M. NEUERBURG.

DRUM SCREENS FOR MINERALS.

No. 182,693. Patented Sept. 26, 1876.

Fig. 1.

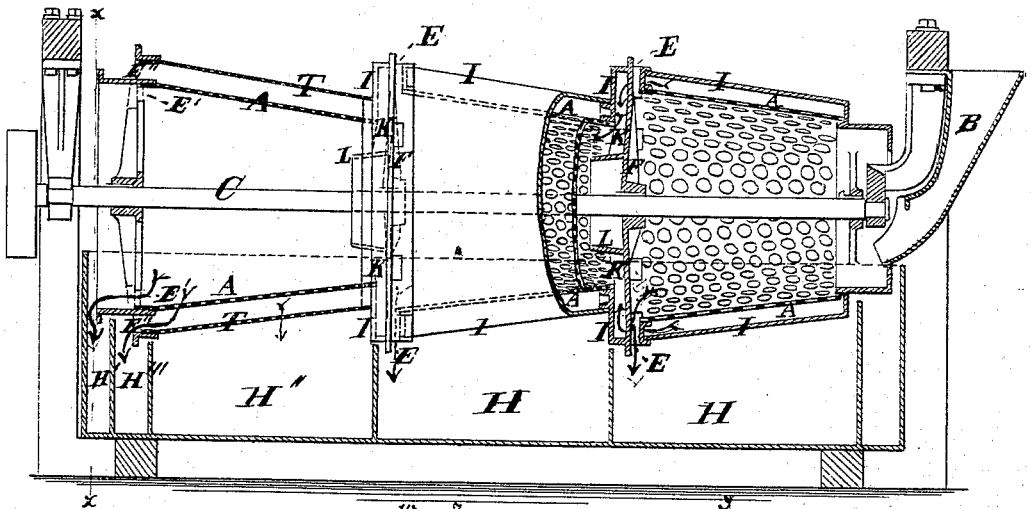


Fig. 2

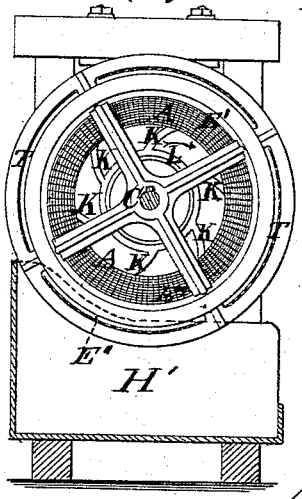


Fig. 3.

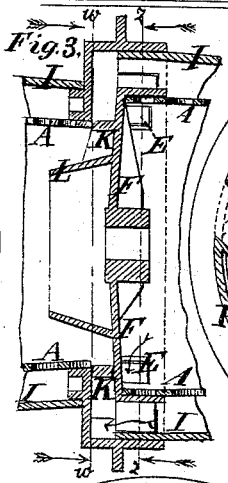


Fig. 4.

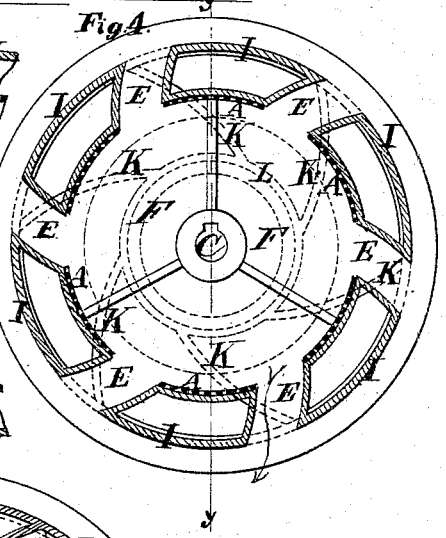
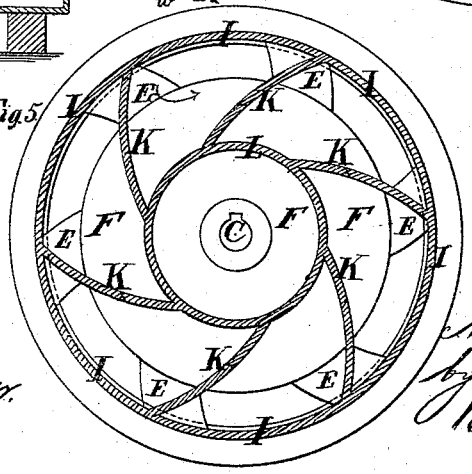


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

MARTIN NEUERBURG, OF KALK, NEAR COLOGNE, GERMANY.

