

(No Model.)

G. W. CROSS.
SCREEN SURFACE.

No. 547,140.

Patented Oct. 1, 1895.

Fig. 1,

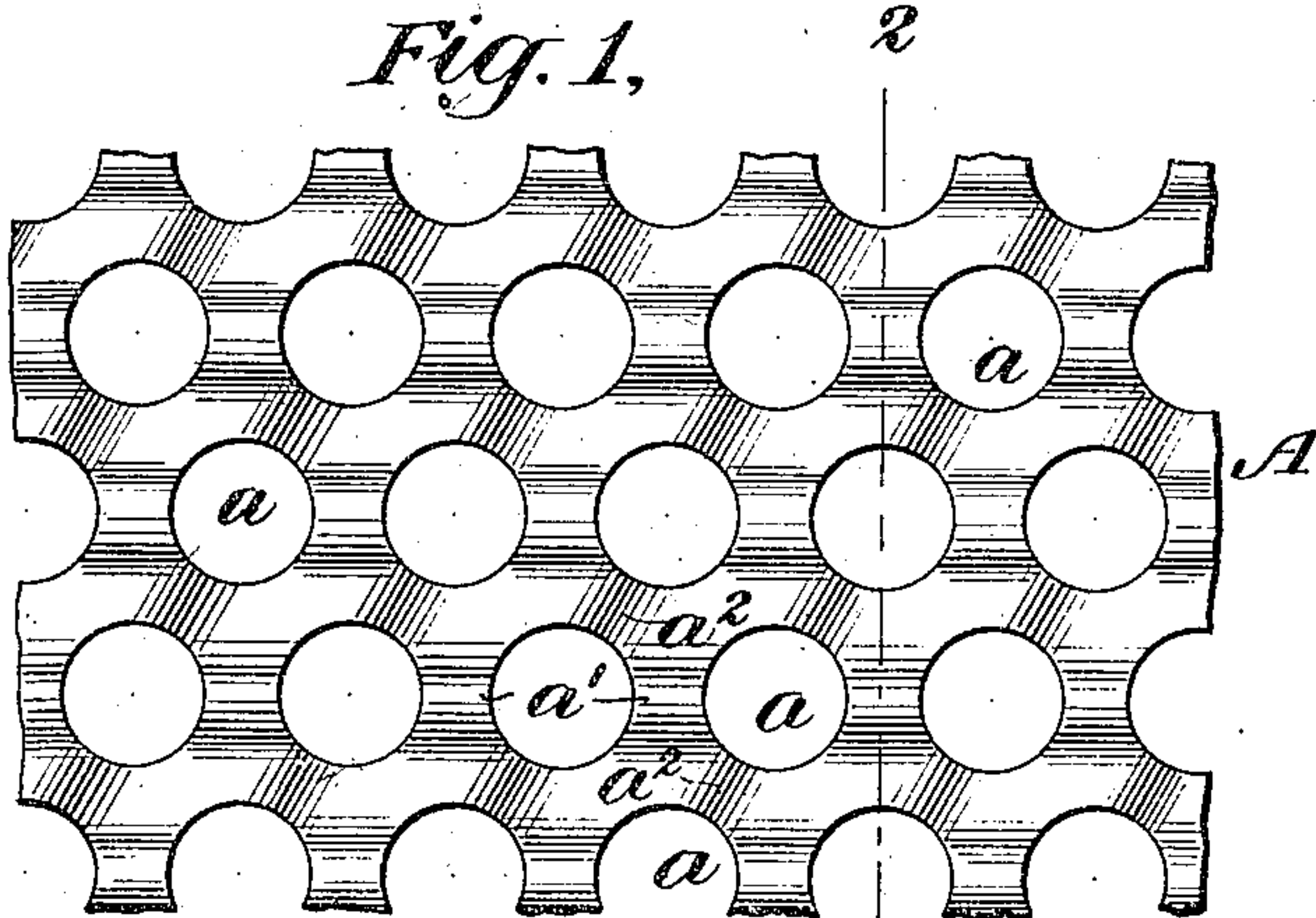


Fig. 2,

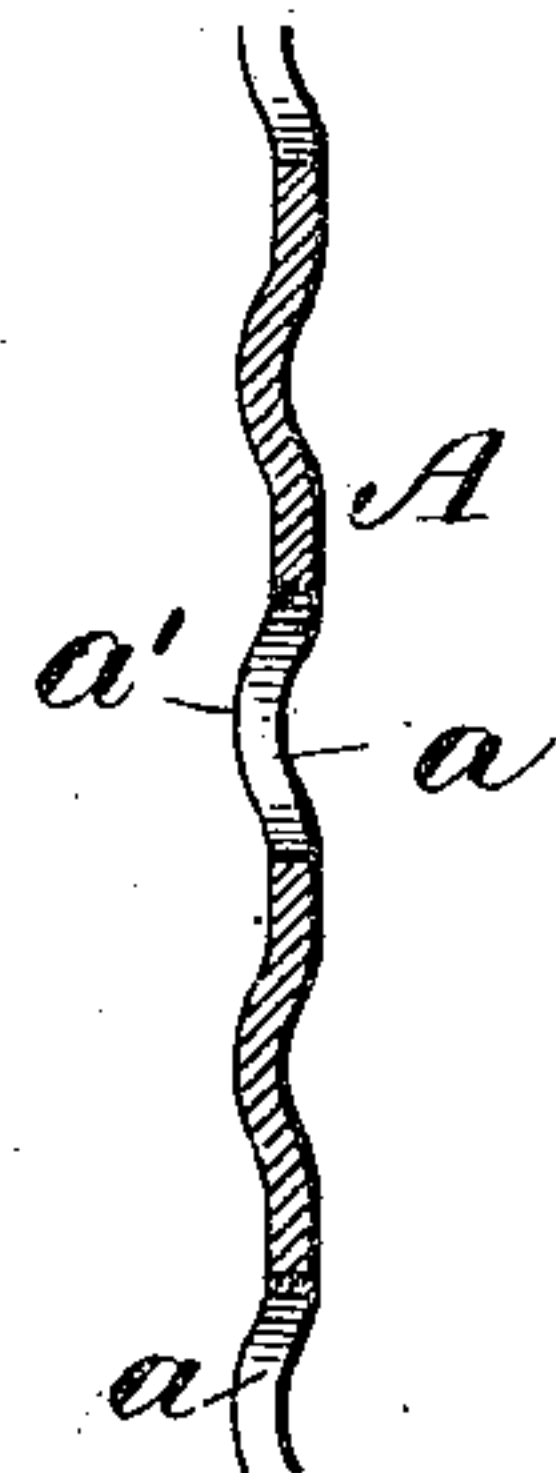


Fig. 3,

