

(No Model.)

G. W. CROSS.
SCREEN.

No. 572,697.

Patented Dec. 8, 1896.

Fig. 1

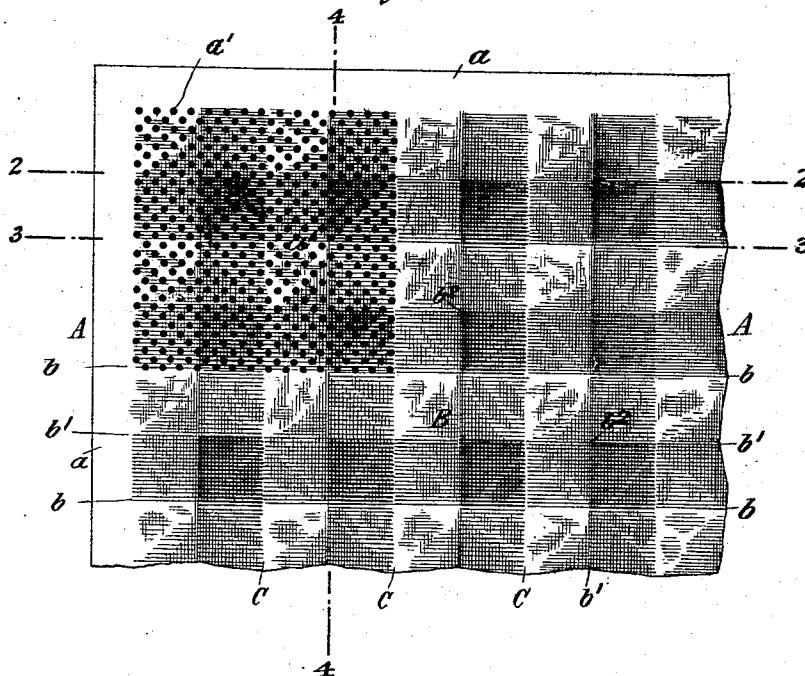


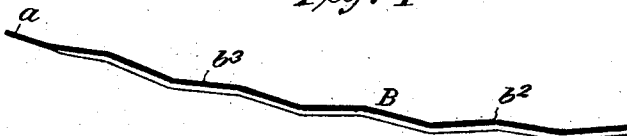
Fig. 2



Fig. 3



Fig. 4



Witnesses:
Norris H. Clark.
John P. Taylor.

George W. Cross
Inventor
by Dyer & Driscoll
His Attorneys

UNITED STATES PATENT OFFICE.

GEORGE W. CROSS, OF PITTSBURGH, PENNSYLVANIA.

SCREEN.

SPECIFICATION forming part of Letters Patent No. 572,697, dated December 8, 1896.

Application filed January 13, 1896. Serial No. 575,242. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. CROSS, a citizen of the United States, residing at Pittston, in the county of Luzerne and State of Pennsylvania, have invented a certain new and useful Improvement in Screens, of which the following is a specification.

This invention relates to improvements in screens for the separation of coal and similar materials into various sizes.

While the invention is capable of application to both plane and revoluble screens, I contemplate using it more largely in the latter connection, and shall therefore describe herein an embodiment of the construction having that use in view. Again, it is my present belief that the invention will find its greatest commercial utility in connection with the separation of the finer sizes of material, for which purpose is employed a screening-surface provided with fine perforations.

The invention consists, essentially, of a perforated screen having upon its working surface peculiar curvatures, to the end that the material upon said surface may be agitated and distributed thereon in such manner as to promote and facilitate the screening operation.

I am aware that screen-surfaces have been devised in which the working face has been provided with curvatures out of its plane. These may be roughly classified as, first, those in which each web or certain of the webs bounding the interstices are curved or bent out of the plane of the working surface, and, second, those in which portions of the working surface comprising many webs are bent or curved out of the said working surface.

The present invention concerns particularly the latter class of screen surfaces, in that it contemplates bending or curving portions of the surface comprising a number of webs in contradistinction to bending or curving each web.

