen is provided of great strength and rigidity in proportion to its weight, having a flat screening surface with transverse slots extending from side to side thereof, said slots being narrowest at the surface and progressively expanding from the surface to the back of the screen. Material fed over the screen will have to travel across all these transverse slots and will be screened in a highly effective way thereby. Clogging of the screen will not take place, since anything which can pass into the slots will immediately pass on through because the slots progressively widen in cross-section from the surface. The screen, with these advantages, can be fabricated cheaply, so that it is available for use in industry at a moderate price.

I claim:

1. A flat screen comprising a multiplicity of longitudinally-extended supporting elements, and transverse surface-forming elements having flat tops and converging side walls meeting in a narrow edge portion, said surface-forming elements engaging said supporting elements with their narrowed edge portions away from said flat tops and being welded together at each crossing point and sunk one within the other predetermined equal distances to bring said flat tops in a common plane with the edges thereof spaced suitable distances to form a series of uniform transverse drainage slots all diverging away from said common plane.

2. A flat screen comprising a multiplicity of longitudinally-extended supporting elements, transverse surface-forming elements having flat tops and narrowed edge portions, said surface-forming elements engaging with said edge portions said supporting elements away from said flat tops and being welded together at each crossing point and sunk one within the other predetermined equal distances to bring said flat tops in a common plane with the edges thereof spaced suitable distances to form a series of uniform transverse drainage slots, and stiffening members secured to ends of the transverse members protruding beyond the respective outside supporting elements.

3. A flat screen comprising a multiplicity of longitudinally-extended supporting elements, transverse surface-forming elements having flat tops and narrowed edge portion, said surface-forming elements engaging with said edge portions said supporting elements away from said flat tops and being welded together at each crossing point and sunk one within the other predetermined equal distances to bring said flat tops in a common plane with the edges thereof spaced suitable distances to form a series of uniform transverse drainage slots, and flanged members for forming longitudinal side walls above the plane of said tops secured to end portions of said surface-forming elements protruding beyond the respective outside supporting elements.

4. A flat screen comprising a multiplicity of longitudinally-extended supporting elements, transverse surface-forming elements having flat tops and narrowed edge portion, said surface-forming elements engaging with said edge portions said supporting elements away from said flat tops and being welded together at each crossing point and sunk one within the other predetermined equal distances to bring said flat tops in a common plane with the edges thereof spaced suitable distances to form a series of uniform transverse drainage slots, stiffening members secured to ends of the transverse members protruding beyond the respective outside supporting elements, and attaching means for the screen formed on said stiffening members.

5. A flat screen comprising a multiplicity of longitudinally-extended supporting elements, each formed with an acute-angled edge, and transverse surface-forming elements each having flat tops and a substantially acute-angled edge, said sets of elements crossing each other angularly with their acute-angled edges welded together at each crossing point and sunk one within the other predetermined equal distances to bring said flat tops in a common plane with the edges thereof spaced suitable distances to form a series of uniform transverse drainage slots.

EDWARD E. JOHNSON.