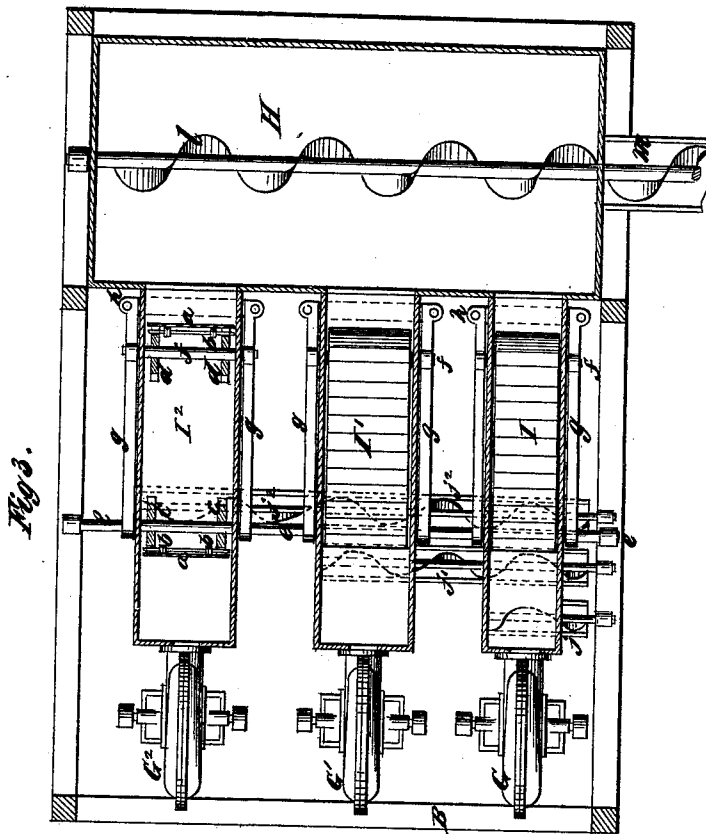




H. HOCHSTRATE.  
Machinery for Separating Ores.

No. 213,421.

Patented Mar. 18, 1879.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

HEINRICH HOCHSTRATE, OF ZECHÉ RHEINPREUSSEN, HOMBERG-ON-THE-RHINE, GERMANY.

## IMPROVEMENT IN MACHINERY FOR SEPARATING ORES.

Specification forming part of Letters Patent No. 213,421, dated March 18, 1879; application filed December 12, 1878.

To all whom it may concern:

Be it known that I, HEINRICH HOCHSTRATE, of Zeche Rheinpreussen, Homberg-on-the-Rhine, in the Empire of Germany, have invented certain new and useful Improvements in Machines for Separating or Sorting Ores, of which the following is a specification:

The object of my invention is to produce a machine in which ores or other substances in a crushed or granular state, and of different degrees of fineness, may be separated, and preferably, also, cleaned at one operation.

My invention consists in a machine comprising a rotary screen or sieve, perforated or of reticulated material, portions of which are of different degrees of fineness, in which the material to be separated is placed, and which delivers the different grades of ore or other material into hoppers placed underneath the screen or sieve, from whence it passes to passages or channels which are horizontal or nearly horizontal, and through which currents or blasts of air are forced. These passages or channels are provided with movable floors attached to endless bands or chains, to which a regular progressive motion is imparted, and which aid in effecting the separation of the ore.

It also consists in various details of construction, hereinafter to be explained.

In the accompanying drawings, Figure 1 represents a vertical section of a portion of a building containing my machine, and also a section of a portion of such machine. Fig. 2 represents a vertical section thereof on the dotted line *x x*, Fig. 1, at right angles to Fig. 1; and Fig. 3, a horizontal section on the dotted line *y y*, Fig. 1.

Similar letters designate corresponding parts in all the figures.

A designates a screen or sieve, formed of perforated or reticulated material. It is slightly inclined, and its shaft is carried in suitable bearings in the frame-work B, and may be revolved by means of a gear-wheel, C, and pinion D. Its surface is shown as formed of wire-gauze, which has the finest meshes at the high end, where the material to be treated is introduced. The surface is shown as divided into three portions, the meshes of each portion be-

ing coarser than the one above it. Thus the material is divided into three different grades, each of which falls into separate hoppers, E E<sup>1</sup> E<sup>2</sup>, placed below the screen.

The material to be screened passes downward by the revolving of the screen until it all escapes through its meshes.