In carrying out the invention I preferably construct the screen-surface of sheet-steel plates in the form of segments of a circle, each segment being provided with perforations of any desired size and shape. At predetermined intervals the working surface of the segment is pressed or bent upwardly or above the plane of such surface in parallel

rows, the highest point of the elevations being preferably about midway between the lines bounding said elevations or upwardly-bent portions. The plate having these rows of parallel elevations is then, at predetermined intervals, depressed in lines running at approximately a right angle to the rows of elevations, the lines of depression being wavy and (when the straight margins of the plate are in a horizontal plane) their highest points being adjacent to the highest points of the elevations. The elevations thus formed are pyramidal in form, there being preferably, however, no sharp angles and the entire surface of the plate, both the elevations and the depressions, being perforated. The effect of this construction is to agitate and distribute upon the working surface of the screen the material being operated upon, permitting such particles as are small enough to pass through the perforations to do so and precluding their sliding in the bottom of the screen in such manner as to pass over the perforations, thus obtaining economy of screen-surface and rapid and accurate separation.

In the drawings, Figure 1 is a plan view of a plate or segment embodying my invention. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a section on the line 3 3 of Fig. 1, and Fig. 4 is a section on the line 4 4 of Fig. 1.

Referring to the drawings, in which similar letters of reference denote corresponding parts, A designates the screening-surface, (here shown in the form of a rectangular plate of sheet-steel bounded by integral imperforate margins *a*.) The segment A is provided with perforations *a'* (shown only in Fig. 1) of any desired size, shape, and relative arrangement.

For convenience I shall in describing the drawings refer to the direction from right to left in Fig. 1 as the "longitude" of the segment the direction at right angles thereto being termed "transverse."

B designates pyramidal elevations formed in the perforate surface of the segment between the margins *a*. In forming these elevations I have found it economical to bend the working surface upwardly from the under side of the plate between the lines *b b*, both the lines *b b* and the lines *b'* (the latter passing through and indicating the apices *b''*

of the elevations) being, however, of curved or rounding contour and the major part b^3 of the working surface between the lines b' and the lines b being preferably approximately straight. The elevations B at this stage of the preferred method of construction have somewhat the form of continuous raised ribs extending continuously from one margin to the opposite margin. The working surface is then depressed along the transverse lines C, and said lines may, if desired, be the same distance apart as are the lines $b b$, thereby making the base of each pyramid square.

The transverse lines of depression C are preferably wavy or undulating in form, their highest points being adjacent to but below the highest points of the elevations B, and being therefore at the points of intersection of the lines C with the lines b' . The lowest points of the lines C are at the points of intersection with the lines b . Thus in the embodiment of the invention shown in the drawings the entire working surface of the screen (or of the screen-segment between its margins) is provided with the elevations or bosses B, and these are preferably disposed in rows both longitudinally and transversely. As shown, each elevation comprises a rounded apex b^3 , having rounded or curved base-lines b' and C and approximately straight sides b^3 .

In practice the coal or other material is fed upon the screen-surface, and by reason of the construction described is kept during the screening operation in a continual state of agitation. The elevations separate and distribute the material over the perforated surface, prevent it from sliding, and aid in directing the smaller particles to the perforations through which they should pass.

It is not intended herein to limit the invention to the method of construction described,

that having been referred to merely as a convenient and economical means of producing the improved structure. It should further be understood that the invention is not limited to the form of screen-segments, for it may be advantageously employed in a continuous cylindrical screen-surface or "jacket." Again, it may be employed in plane screens as well as in revoluble screens and in materials other than steel, such as cast-iron, woven wire, &c.

I claim—

1. A screen-surface provided with separated, integral, perforated elevations having rounded apices, substantially pyramidal in form as set forth.

2. A screen-surface provided with separated, integral, numerously-perforated elevations having rounded apices and approximately straight sides converging toward said apices, substantially as set forth.

3. A screen-surface having perforations therein and struck up between two substantially parallel lines, and between two other substantially parallel lines crossing the first-mentioned lines, whereby a series of separate, adjacent, integral perforated elevations is produced, substantially as set forth.

4. A screen-surface having perforations therein and struck up in the form of two series of substantially parallel ridges, crossing one another, whereby separate, adjacent, integral perforated elevations are produced occupying substantially the entire surface of the screen-surface, substantially as set forth.

This specification signed and witnessed this 8th day of January, 1896.

GEORGE W. CROSS.

Witnesses:

S. O. EDMONDS,
JOHN R. TAYLOR.