(No Model.)

G. W. CROSS.

SCREEN.

No. 583,032. Patented May 25, 1897.

Fig. 1.

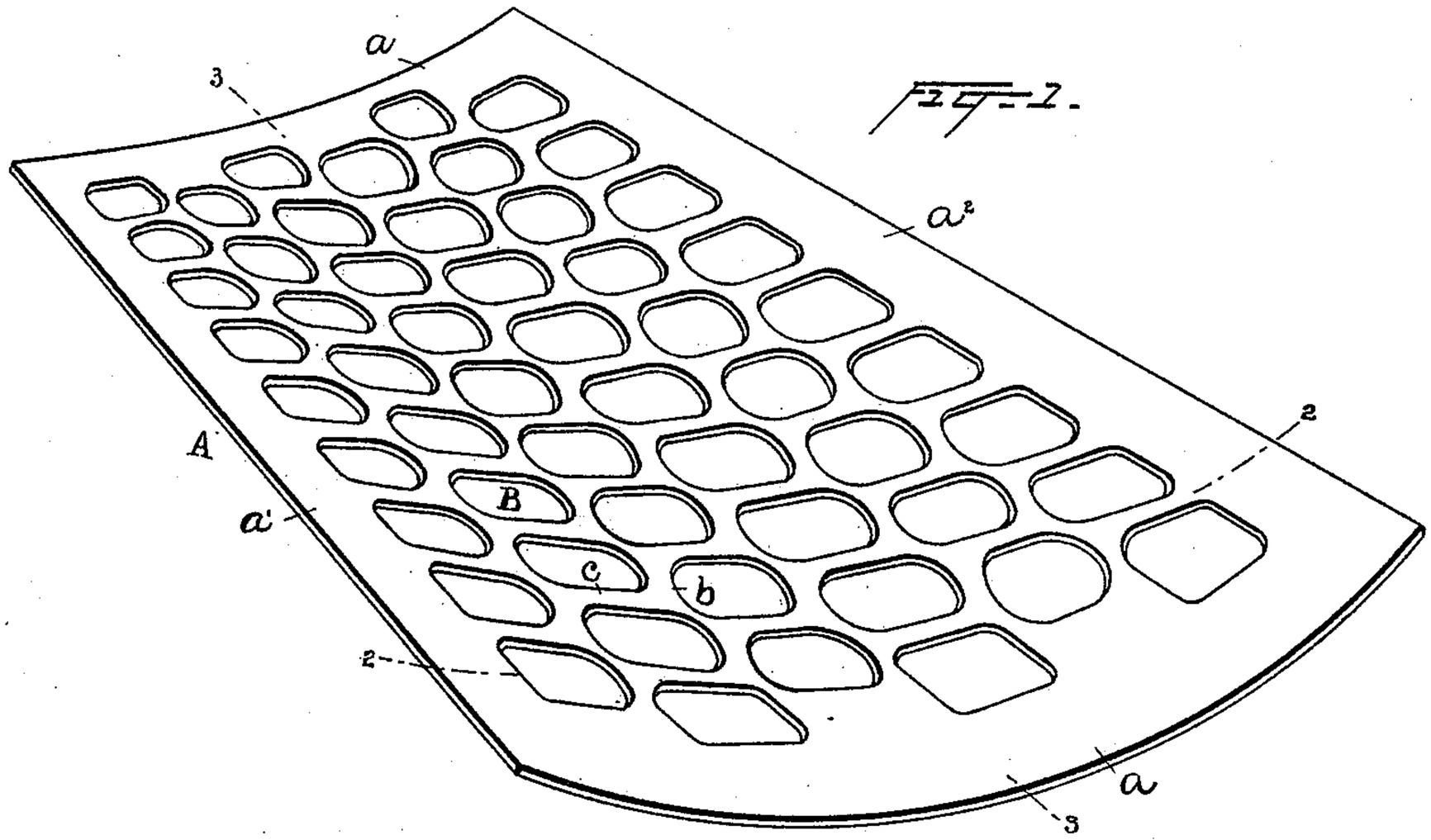


Fig. 2.

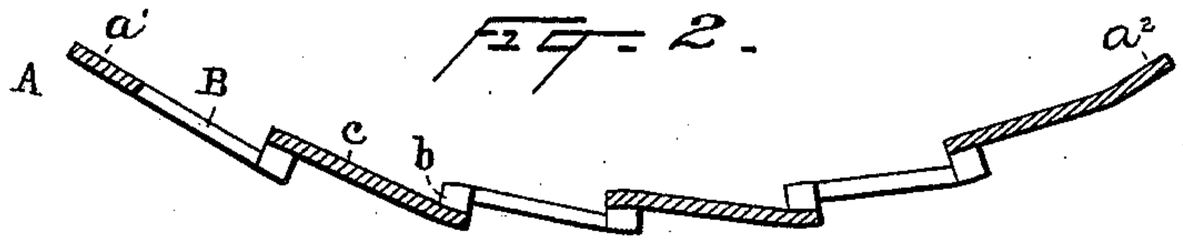


Fig. 3.

