No. 665,408. Patented Jan. 8, 1901.

G. W. CROSS.

SCREEN.

(Application filed Mar. 5, 1900.)

(No Model.) 2 Sheets—Sheet 1.

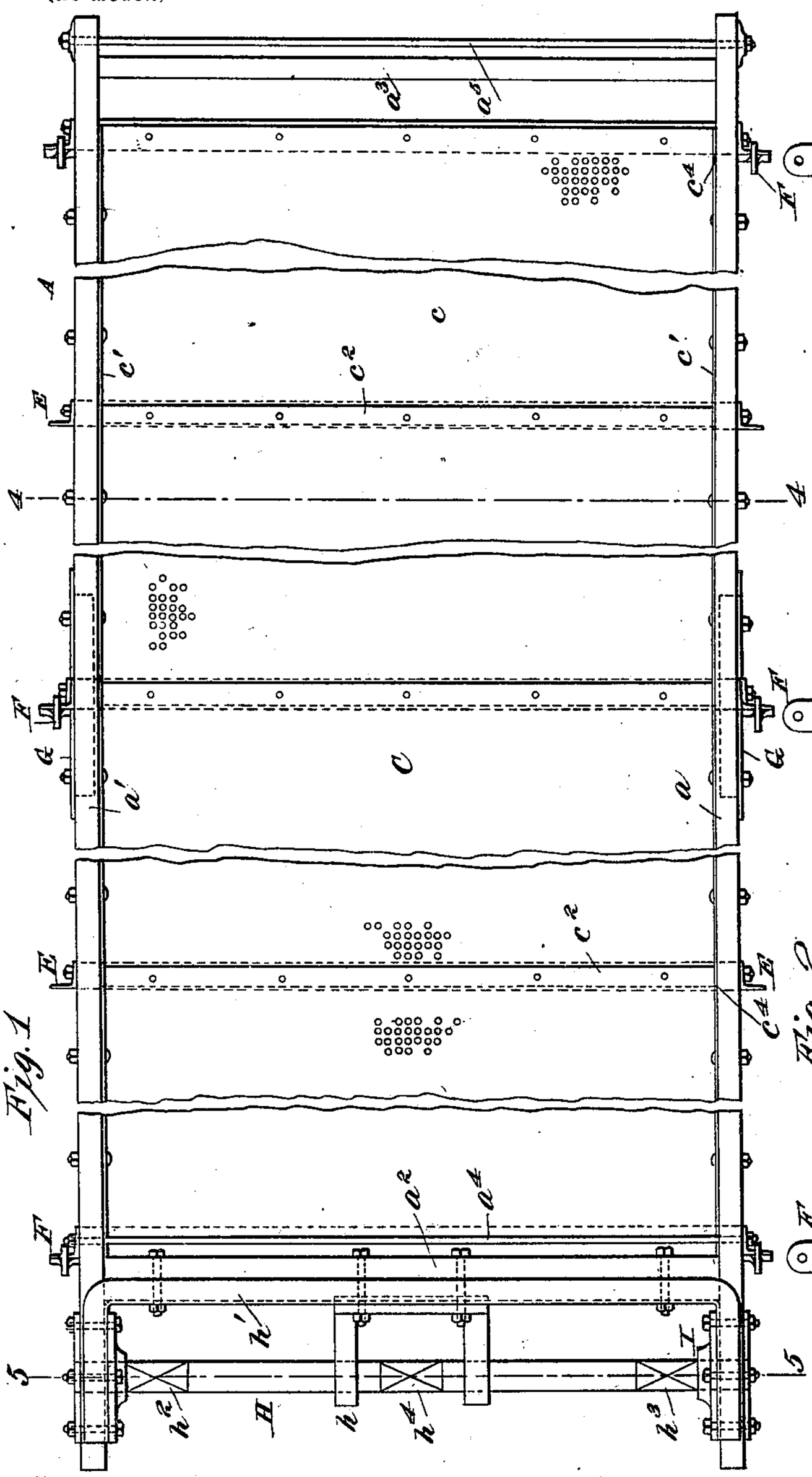

Fig. 1.

