

Nov. 1, 1932.

J. A. FLINT

1,886,173

SCREEN

Filed Jan. 9, 1928

2 Sheets-Sheet 1

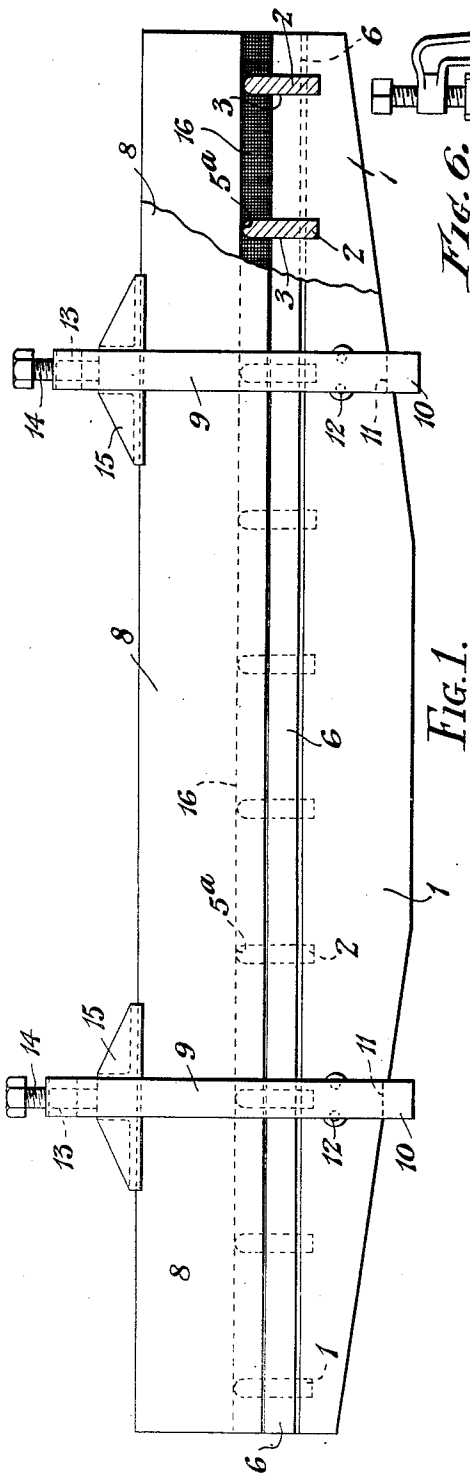


Fig. 1.

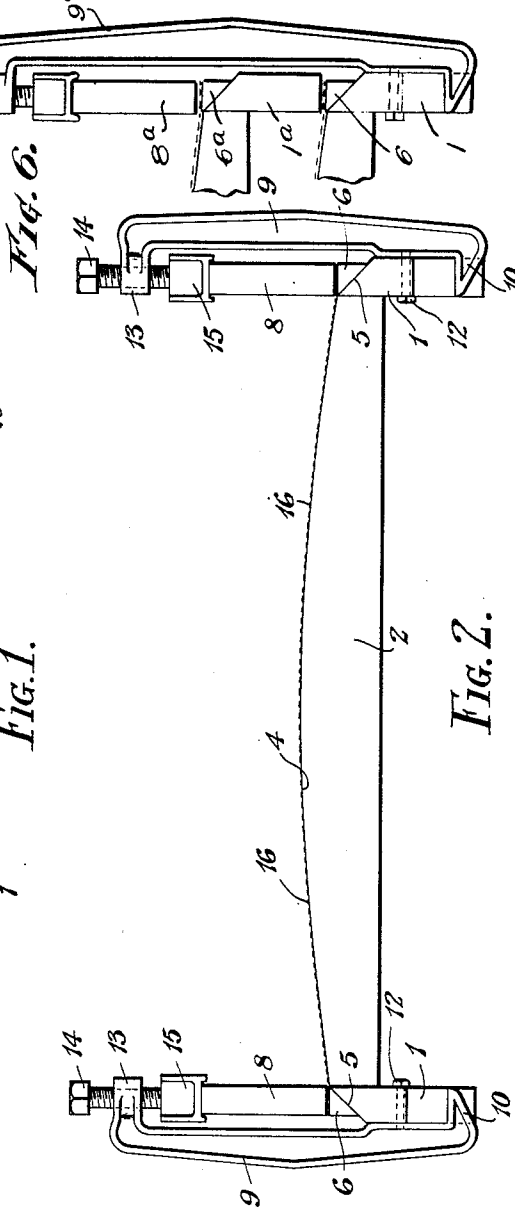


Fig. 2.

