

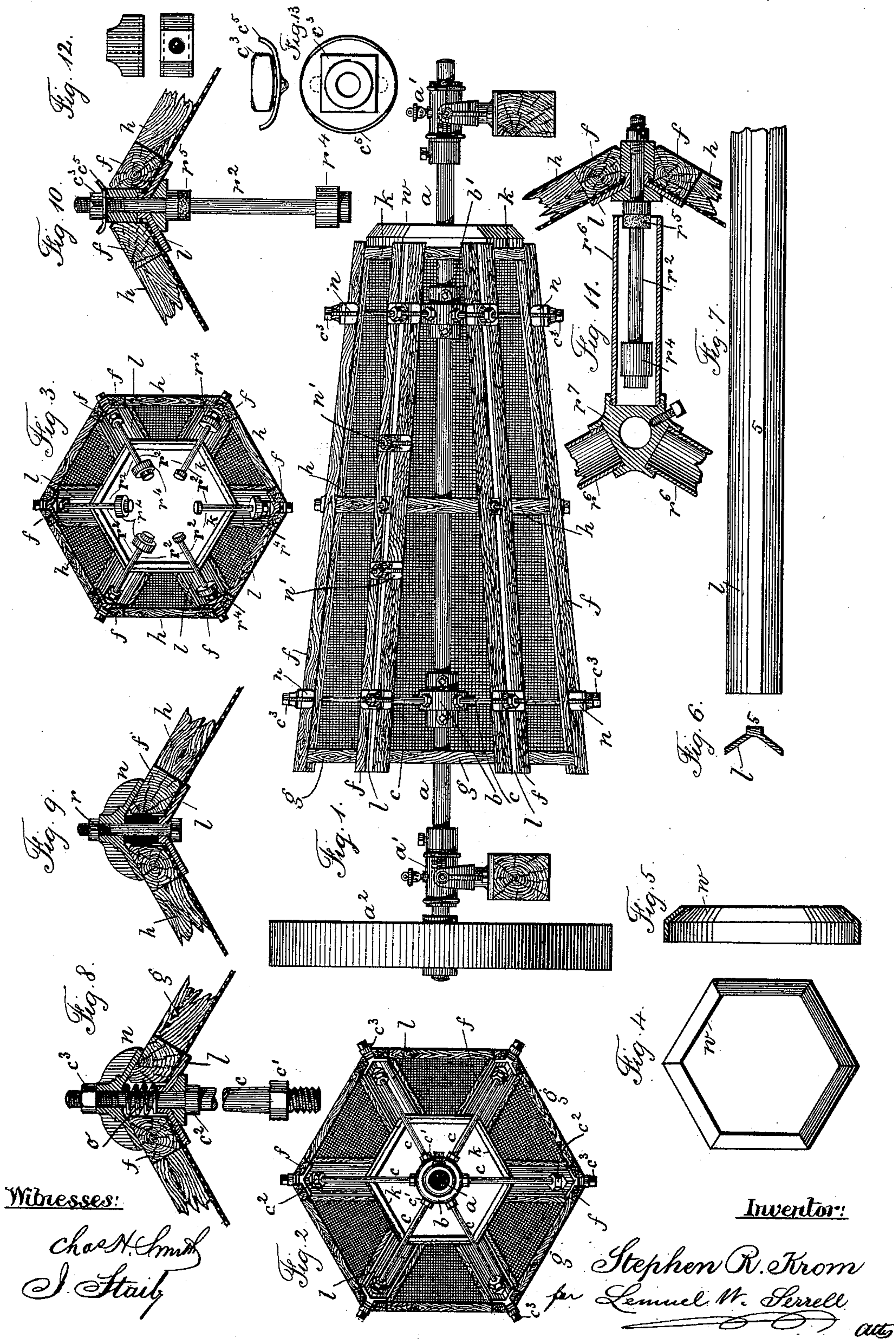
(No Model.)

S. R. KROM.

SCREEN FOR ORES AND MINERAL SUBSTANCES.

No. 338,847.

Patented Mar. 30, 1886.



UNITED STATES PATENT OFFICE.

STEPHEN R. KROM, OF PLAINFIELD, NEW JERSEY.

SCREEN FOR ORES AND MINERAL SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 338,847, dated March 30, 1886.