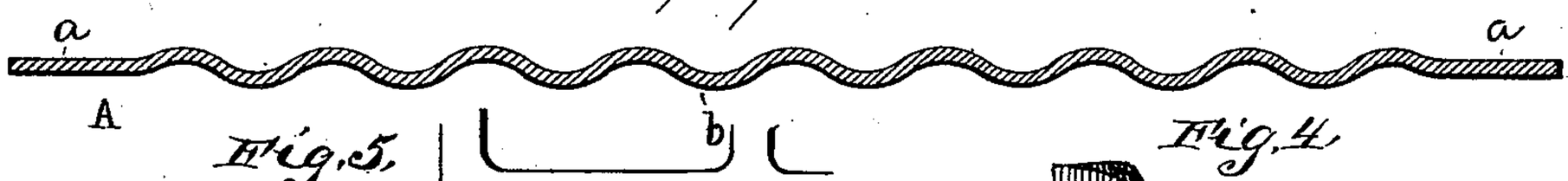


Fig. 5.

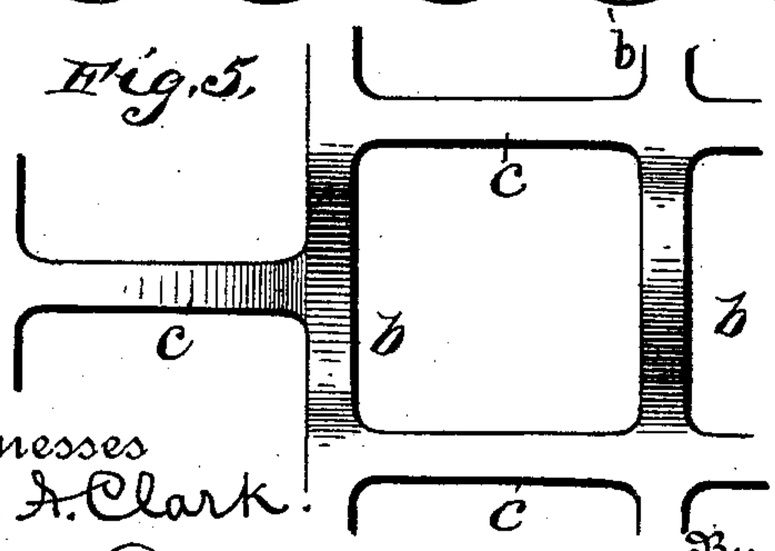
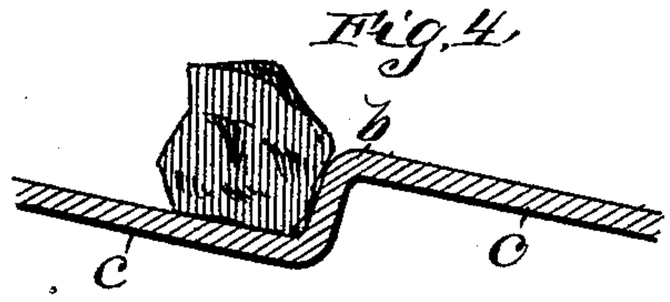


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE W. CROSS, OF PITTSTON, PENNSYLVANIA.

SCREEN.

SPECIFICATION forming part of Letters Patent No. 583,032, dated May 25, 1897.

Application filed October 1, 1896. Serial No. 607,550. (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 screens for the separation of coal and similar materials into the various sizes. It concerns particularly that type of screening-surfaces in which the webs or bars bounding the interstices are curved or "crimped" out of the plane of the working face. An example of this type is shown in Letters Patent No. 523,515, granted to me on July 24, 1894. In screens of the type described two important considerations obtain. First, the surface must be so crimped as to provide the maximum amount of strength or resistance to the wearing and distorting effect of the material being screened, and, second, provision must be made for facilitating the screening operation—that is to say, the particles of material must be so treated as to readily find the mesh and pass through the interstices therein. In the present invention both of these main requirements are met, the result being a screening-surface of great strength, durability, and efficiency.