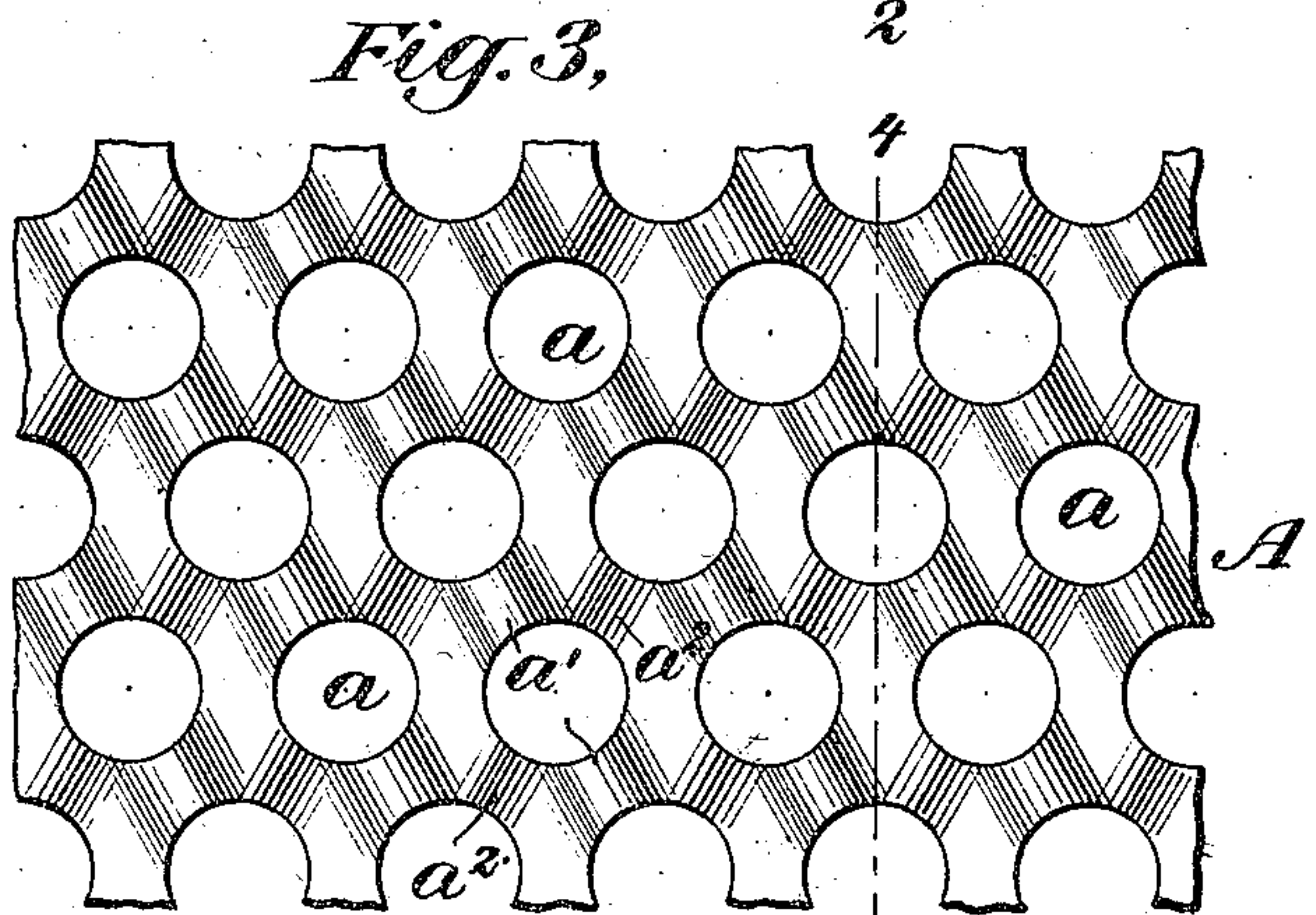


Fig. 4,

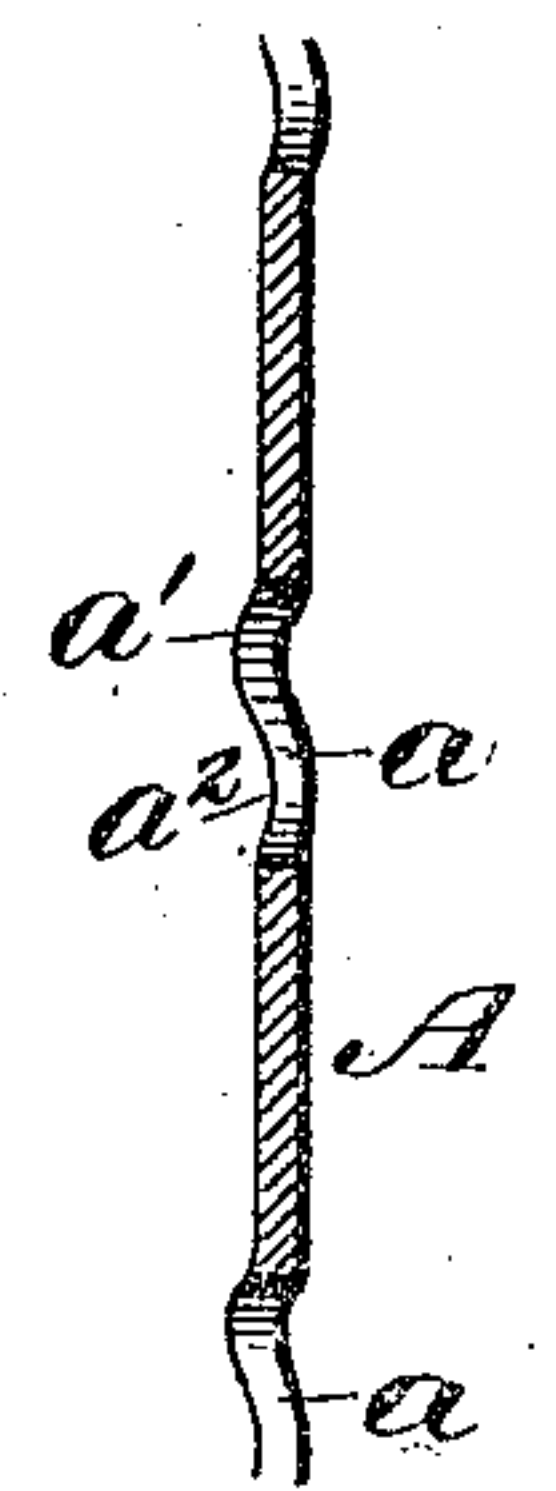