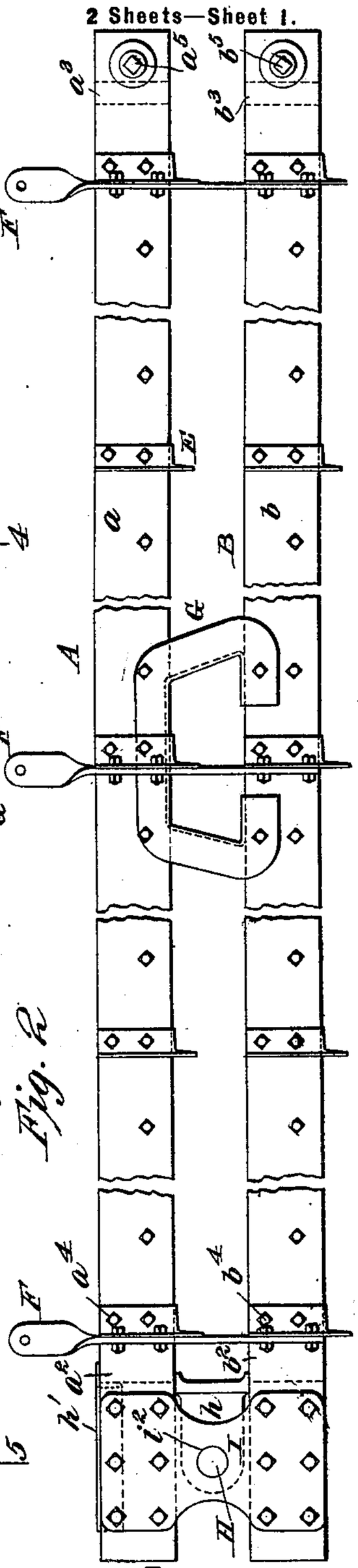

Fig. 2.

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2 Sheets—Sheet 2.