Application filed May 25, 1885. Serial No. 166,561. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN R. KROM, of Plainfield, county of Union, in the State of New Jersey, have invented an Improvement
5 in Screens for Ores and Mineral Substances, of which the following is a specification.

My improvement relates to the frames for supporting the screen-sections, such frames being removable from the shaft and heads to
10 which they are connected, so that either screen-section may be removed and another one be substituted. The metal portions which connect the wooden frames to the hubs and shaft are movable, and hold the screen-sections in
15 their proper relation to the shaft to cause the entire screen to run true and uniform.

In the drawings, Figure 1 is an elevation of the screen-section and shaft with some of the woven-wire screen-sections removed. Fig. 2
20 is an end view of the screen. Fig. 3 is a cross-section at the middle of the screen. Figs. 4 and 5 represent the polygonal ring at one end of the screen. Figs. 6 and 7 are end and side views of the wrought-iron angle-bar. Figs.
25 8 and 9 are detached views of the bolts and clamps for holding the edges of the screen-frames. Figs. 10 and 11 are views of the sliding percussion devices. Fig. 12 is a side view and plan of the block around the per-
30 cussion-bolt and between the screens, and Fig. 13 shows the nut and spring-washer detached.

The shaft *a* is supported in journal boxes or bearings *a'*, and it is rotated by a suitable pulley, *a''*.

Upon the shaft *a* there are placed two hubs, *b* *b'*, into which are screwed the spokes *c* *c'*, the same occupying radial positions and being provided with heads *c'*, to which a suitable wrench or key is applied for screwing the
40 spokes firmly into the hubs or for removing the same if the spokes are broken. The spokes *c*, extending radially from the hub *b'*, are shorter than the spokes that extend radially from the hub *b*, in order that the bars which
45 hold the angles of the screen-sections may be at an inclination to the axis *a*; hence the screen will be a truncated pyramid. Each radial spoke *c* is provided with a collar, *c''*, and at the outer end is a screw receiving the nut *c'''*.
50 The screen-sections themselves are made wider at one end than the other, so as to conform to the shape of the truncated pyramid. Each

screen-section is of wire, made in the ordinary manner, and secured to the wooden frame.

The wooden frame is composed of the lon- 55
gitudinal side pieces, *f*, and cross-pieces *g h k*. The cross-pieces *h* serve to strengthen the frames in the middle portions.

The screen-sections are usually applied to the inner surfaces of the frames and nailed on 60
or otherwise secured.

Between the radial spokes *c*, and supported by them, are the bearer-bars *l*. (Shown in the detached views, Figs. 6 and 7.) The surfaces of these bearer-bars *l* are at an angle to each 65
other corresponding to the angles between the surfaces of the truncated pyramid, and such bearers are ribbed, as at 5, to strengthen the bars and form stops against which the edges of the screen-frames *f* lie. 70

Upon the outer end of each of the spokes *c* there is a clamp, *n*. (See Figs. 1, 8, and 9.) The inner surfaces of these clamps are at an inclination to each other corresponding to the inclination of one screen-section to the other, 75
and these clamps *n* are held down upon the edges of the screen-frames by the nuts *c'''*. By this construction I am enabled to remove any one of the screen-frames by simply loosening the nuts *c'''* and slipping the screen-frame out 80
endwise, and another screen-frame may be introduced by the reverse movement, by which such frame is slipped beneath the clamps *n*, and held in place by tightening the nuts *c'''*. These parts thus far described alone may be 85
used; but I prefer to introduce a helical spring, *o*, around each of the spokes *c*, between the bearer-bar *l* and the clamp *n*, so that when the nut *c'''* is loosened such helical spring *o* will lift the clamp *n*, and hold the same away from 90
the bearer-bar *l*, thereby enabling one man to remove a screen-section and introduce another, without requiring separate men to hold the clamps *n*, or to remove the same, for allowing the screen to be introduced beneath them. It 95
is also to be understood that the clamps *n* may be applied at suitable distances apart along the line of the edges of the screen-sections. I have shown such separate clamps in Fig. 9, and at *n'*, Fig. 1. These are to be made in the 100
manner before described, but a separate bolt, *r*, is made use of, in place of the bolt formed by the end of the radial spoke *c*. The open polygonal ring or head *w* within and connect-

ed to the ends of the bearer-bars shown in Figs. 4 and 5 is to be introduced at the smaller end of the screen to form a mouth, into which the material to be screened is received, and as the screen is revolved such material passes gradually from the smaller to the larger end, and the particles that are sufficiently fine pass through the meshes, and the coarser substances are delivered at the larger end of the screen.