Fig. 5,

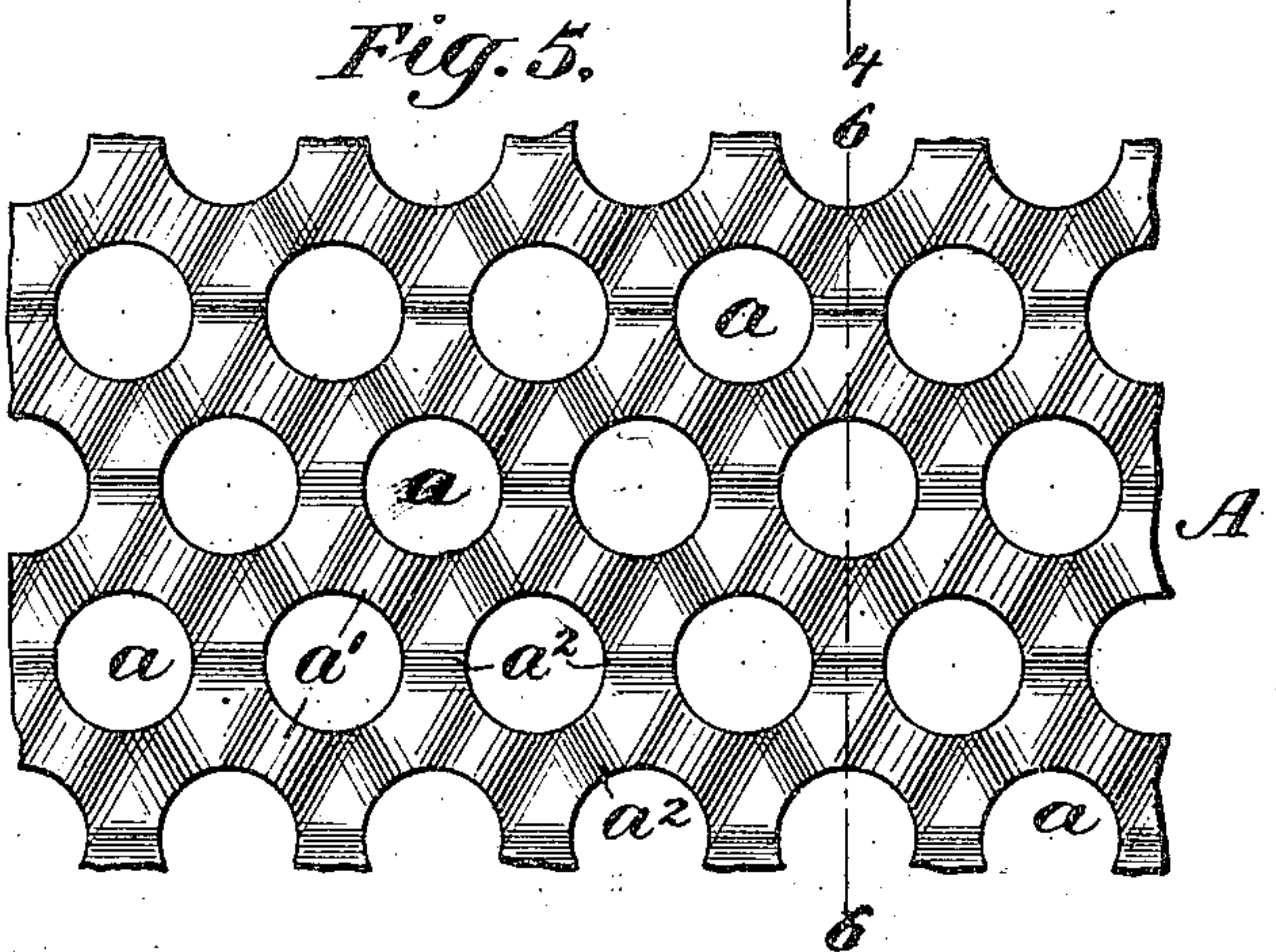
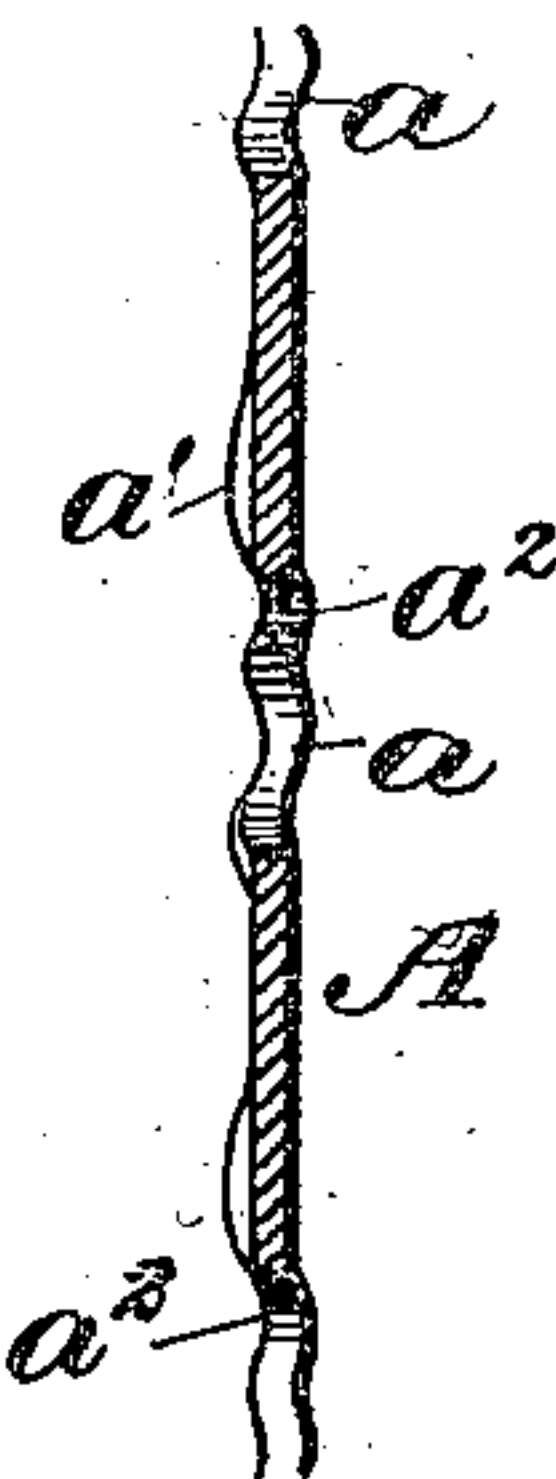