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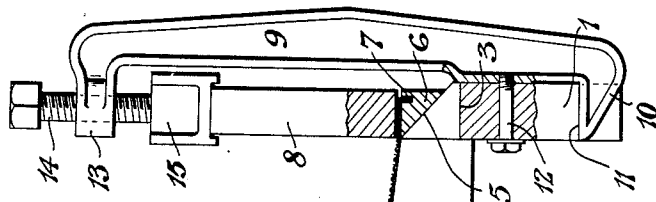


Fig. 3.

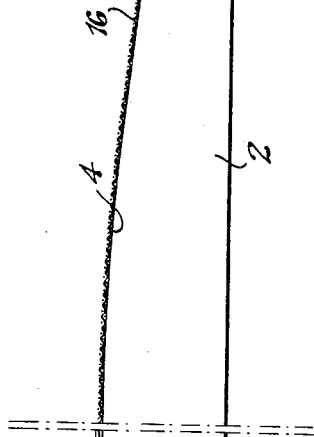


Fig. 4.

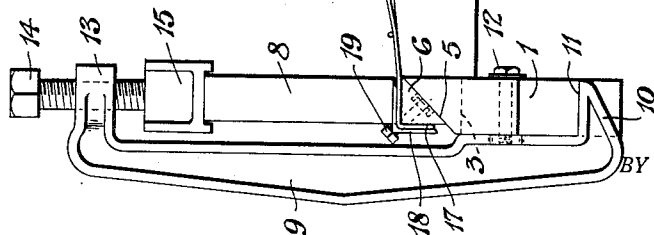


Fig. 5.

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## UNITED STATES PATENT OFFICE

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## SCREEN

Application filed January 9, 1928. Serial No. 245,298.

This invention relates to screens for use in connection with screening apparatus in which the screen is vibrated at a high frequency for the purpose of screening or separating materials placed thereon or fed thereover.

The screen forming the subject matter of this invention is particularly adapted for use in connection with electro-magnetic vibratable screening apparatus, in which the screen is vibrated by means of an electric reciprocating motor or motors, to the reciprocating or vibrating element or elements of which the screen is attached, and by which it is vibrated at a high frequency.

It has been found difficult to obtain proper vibration and operation of the screen if there is any material slackness in the screen cloth or screen wire mounted on the screen frame or sash, as the weight or inertia of the screen cloth or wire causes it to leave the frame or sash momentarily at the end of the upward movement thereof, and the wire or cloth then springs back against the sash, giving an undesirable flapping action which disturbs the true or proper vibration and results in a wearing out of the screen cloth or wire more quickly than it should do.

The object of the invention is to provide an improved construction of screen whereby the screen cloth or wire is securely and tightly held down upon the screen sash or frame, so that such screen cloth or wire will vibrate exactly with the sash or frame, thereby providing for a true and proper vibration of the screen as a whole, and avoiding undesirably rapid wear of the screen cloth or wire.

The invention is illustrated in different forms thereof in the accompanying drawings, in which:

Figure 1 is a side elevation, partly in section, of one form of screen constructed in accordance with the present invention;

Figure 2 is an end elevation of the screen shown in Figure 1;

Figure 3 is a somewhat enlarged end elevation, with parts in section, of one-half of the screen as shown in Figures 1 and 2, and adapted for use where the screen cloth is of fine mesh;

Figure 4 is an enlarged end elevation of one-half of a screen similar to that shown in Figures 1 and 2, the construction being modified somewhat for use where the screen wire is of large mesh;

Figure 5 is an end elevation of a modified form of the screen frame or sash; and

Figure 6 is a detailed view showing the application of the invention to a double deck screen.

Referring firstly to the construction shown in Figures 1, 2 and 3, the screen frame or sash shown therein comprises two parallel side members 1, which are connected together by means of a plurality of parallel cross ribs 2, the ends of the cross ribs being dovetailed into suitable slots 3 formed in the upper edges of the side frame members, and suitably secured in such slots, as by gluing and fastening with wood screws and dowel pins.

It is usual in making such screen frames or sash, to make the upper edges of the cross ribs straight or horizontal from one side member to the other, and to mount the screen cloth or wire so that it rests upon the horizontal upper surfaces of the cross ribs. This has been found to be undesirable for the reason above indicated that the screen cloth or wire tends during vibration of the sash or frame to move away from the cross ribs and to fly back into engagement therewith, producing a flapping action which interferes with the proper vibration and causes rapid wearing out of the screen cloth or wire.

