

(No Model.)

G. W. CROSS.  
SCREEN.

No. 545,056.

Patented Aug. 27, 1895.

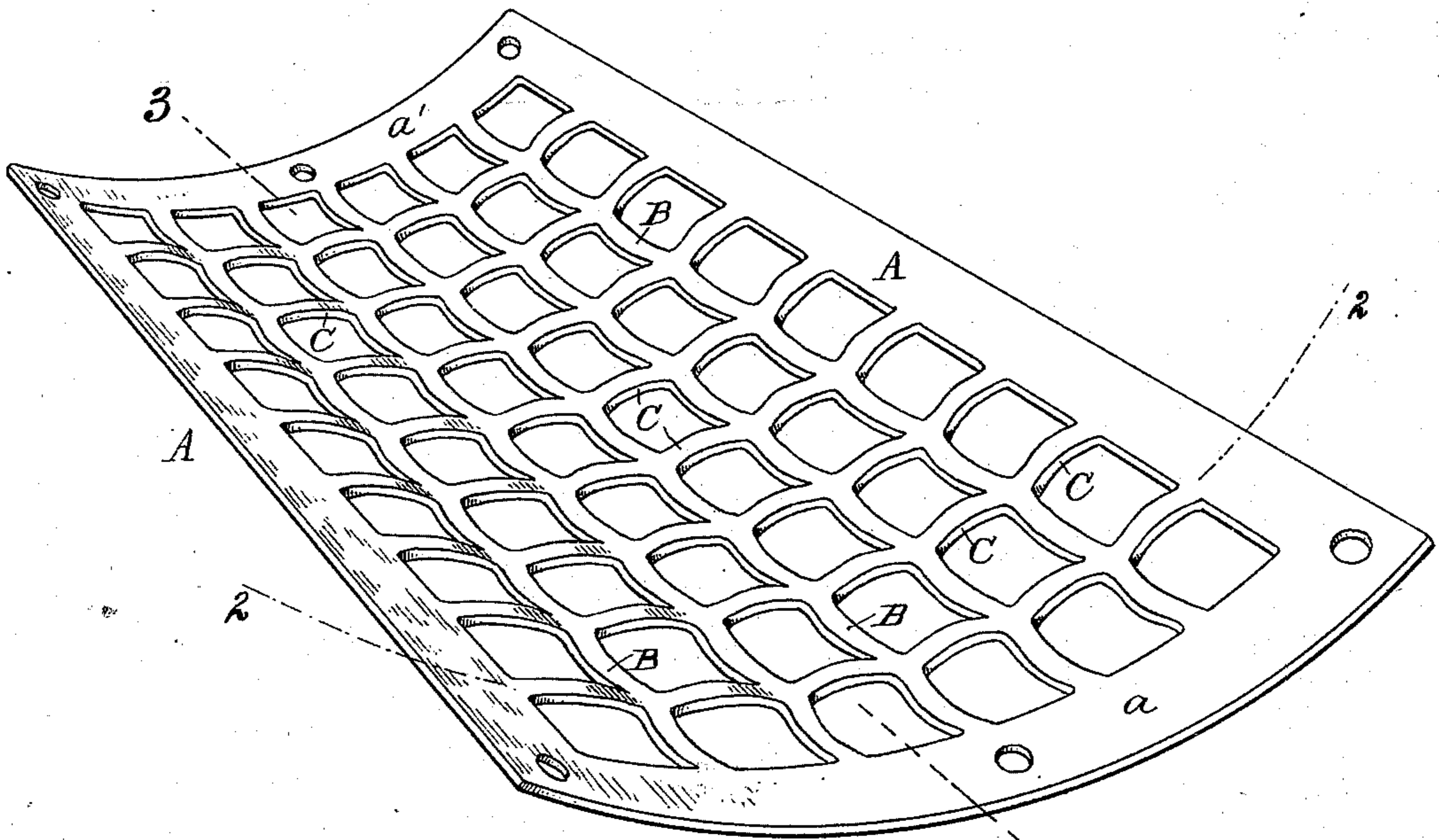


Fig. 1.