In carrying out the invention I employ an integral metallic plate provided with substantially rectangular interstices, the latter being staggered in their arrangement—that is to say, each transverse web between the interstices of one longitudinal row being opposite an interstice in the next adjacent rows. The longitudinal webs, which extend continuously from end to end of the plate, are undulatory in form, each convexity in one web being opposite a concavity in the two adjacent webs. The transverse webs, which are separated owing to the staggered relation of the interstices and which join the continuous longitudinal webs, extend from the convexity of one of the latter to the concavity of the next adjacent longitudinal web. These transverse webs are therefore inclined at an angle relatively to the plane of the plate and, what is more important, are not curved, but are straight from end to end. The first advantage obtained by this construction is maximum strength. The primary object of all crimping is the agitating or tumbling of the material in its passage through the screen. This action is obtained by moving the particles relatively to each other by means of the curved webs. It is the occasion of much destructive wear upon the screen-surface, especially such surfaces as are designed for the separation of coal and stone, which are frequently called upon to separate a continuous and heavy mass of material. In the construction above described that portion of the material next adjacent to the screen-surface is guided into the interstices by the downwardly-inclined transverse web-bars, the lower ends of which join the continuous longitudinal bars at the lowest point of the latter. On the opposite side of the perforations the particles strike the convexities of the longitudinal webs and are thereby interrupted and guided into the perforations bounded by those webs. The force of the blow is not borne wholly by the convexities referred to, as these are strengthened by the inclined transverse webs behind them and which support and sustain the longitudinal webs to which they are joined at the highest points of convexity of the latter. In this manner the destructive feature of the agitating or tumbling operation is minimized. Another and equally important advantage is the increased efficiency of the surface due to the fact that the particles of material are guided to each interstice by means of the downwardly-inclined transverse web-bars, which form in effect grooves terminating with the interstices. In addition to this the opposite side of each interstice to which particles have been guided being above the plane at which the coal passes over the surface interrupts its passage, and if the particles are of the proper size assures their passage through such interstices.

In the drawings, Figure 1 is a perspective view of a screen-segment employing my invention. Fig. 2 is a transverse section on the line 2 2, Fig. 1. Fig. 3 is a longitudinal section on the line 3 3, Fig. 1. Fig. 4 is an enlarged sectional view on the line 4 4, Fig. 1; and Fig. 5 is an enlarged view in plan of a portion of the mesh or screening-surface of the segment shown in Fig. 1.

The invention has been illustrated as embodied in a screen plate or segment forming part of the jacket of a revolving screen. It is to be understood, however, that the improved construction may with advantage be employed in a continuous jacket or in plates for plane screens, such as shaking or gyrating screens.

Referring to the drawings, in which similar letters of reference denote corresponding parts, A designates a segment formed, preferably, of sheet-steel and provided in this instance with imperforate end margins *a* and imperforate side margins *a'* a^2. This plate is provided with interstices B, substantially rectangular in form. It has been found desirable in practice where rectangular interstices are used to round the corners for the purpose of contributing strength to the junctions of the webs. The interstices B are staggered relatively to each other, being in the present instance arranged continuously in longitudinal series and alternately in transverse series.

The interstices B are bounded by continuous undulating longitudinal webs *b* and by separated inclined transverse webs *c*. It will be noted that the longitudinal webs are so arranged as that a convexity in one web shall be opposite a concavity in the longitudinal webs on either side of it.

The separated transverse webs *c* extend between and connect the convexity of one longitudinal web and the concavity of the next adjacent longitudinal web. Owing to this each transverse web is inclined at an angle relatively to the plane of the screen-surface.

In operation the material is fed upon the screen-surface, preferably from the left in the present instance. Such particles as do not pass through the first row of interstices slide downwardly upon the inclined transverse webs *c*, separating the interstices of the first row, over the concave portions of the longitudinal webs *b* into an interstice B. Should they be of sufficient size to pass through said interstices, such passage is assured by the convexities bounding the other sides of the interstices. Such particles as are not of the proper size to pass through the interstices are interrupted and tumbled by the longitudinal convexities, and the smaller particles, suitable for screening at that portion of the surface, are permitted to pass through the interstices. Such particles of the proper dimensions to pass through the screen as do not pass through, for instance, the first or second row or rows of perforations are guided, not only by the inclined transverse webs, but also by the downward curvature of the convex portions of the longitudinal webs, into the interstices of the next adjacent row. The operation is therefore continuous, the separation of the particles is greatly facilitated, and the useful life of the surface as a whole is prolonged.

What I claim is—

1. A screen-surface having interstices bounded by continuous, undulatory, longitudinal webs and separated, straight, transverse webs, substantially as set forth.

2. A screen-surface having substantially rectangular interstices, the two parallel sides of each interstice being one concave and the other convex, the other two sides being straight and inclined from end to end, relatively to the working face, substantially as set forth.

3. A screen-surface bounded by undulatory, longitudinal webs, each convexity in one of said webs being opposite a concavity in the next adjacent longitudinal web, and by straight, transverse webs extending between and connecting the concavities in one of the longitudinal webs and the convexities in the next adjacent longitudinal web, substantially as set forth.

This specification signed and witnessed this 30th day of September, 1896.

GEORGE W. CROSS.

Witnesses:
S. O. EDMONDS,
JNO. R. TAYLOR.