To avoid this disadvantage, the upper surfaces of the cross ribs are arched, cambered, or curved, as shown at 4 in Figures 2 and 3,

and the screen wire or cloth is stretched tightly over and down upon the arched or cambered surface produced in effect by the upper surfaces of the plurality of cross ribs. The upper surfaces of the cross ribs are preferably rounded in cross section as shown at 5 in Figure 1.

Improved means are provided for effecting the stretching or tightening of the screen cloth or wire transversely of the frame or sash over the arched or cambered upper surfaces of the cross ribs 2. The upper edges of the side frame members 1 are cut away or bevelled to provide downwardly and outwardly inclined surfaces 5 as shown clearly in Figures 2 and 3. Bars or strips 6, preferably co-extensive in length with the side members 1 are provided, these bars or strips having the lower surfaces thereof inclined or bevelled to mate or coact with the inclined or bevelled upper surfaces 5 of the side members. Preferably the bars or strips are of triangular cross section as shown, and they are made somewhat narrower than the side members to provide some allowance for different amounts of stretch in the various sizes of screen cloth, as well as for variation in cutting the width of the cloth.

When fine mesh screen cloth is to be used on the screen, a narrow slot 7 is cut or rabbeted out at the upper side of each bar or strip 6, and the edge of the screen cloth is inserted in this slot as shown in Figure 3. Above the bars or strips 6 are provided side boards 8, which are of approximately the same length as the bars or strips, and may be of substantially the same thickness. These side boards act primarily as bearing members upon the side edges of the screen cloth and the bars or strips 6, to transmit pressure thereto, but they also serve as guards to keep the ore or other material being treated, on the screen cloth.

The means for applying pressure to the side boards 8 and bars 6, comprises a suitable number of clamps 9, for example, two of such clamps at each side of the screen frame. Each of these clamps is provided with an inwardly extending foot 10 which engages beneath the lower edge of one of the side members 1, such edge preferably being notched as indicated at 11, Figure 1, to provide a proper bearing for the foot of the clamp. Preferably also the clamps are attached to the side members 1, as by means of bolts 12, passing through such side members and threaded into the clamps. These bolts are not intended to take any strain but simply to hold the clamps in place on the screen frame when the screen cloth is being changed. The heads 13 of the clamps are provided with threaded apertures in which are arranged relatively large screws 14, which at their lower ends bear against shoes 15

which rest upon the upper edges of the side boards 8.

It will be seen that with the feet 10 of the clamps bearing upwardly against the lower edges of the side members 1, by adjusting the screws 14 downwardly against the shoes 15, pressure will be transmitted downwardly through these shoes and through the side boards 8, to the side edges of the screen cloth and to the bars or strips 6. As the bars or strips rest with their bevelled or inclined surfaces upon the upper bevelled or inclined surfaces of the side members 1, the transmission of the pressure to the bars or strips will result in the forcing of these strips downwardly and outwardly upon the inclined surfaces 5, the two bars or strips moving away from each other transversely of the screen frame. As the side edges of the screen cloth are held securely down on to the bars or strips 6 and within the slots 7 thereof by the side boards 8, the movement of the bars or strips away from each other will result in the transverse stretching or tightening of the screen cloth 16, and such screen cloth will be held tightly down upon the arched or cambered upper surfaces 4 of the cross ribs 2.

It will be understood that the clamps are so positioned, and the shoes 15 are of such length that through the medium of the side boards 8 the pressure will be transmitted uniformly to the edges of the screen cloth and to the bars or strips 6, and that the screen cloth is thereby stretched over the cross ribs 2 uniformly throughout its entire area.

In cases where the screen wire is of large or coarse mesh, it is preferred to use the modified arrangement of bar or strip shown in Figure 4. In this form the side edges of the wire mesh 17 are bent down around the outer side of the triangular bar or strip 6 and an angle iron member 18 is employed to hold the wire mesh securely to the bar or strip. This angle iron member is substantially co-extensive in length with the bar or strip and the member and bar are formed at intervals throughout the lengths thereof with diagonally extending holes to receive securing or clamping bolts 19. The side boards 8 in this form bear upon the upper surfaces of the angle members 18. The construction and operation are otherwise the same as described with reference to Figures 1 to 3.