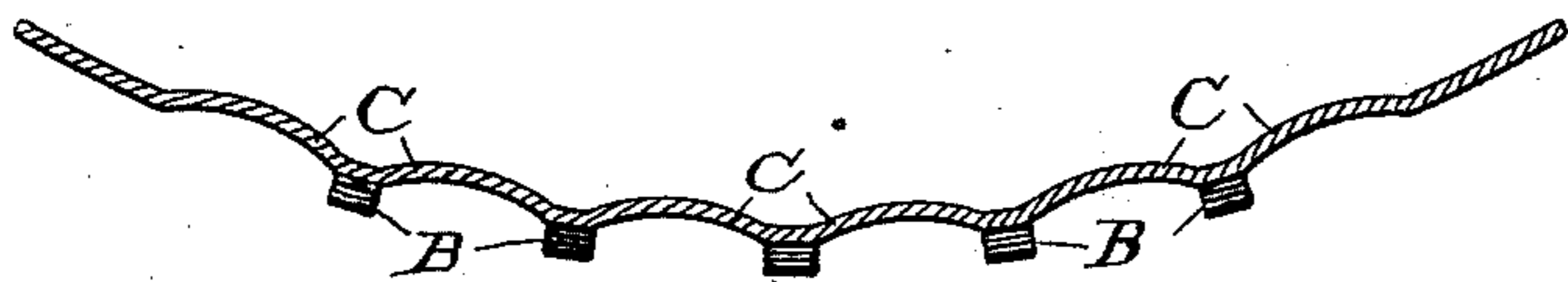
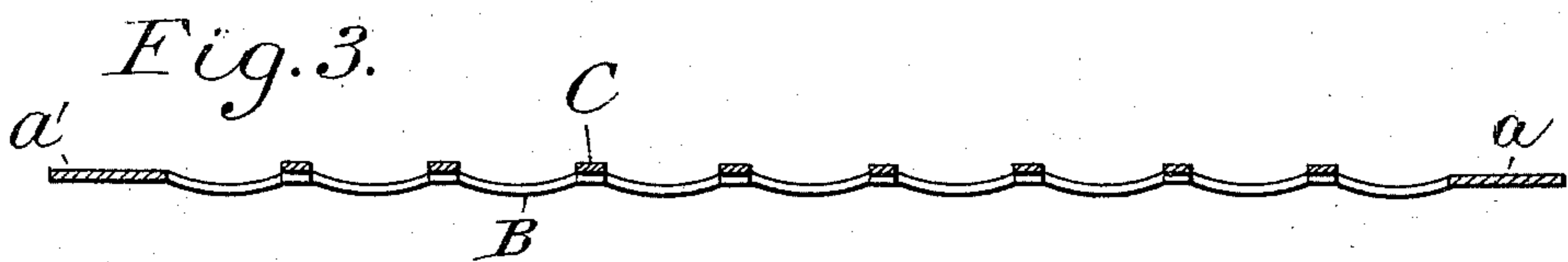


Fig. 2.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE W. CROSS, OF PITTSBURGH, PENNSYLVANIA.

## SCREEN.

SPECIFICATION forming part of Letters Patent No. 545,056, dated August 27, 1895.

Application filed December 8, 1894. Serial No. 531,189. (No model.)

*To all whom it may concern:*

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

This invention relates to screening-surfaces for the separation of particles of coal, ore, stone, and similar material into various sizes. As is well known, in the preparation of coal for the market the material, after being crushed, is brought to the screens for the purpose of being "sized," these screens being usually cylindrical in form and provided, preferably, with rectangular interstices increasing in size from the inlet to the outlet end of the screen. In these screens means are usually employed for tumbling or agitating the coal in its passage over the screening-surface in order to facilitate the screening operation. I have found it very desirable for this purpose to provide the webs bounding the interstices in the screening-surface with certain curvatures, which serve to roughen said surface and thereby agitate the material and to carry a part of said material up a portion of the way from the bottom of the cylindrical surface. In my patent, No. 513,890, dated January 30, 1894, is illustrated a screening-surface similar in nature to the form heretofore described. In that surface the longitudinal webs—that is to say, the webs extending in the direction of the longitude of the screen-segment—are convex relatively to the working-face, while the transverse webs are concave.