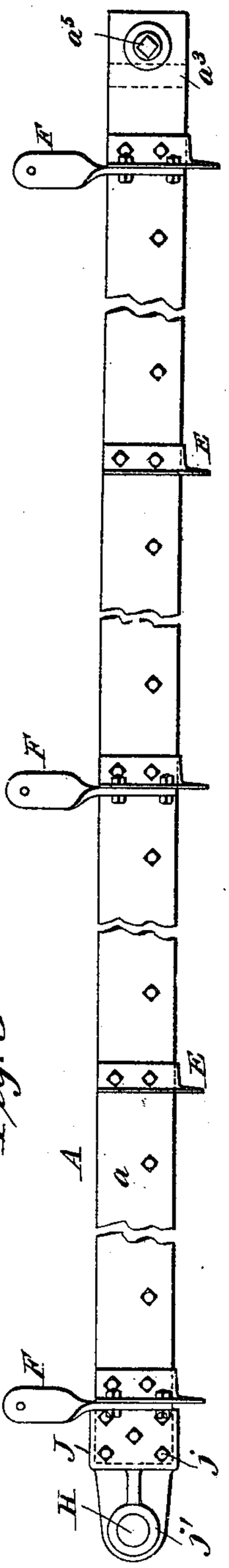

Fig. 3

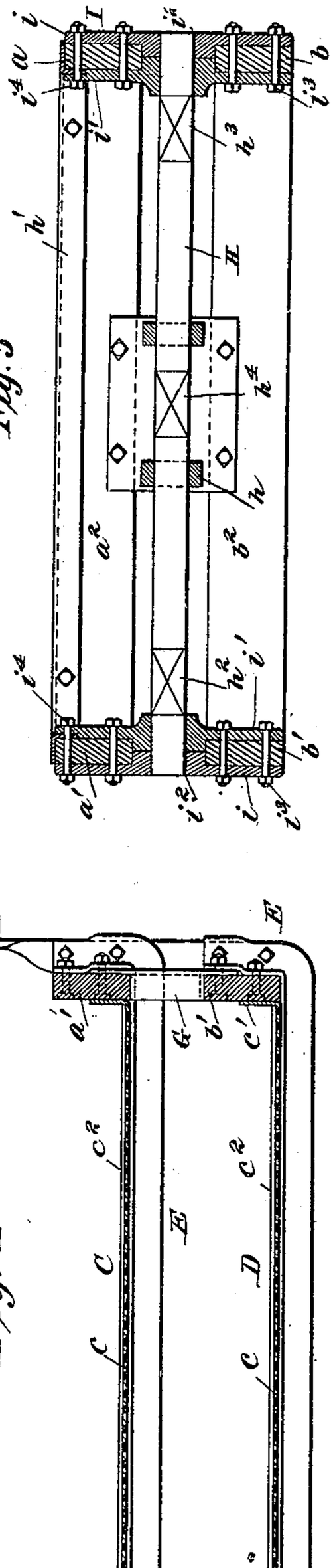

Fig. 5

Fig. 4

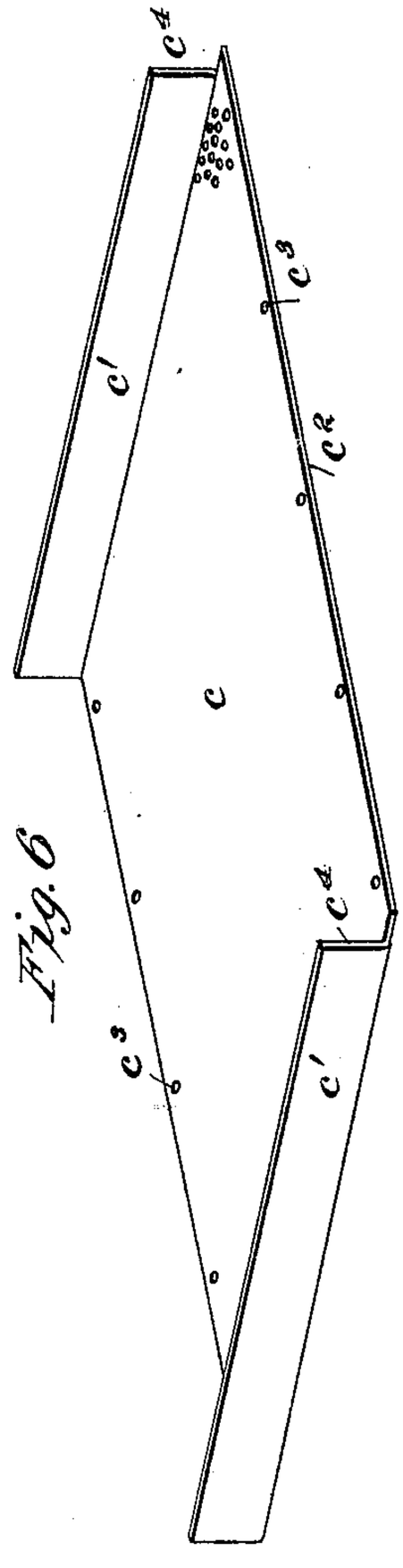

Fig. 6

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UNITED STATES PATENT OFFICE.

GEORGE W. CROSS, OF CARBONDALE, PENNSYLVANIA.

SCREEN.

SPECIFICATION forming part of Letters Patent No. 665,408, dated January 8, 1901.

Application filed March 5, 1900. Serial No. 7,345. (No model.)

To all whom it may concern:

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

My invention relates to screens designed for the separation of coal and other material into various sizes. Screens for this purpose are divisible generally into rotary screens and plane screens. The present invention concerns more particularly the latter type, in that the screening-surfaces are substantially flat. Such screens are commonly known as "shaker-screens." Again, screens of the character referred to are either single or double—that is to say, the separating operation is carried on by means of a single perforated surface or by means of two or more perforated surfaces one placed above the other.

One object of the present invention is to provide a screen which will be efficient in operation, compact, strong, and durable.

A further object is to so construct the screen as to permit of ready and convenient substitution of certain parts, particularly the screen-surface itself, to replace corresponding parts which have become useless through wear.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a double plane screen embodying my improvement. Fig. 2 is a side elevation thereof. Fig. 3 is a side elevation showing the invention embodied in a single plane screen. Fig. 4 is a sectional view on the line 4 4 of Fig. 1. Fig. 5 is a sectional view on the line 5 5 of Fig. 1, and Fig. 6 is a perspective view illustrating one of the screen-plates detached from the screen.

Referring to the drawings, in which similar letters of reference denote corresponding parts, it will be seen that, in general terms, the single screen is substantially the upper portion of the double screen—that is to say, save for some structural changes in the mechanism for imparting movement the double screen is practically two of the single screens rigidly secured together.

Turning first to the double screen (illustrated in Figs. 1, 2, 4, and 5) it will be seen that this consists of two rectangular bodies upon which the screening surfaces are supported. These rectangular bodies consist of upper and lower frames A B, the former comprising side supports a a' and end pieces a^2 a^3. These parts are substantially duplicated in the lower frame in the side supports b b' and end pieces b^2 b^3. Each of the screen-frames A B also comprises tie-rods a^4 a^5 and b^4 b^5.

In the screen-frames A B are supported the screening-surfaces C D. These are made up of perforated sheet-steel plates c, having upturned edges c', the perforations extending only over the flat portion of each plate, save that the upturned edges c' may be perforated for the reception of the bolts, by means of which they are secured to the side supports a a' b b', as illustrated in the detail view Fig. 6. The upturned edges c' of each of the plates are cut away at c^4, so that in applying the plates to the screen the edge c^2 of one plate may overlap the end of the next adjacent plate and be secured thereto by means of bolts or rivets passing through the perforations c^3 or by other suitable means. When this is done, the upturned edges of the next adjacent plate will abut against the ends c^4 of the upturned edges c'. By thus overlapping the ends of the plates a rigid joint may be secured, screening-surface economized, and the rigidity of the screen as a whole increased.