In screens of this character the meshes become obstructed by particles that are too large to pass through. These require to be removed. I make use of sliding percussive agitators that act upon the screen-sections when at their highest points, in order that the said particles may be shaken out of the meshes and fall within the revolving screen. Bolts are passed down radially through the angle-bars l , and secured by nuts and washers. These bolts may be continuations of the clamping-bolts r , Fig. 9; but I prefer to use separate bolts. These are shown at r^2 , Figs. 3, 10, and 11. Each bolt has around it a tubular weight, r^4 , and an elastic washer, r^5 . As the screen revolves, the weights r^4 slide endwise upon the bolts and fall against the elastic washers at the lower side of the screen, and at the upper side of the screen they strike against the bolt-heads and produce an agitation or vibration of the screen-frame in consequence of the percussive action; hence any particles of ore, coal, or other material which have become wedged into the meshes, or which may adhere, are shaken off and fall, thereby keeping the meshes clear. In some instances the percussive agitators are protected by the tubes r^6 , (see Fig. 11,) such tubes being supported at their inner ends by a hub, r^7 , upon the shaft a . The outer ends of these tubes r^6 should be open, in order that any mineral substance may fall out of such tubes, and not interfere with the action of the agitators.

The constant jar of the hammers r^4 upon the frames of the screen-sections tends to loosen the nuts c^3 of the arms and clamps. I have provided sheet-metal spring-washers c^5 , which are placed between the nuts and the clamps, as shown in Figs. 10 and 13. These washers have depressions or teats on the under sides, which fit into corresponding cavities in the surfaces of the clamps. These teats on the washers prevent them from turning around when the nuts are screwed down. Two sides of each washer are bent or curved upward, and when the square nut is screwed down it springs down the washer, to let the corners pass the turned-up sides, and, springing back again as the corners pass, prevents the nut from turning back without force applied by a wrench.

I claim as my invention—

1. The combination, with the screen sections and frames, of the angle-iron bearer-bars l , ribbed at 5, the spokes c , collars c^2 , hubs b b' , shaft a , clamps n , and nuts c^3 , substantially as set forth.

2. The combination, with the screen-sections, frames, and the shaft a , of the clamps n , bearer-bars l , spokes c , nuts c^3 , and springs o , substantially as set forth.

3. The combination, with the screen sections and frames, of the angle-iron bearer-bars l , ribbed at 5, clamps n , spokes c , nuts c^3 , and springs o , substantially as set forth.

4. The combination, with the revolving screen, of the headed bolts r^2 , the inclosing-tubes r^6 and their hubs r^7 , the sliding weights r^4 , and the elastic cushion r^5 , substantially as set forth.

5. The combination, with the revolving screen, of the headed bolts r^2 , the inclosing-tubes r^6 and their hubs r^7 , and the sliding weights r^4 , substantially as set forth.

6. The combination, with the screen-sections, the frames, and the bolts, of the clamps n , the nuts c^3 , and the intervening spring-washers c^5 , substantially as set forth.

7. The combination, with the screen-sections and their frames, the angle-iron bearer-bars l , and spokes c , of the clamps n , the separate bolts r at intervals between the spokes, and the nuts upon said bolts, substantially as specified.

8. The combination, with the screen-sections and their frames and bolts, of the angle-iron bearer-bars l , spokes c , clamps n , the nuts c^3 , and the intervening spring-washers c^5 , said washers having teats or depressions, substantially as specified.

9. The combination, with the revolving screen having screen-sections and their frames, of the bearer-bars l , the headed bolts r^2 , passing through the bearer-bars l , the nuts and collars for the bolts r^2 , the sliding weights r^4 upon said bolts, and the elastic cushions r^5 , substantially as specified.

10. The angle-iron bearer-bars l , spokes c , and the open polygonal ring or head w within and connected to the ends of the bearer-bars and forming the smaller end of the screen, in combination with the removable screen-sections and their frames, substantially as specified.

Signed by me this 13th day of May, A. D. 1885.

S. R. KROM.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.