Figure 5 illustrates a modified construction of the screen frame or sash. This construction comprises side members 1 similar to those previously described, and cross ribs 20 extending between and connected with the side members in a similar manner to that described with reference to the cross ribs 2 of Figures 1 to 3. The upper surfaces of these cross ribs, however, are straight or horizontal, and the cross ribs are each provided with a plurality of notches 21 in the upper part thereof. In the notches of the cross ribs are

positioned and suitably secured a plurality of longitudinally extending ribs 22. These longitudinal ribs are of varying heights inwardly from the side edges toward the center of the screen frame, although each rib is of the same height throughout its length. These longitudinal ribs of varying height constitute in effect an arched or cambered supporting means for the screen cloth or wire. It will be understood that the screen frame or sash is provided with similar stretching or tightening means to that described in connection with the preceding modifications, and that when such stretching or tightening means is operated, the screen cloth or wire will be stretched tightly over and down upon the upper surfaces of the ribs 22 and will assume the arched or cambered condition indicated by the dotted line 23.

It will be understood from what has been said that a simple and effective stretching or tightening means has been provided for stretching or tightening the screen cloth or wire upon the screen frame or sash, and that due to the provision of the arched or cambered supporting means upon which the screen cloth or wire is stretched, the screen cloth or wire will at all times be held tightly down against the sash and will vibrate exactly as a unit with the sash during vibratory movement of the latter.

It will be understood that the screen frame or sash is mounted in the screening apparatus so that vibratory movement will be imparted thereto to effect the screening or separation of the materials placed upon or fed over the screen cloth. For example, the side members of the sash may be secured, as by means of through bolts, to the reciprocating or vibratory elements of electromagnetic reciprocating or vibrating motors. With the screen cloth or wire stretched and supported in the condition before described there will be no tendency for the cloth or wire to leave the supporting ribs of the screen frame as in the known forms of screen frame or sash, but the cloth or wire will always be held in close engagement with the supporting ribs whereby the undesirable flapping action previously mentioned will be avoided and the screen cloth or wire will have materially longer life as well as providing for a more effective screening or separation of the materials.

The invention may be readily applied to multiple or double deck screens, for example, as shown in Figure 6, in which the side members 1a of an upper frame or sash coact with the bars or strips 6 of a lower sash in the same manner as the sideboards 8 cooperate with such bars or strips in the single deck screen previously described. The sideboards 8a are then arranged in coacting relation with the bars or strips 6a of the upper screen frame or sash and the clamps 9a are made longer

to accommodate the plurality of screen frames.

What I claim and desire to secure by Letters Patent is:—

1. In a screening device, a supporting frame including side members, a screening element disposed across said side members, there being a downwardly and outwardly disposed surface on at least one of said side members, a bar to which one edge of the screening element is secured, there being a downwardly and outwardly disposed surface on said bar and coacting with the surface on the side member, and means for exerting substantially vertical pressure on said bar adapted to cause relative movement between said surfaces to force the bar outwardly.

2. In a screening device, a supporting frame including side members, a screen disposed across said side members, there being an inclined surface at an angle to the screen surface on at least one of said side members, a bar to which one edge of the screen is secured, there being an inclined surface on said bar coacting with the inclined surface on the side member, and means for exerting substantially vertical pressure on said bar adapted to cause relative movement between said inclined surfaces to force the bar outwardly.

3. In a screening device, a supporting frame including side members, a screen disposed across said side members, there being an inclined surface at an angle to the screen surface on at least one of said side members, a bar to which one edge of the screen is secured, there being an inclined surface on said bar coacting with the inclined surface on the side member, a board member substantially coextensive in length with said bar and coacting therewith and means for exerting substantially vertical pressure on said board member adapted to cause relative movement between said inclined surfaces to force the bar outwardly.

4. In a screening device, a supporting frame including side members, a screen disposed across said side members, there being an inclined surface at an angle to the screen surface on at least one of said side members, a bar to which one edge of the screen is secured, there being an inclined surface on said bar coacting with the inclined surface on the side member, and screw clamps coacting with said side member and said bar and operative to exert substantially vertical pressure on said bar adapted to cause relative movement between said inclined surfaces to force the bar outwardly.

5. In a screening device, a supporting frame including side members, a screen disposed across said side members, there being an inclined surface at an angle to the screen surface on at least one of said side members, a bar to which one edge of the screen is se-

cured, there being an inclined surface on said bar coacting with the inclined surface on the side member, a board member substantially coextensive in length with said bar and co-  
8 acting therewith, shoes engaging the side of said board member opposite to said bar and screw clamps coacting between said side member and said shoes and operative to ap-  
ply substantially vertical pressure on said  
10 bar adapted to cause relative movement between said inclined surfaces to force the bar outwardly.

In testimony whereof I affix my signature.  
JAMES A. FLINT.

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