Each of the hoppers E E<sup>1</sup> E<sup>2</sup> communicates with a channel or passage, F F<sup>1</sup> F<sup>2</sup>, preferably arranged horizontally, and through which passes a strong current or blast of air, which may be maintained by means of fan-blowers G G<sup>1</sup> G<sup>2</sup>. As the material falls into this channel or passage it is met by the air-current, and all dust and foreign matters which are light are carried into the dust-chamber H. These channels or passages are preferably provided with movable floors I I<sup>1</sup> I<sup>2</sup>, which may consist of slats *a*, secured to endless chains *b*. These chains are carried by chain-wheels *cd*, mounted upon shafts *ef*, and have a regular progressive movement. The shaft *e* passes through the three channels or passages F F<sup>1</sup> F<sup>2</sup>, and forms a fulcrum for levers *g*, which carry the short shafts *f*, and are supported at their other ends by means of screws *h*, which may be adjusted to vary the inclination of the floors I I<sup>1</sup> I<sup>2</sup>. As the material falls upon these movable floors the rounded heavy particles roll forward and down into the hoppers J J<sup>1</sup> J<sup>2</sup>, while the flat particles stay upon the floors, and by the movement of the floors are carried back into the hoppers K K<sup>1</sup> K<sup>2</sup>.

If desirable, the movable floors I I<sup>1</sup> I<sup>2</sup> may be covered with leather, rubber, or some material that will hold flat particles upon them by friction until they are carried to the end of the floor, when they will drop into the hoppers K K<sup>1</sup> K<sup>2</sup>. The leather or rubber covering may be provided with indentations or projections, if desirable, so as to hold particles thereon. The rounded granules which are deposited in the hoppers J J<sup>1</sup> J<sup>2</sup> may be allowed to pass out into a car or other receptacle by opening the sliding gates *i i<sup>1</sup> i<sup>2</sup>* at their lower ends.

The flat or other particles of material which are carried by the moving floors I I<sup>1</sup> I<sup>2</sup> and deposited in the hoppers K K<sup>1</sup> K<sup>2</sup> are carried away from the hoppers by means of conveyers, which may consist of rotating screws or

worms  $j^1 j^2$ , which, by their rotation, move the material through the trough  $k^1 k^2$  to any suitable receptacle. The dust-chamber H is also preferably provided with such a conveyer,  $l$ , by which the dust and dirt are removed from the chamber through the trough  $m$ .

In order to increase the efficiency of the machine the movable floors  $I^1 I^2$  are provided with shakers  $n$ , which consist of beams or levers, which may be rocked upon their fulcrums  $o$ , to agitate the material upon the upper surface of the floors.

By my machine I provide means for separating or sorting the ore or other material to be treated, and at the same time effectually cleaning it of dust and dirt; and as the movable floors may be adjusted to any inclination, materials of different specific gravities may be treated with equal facility.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a screen or sieve for separating or sorting ore of different sizes, and one or more hoppers for the reception of such ore, each hopper communicating with a channel or passage, through which a current or blast of air passes, of movable floors for the said channels or passages, having a regular progressive movement, and hoppers into which the ore is delivered by the said movable floors, substantially as specified.

2. The combination, with a screen or sieve for separating or sorting ore of different sizes, and one or more hoppers for the reception of such ore, each hopper communicating with a channel or passage, through which passes a current or blast of air, of movable floors for

the said channels or passages, having a regular progressive movement, and means whereby the said movable floors may be adjusted at different inclines, substantially as specified.

3. The combination, with a screen or sieve for separating or sorting ore of different sizes, and one or more hoppers for the reception of such ore, each hopper communicating with a channel or passage, through which passes a current or blast of air, of movable floors for said channels or passages, having a regular progressive movement, and shakers for agitating the same, substantially as specified.

4. The combination, with a screen or sieve for separating or sorting ore of different sizes, and one or more hoppers for the reception of such ore, each hopper communicating with a channel or passage, through which passes a current or blast of air, of movable floors for said channels or passages, having a regular progressive movement, and hoppers into which ore is delivered by said movable floors, and which are provided with conveyers for automatically conveying the ore away from said hoppers, substantially as specified.

5. The combination of the screen or sieve A, hoppers  $E^1 E^2$ , channels or passages  $F^1 F^2$ , blowers  $G^1 G^2$ , dust-chamber H, movable floors  $I^1 I^2$ , hoppers  $J^1 J^2$ , and hoppers  $K^1 K^2$ , substantially as specified.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of August, 1878.

HEINRICH HOCHSTRATE.

Witnesses:

HERMANN HERKENDELL,  
WILHELM REHFENTER.