The present invention is directed more particularly to the separation of the larger sizes of coal, where the same degree of tumbling and the same operation of partially carrying the material up the side of the screen are customarily not required. It will be understood that where the material is carried well up the side of the screen more screening-surface is required than would be the case could such material be sufficiently agitated as to properly facilitate the screening without such operation. Again, in the preparation of soft or bituminous coal the effect of many existing devices for tumbling or agitating is to more or less disintegrate the material, and much of

the coal is lost through being passed out of the screen in the form of culm or refuse.

To the end that the objections above described may be obviated I have found it desirable to provide the webs between the interstices with certain peculiar curvatures, as will be hereinafter fully described.

In the drawings, Figure 1 is a perspective view illustrating a screen-segment having a surface embodying the present invention. Fig. 2 is a section on the line 2 2 of Fig. 1; and Fig. 3 is a section on the line 3 3 of Fig. 1, that portion of the screen-surface beyond the row of interstices through which the section is taken being omitted.

Referring to the drawings, in which similar letters of reference denote corresponding parts, A designates a screen-segment, preferably of steel plate, and provided in this instance with a curvature on the arc of a circle the center of which is the center of the cylindrical screen upon which said segment is designed to be placed. The segment is provided on all four sides with imperforate margins, and the end margins *a a'* are preferably provided with perforations for the reception of bolts, by means of which the segments may be secured upon the spider-bands of the screens.

B designates the longitudinal webs, and C the transverse webs bounding the rectangular interstices in the screen. As shown, the longitudinal webs B are bowed or curved outwardly from the working face—that is to say, they are made concave relatively to said face—while the transverse webs are bowed or curved inwardly or, in other words, are made convex relatively to the working face of the screen. Inasmuch as in the present instance the interstices are arranged in rows which are in line both longitudinally and laterally, the transverse webs will be practically continuous from one side of the segment to the other, and the many convexities in each such transverse web make it sinuous in form.

In operation the screen is preferably mounted at an angle, the material to be separated being introduced at the higher end. Such material will, owing to the motion and pitch of the screen, be agitated and retarded in its flow by means of the transverse convexities. It is desirable that the screening operation should take place as soon as the particles

reach the point upon the surface where the perforations are of the proper size to permit their passage therethrough. As the material passes over the plate each particle moving upon the surface will be retarded and turned over, owing to the curvature of the web C out of the working surface. As each particle is turned over or retarded it is, if of the proper size to pass through the perforation one side of which is bounded by the web C, caused to drop directly therethrough or deflected so as to fall upon the concavity B, whence, by reason of the rotation of the screen, it is allowed to fall through the perforation. By means of this construction, as will be readily understood, the coal will not, to any appreciable extent, be carried around the side of the screen, but, by means of the convex transverse webs, will be sufficiently tumbled while in the bottom of the screen to facilitate the sizing operation, and in addition said convex webs retard the passage of the coal through the screen, so that the various sizes are separated within a smaller space. In other words, the same results as are now accomplished by a screen of a certain size may, with the present improvement, be accomplished by a screen much smaller.

It should be understood that while referring to the webs B and C as longitudinal and transverse I have had in mind the employment of the improvement on an oblong screen-segment such as that illustrated in the drawings, in which the longitude of the segment is the lon-

gitude of the whole screen. It is apparent, however, that the improvement is equally applicable to screens composed of segments of different dimensions as well as to screens employing a continuous circular jacket.

I claim—

1. A screening surface having rectangular interstices bounded by longitudinal and transverse webs, said transverse webs being continuous and sinuous in form, and each convex portion of said transverse webs being located between two adjacent interstices, substantially as described.

2. A screening surface provided with rectangular interstices, the longitudinal webs between such interstices being concave and the transverse webs being sinuous or undulatory, the convexities of said transverse webs being located between two adjacent interstices, substantially as described.

3. A screen segment having imperforate margins, the interstices in said segment being bounded by longitudinal and transverse webs, the former being concave between the interstices and the latter being continuous and undulatory between said margins, and the convexities thereof being located between two adjacent interstices, substantially as described.

This specification signed and witnessed this 30th day of November, 1894.

GEORGE W. CROSS.

Witnesses:

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