Fig. 6,



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE W. CROSS, OF PITTSBURGH, PENNSYLVANIA.

SCREEN-SURFACE.

SPECIFICATION forming part of Letters Patent No. 547,140, dated October 1, 1895.

Application filed June 24, 1895. Serial No. 553,813. (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, in the county of Luzerne and State of Pennsylvania, have invented a certain new and useful Improvement in Screen-Surfaces, of which the following is a specification.

My invention relates to an improvement in screening-surfaces for use in the separation of coal, stone, ore, &c., into the various sizes. It is designed more especially for use in connection with shaking or gyrating screens, but is capable of use in a revoluble screen in which the material is separated by means of a screening-surface in cylindrical form to which rotary motion is imparted. In shaking or gyrating screens it is customary to mount the screening-surface at an angle, so that the material being placed upon the screening-surface at or near its highest portion will pass over such surface, certain portions thereof being passed through the perforations in the screen meanwhile. These shaking or gyrating screens are commonly mounted one above another, the perforations in each of the screens varying in size to promote the operation of separating the material.

The invention consists of a screening-surface having approximately-circular perforations, the metallic portion of the surface surrounding each perforation being given a peculiar curvature for the purpose, primarily, of distributing the coal over the surface in such manner as to promote the operation of sizing by bringing all of the particles in contact with the surface of the plate almost immediately after the material has been placed upon such surface, instead of at such time as by reason of the shaking, rocking, or gyrating movement of the screen they would be separated from the mass of material so placed on such surface. As will be readily understood, when a mass of material is placed upon a screen, unless means are provided for bringing the particles into intimate relation with the surface, such particles would ride upon each other and be allowed to pass a considerable distance over the screen before coming in contact with the screen-surface itself and passing through the perforations. By means of the present invention this objection is precluded and the material is distributed or

spread out upon the surface of the plate, and such particles as are of the proper size to pass through the perforations therein are aided in such operation.