E E designate U-shaped supports extending under and forming part of each screen-frame, the upturned legs of said supports being secured, preferably, by means of bolts to the side supports a a' b b'. These U-shaped supports are formed of angle-iron, and I have shown one such support for each section or screen plate, each support extending from one side of the screen-frame to the other at that point at which the ends of the screen-plates overlap. If desired, the ends of the screen-plates may be secured to the angle-irons, although I do not deem this important, in view of the inconvenience of replacing the plates if so secured.

Secured to the screen-frame are hangers F, by means of which the screen as a whole is pivotally mounted upon suitable stationary beams or other supporting medium. I have found it convenient to secure these hangers F to the screen-frame by means of bolts co-

acting with said hangers and with the upwardly-projecting legs of certain of the U-shaped supports E. In the screen of the double type, as herein illustrated, the U-shaped supports of both the upper and lower screen-frames are so secured to said hangers.

Intermediate of the ends of the screen I have found it desirable to further secure the two screen-frames together by means of stay-frames G. As here shown, these also are formed of angle-iron, the inwardly projecting web of each stay being in contact with a portion of the under side of the upper screen-frame and with a portion of the upper side of the under screen-frame B. Each stay is secured to the side supports of both screen-frames by any suitable means—such, for instance, as bolts—and these bolts may, if desired, be those which are used to secure the screen-plates in position in the frames.

H designates the transverse screen-shaft, by means of which oscillating motion is imparted to the screen. This is supported midway its length by the bearing-frame *h*, carried by the end pieces a^2 b^2 of the screen-frames. Located along the top of the end piece a^2 of the upper screen-frame is a U-shaped angle-iron *h'*, the legs of which extend outwardly over the tops of the side supports *a* *a'* and are secured to the end bearings I of the screen-frame, now to be described.

The end bearings of the screen-frame are shown in detail in Fig. 5. Each consists generally of two castings *i i'*, centrally perforated at i^2 and provided, when in contact, with recesses above and below, in which are received the ends of the side supports of the screens, these being secured in such position preferably by means of bolts i^3 i^4, the latter in this instance passing through the downturned web of the U-shaped angle-iron *h'*, thereby binding the entire structure at this end of the screen firmly in place. The transverse shaft H may, if desired, be rigidly secured in the perforations a^2 of the end bearings. This, however, is unimportant, and, if desired, the screen-shaft may have movement in said bearings. Said shaft is provided with bearing-surfaces h^2 h^3 near either end, and also with a central bearing-surface h^4. These bearing-surfaces are designed to coact with suitable eccentrics, to which motion may be imparted in any desired manner, and either one or more of said bearing-surfaces may be connected with such eccentrics, as preferred.

In Fig. 3 I have shown a single plane section, such as has been heretofore referred to. The general structure of this screen, as already explained, is the same as that above described. That end of the screen, however, to which is connected the transverse oscillating shaft is provided with bearings J, each consisting of a casting embracing three sides and the end of a side support *a*, bolts *j* being employed to secure said castings and side supports rigidly together. Each casting is also provided with an outward extension *j'*, preferably centrally perforated to receive the operating-shaft, which may be the same in all respects as the shaft H, heretofore described.

What I claim is—

1. In a screen, the combination of the side frames, a plane screen-surface having upturned edges secured between the side frames, and continuous supporting-braces extending beneath the screen-surface and secured to the outsides of the side frames, substantially as set forth.

2. In a screen, the combination of the side frames, a plane screen-surface having upturned edges secured between the side frames, continuous supporting-braces extending beneath the screen-surface and secured to the outsides of the side frames, and hangers secured to the vertical portions of said supporting-braces, substantially as set forth.

3. In a double screen, the combination of two rectangular frames, a plane screen-surface secured between each frame, supporting-braces arranged beneath the screen-surfaces and secured to the outsides of the side members of the frames, and hangers connecting the vertical portions of said supporting-braces for supporting the screen and for connecting the rectangular frames together, substantially as set forth.

4. In a double screen, the combination of two rectangular frames, a plane screen-surface secured between each frame, supporting-braces arranged beneath the screen-surfaces and secured to the outsides of the side members of the frames, hangers connecting the vertical portions of said supporting-braces for supporting the screen and for connecting the rectangular frames together, a pair of castings connecting the side frames of both screens together at one end, and a shaft mounted in said castings, substantially as set forth.

This specification signed and witnessed this 1st day of March, 1900.

GEORGE W. CROSS.

Witnesses:
J. R. VANDERFORD,
G. D. YARRINGTON.