In carrying out the invention I employ an integral plate, preferably of sheet metal, and of practically-uniform thickness, in which the approximately-circular perforations are punched. Whether the perforations be perfectly round or elliptical in form, the webs which bound them have each two curved sides, which are without angles where one web joins another. In fact, at this point the webs are widest. This peculiarity of the construction, together with the curvature of the webs out of the plane of the plate, greatly conduces to the strength and rigidity of the screening-surface as a whole.

In the drawings, Figures 1, 3, and 5 are plan views of screening-surfaces employing my invention. Fig. 2 is a section upon the line 2 2 of Fig. 1. Fig. 4 is a section upon the line 4 4 of Fig. 3, and Fig. 6 is a section on the line 6 6 of Fig. 5.

Referring to the drawings, in which similar letters of reference denote corresponding parts, A designates a screening-surface having approximately-circular perforations. It is not essential that these perforations should be of the exact form illustrated, as I may, if desired, make them elliptical in form. As illustrated in the drawings, these perforations are staggered in their arrangement upon the screening-surface—that is to say, the web of metal between two perforations is opposite the middle of the perforation in the next adjacent row, the perforations being in line looking across the plate in one direction, but only the alternate perforations being in line looking across the plate in a direction at right angles.

In the process of manufacture the screening-surface is first provided with the perforations *a*. It is then, by means of rollers or dies, given the curvature peculiar to the present invention, and which consists, as shown in the drawings, of making that portion of the surface adjacent to each perforation undulatory.

Referring to Fig. 1, it will be seen that the web surrounding each perforation is bent alternately inward and outward, so as to pre-

sent a continuous wavy or undulatory surface to the action of the coal, the portions a' being bent upwardly, while the portions a'' are bent downwardly in the present embodiment of the invention. It should be understood, however, that, if desired, more than two portions of the web may be given this curvature. For instance, several portions of the webs surrounding each perforation may be bent upwardly, while a corresponding number are bent downwardly.

If it is desired to give the web surrounding each perforation but two depressions and two elevations, as illustrated in Fig. 1, but to vary these and have such elevations and depressions running in different directions, this may be accomplished by changing the direction of feed to the rollers, if such webs are curved by means of rollers or by changing the relation of the dies if the webs be curved by such means. If curved by rollers, the plate, after passing therethrough, may be given the elevations and depressions illustrated in Fig. 1. By changing the direction of feed, however, what is there shown as an elevation may be made a depression, and what is there shown as a depression may be made an elevation. In the construction illustrated in Figs. 3 and 4 the undulatory form is given to the web surrounding each perforation by running the lines of depression and elevation in directions different from those observed in Figs. 1 and 2. In Figs. 5 and 6 the undulations are multiplied, the web around each perforation having a greater number of depressions and elevations than in either of the other forms.

As heretofore explained, the desideratum in the present invention is to provide the working surface with such a curvature as that the motion imparted to the screen after the material has been placed thereon will separate and distribute the material upon such working surface, to the end that the ac-

tion of sizing the coal or separating it into various sizes and expediting its passage through the perforations of the screen may be facilitated. This is attained in the construction illustrated and described. Material being placed upon the surface of such a screen will, owing to the motion imparted to the screening-surface, be spread over a large portion of the screen, and the particles of the mass are brought into almost immediate contact with the screening-surface, whereupon, by reason also of that motion, where the particles are of such size as to pass through the perforations in the screen, this operation is accomplished within much less space than would be required were the surface smooth, as in screens of this class heretofore in use. The facility with which the screening operation is accomplished upon a comparatively small screening-surface is of the greatest importance, economy, not only of a surface subject to wear and tear, but also of the space in which the screens are located, being most desirable.

I do not limit myself to the method above described for providing the screening-surface with the undulations, (to wit, by rollers or dies,) as it is quite obvious that the same result may be accomplished by means of a fuller and swage or a steam or hand hammer.

What I claim is—

An integral screening surface of substantially uniform thickness throughout and having approximately circular perforations, that portion of said surface bounding each perforation being undulatory upon the working face, substantially as set forth.

This specification signed and witnessed this 8th day of June, 1895.

GEORGE W. CROSS.

Witnesses:

EUGENE CONRAN,
S. O. EDMONDS.