IMPROVEMENT IN DRUM-SCREENS FOR MINERALS.

Specification forming part of Letters Patent No. **182,693**, dated September 26, 1876; application filed August 31, 1876.

To all whom it may concern:

Be it known that I, MARTIN NEUERBURG, of Kalk, near Cologne, in the Empire of Germany, have invented an Improvement in Drum-Screens; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms part of this specification.

My invention has for its object the separation into different grades of fineness of ground minerals, chemical products, &c.; and it consists in a series of conical drum-screens, arranged on a single shaft, and each, except the terminal one, remotest from the hopper, provided with a mantle, and passages leading from such screen through said mantle, whereby, while the finer portions of the material fed to such screen are collected by the said mantle and carried forward to other screens for more refined separation, the coarser part separated is discharged through the passages leading from the interior of the screen. In this way the coarser portions are separated and discharged before the finer portions in the order of their gradation from coarse to fine.

For dressing ores and coals, and for utilizing reduced minerals and chemicals, it is often necessary to separate the materials into several sizes of grains. For this purpose hand sieves or screens, as well as power-screens, jiggers, &c., have been employed, but more recently rotating drum-sieves have been adopted.

Rotating drum-sieves have had various forms and arrangements, and their operation has been measurably satisfactory for assorting a few sizes; but not so for assorting all sizes of grains—a greatly-desired result, to attain which several independent sieves or screens and operations have been requisite.

An improvement on the aforesaid method was made by arranging several drum-sieves one above another, the number of such sieves corresponding with the different grades into which it was desired to assort the material. This rendered possible the separation of the coarse grains first, and successively the finer grains, in the order of their fineness, and, therefore, constituted an important advance in the art.

The advantages gained by this system were as follows: It was no longer necessary to place on the finer and more costly screens the entire mass of material to be separated, the great friction of which load formerly wore out rapidly the fine screens, which, being most subject to wear, had to be frequently replaced. The mass, on the contrary, was first fed to the coarse screens, which being more durable, the wear and tear were thus reduced to the minimum. Moreover, in the improved system the sieves could be made of dimensions exactly to suit the quantity of the material to be treated, and consequently the cost of construction was diminished; but these important advantages were accompanied by the disadvantages that, owing to the great height of the arrangement, elevators, lifting-machines, &c., had to be employed for raising the material to be separated to the topmost screen, which additional machinery rendered the entire arrangement complicated and costly, and entailed expenditure of power to elevate the material.

These disadvantages are entirely obviated by my invention without sacrificing any of the advantages of the method of proceeding from coarse to fine grades in the process of separation.

In the drawing, Figure 1 represents a partial side elevation, and a partial section of my improved rotating drum-screen. Fig. 2 is a cross-section on the line *x x* in Fig. 1. Fig. 3 is a section on the line *y y* in Fig. 4. Fig. 4 is a section on the line *z z* in Fig. 3. Fig. 5 is a section on the line *w w* in Fig. 3.

A, Figs. 1, 2, 3, and 4, represents screens which are graduated, in the fineness of their meshes, successively from the hopper B, the one nearest the said hopper being the coarsest in its meshes, the next finer, and so on to the last, each being finer than the one next nearer the said hopper. The said screens are conoid in form, having their larger diameters farthest from the hopper B. They are separated by partitions F, Fig. 1, and are attached to and rotated by a common shaft, C. At the largest ends of said screens A, except the one farthest from the hopper B, are formed passages

E, Figs. 1, 4, and 5, through which all the material, too large to pass through the meshes of the said screens, is discharged into the assorting-boxes H. Such of the material as passes through the meshes of the screens, except at the screen farthest from the hopper B, is temporarily retained by mantles I, which are of the same form as and are attached to said screens, and which pass entirely around and inclose the said screens, except the one farthest from the said hopper. Each of the said mantles I, moreover, passes down over the larger end of its screen till it meets the screen next it, leaving spaces between said mantles and the partitions F, in which spaces are placed elevator-buckets K. The material retained by each mantle I is, by the rotation of the same, carried to the larger part thereof, in which are the said elevator-buckets K attached to the partitions F. The inner parts of the said buckets K rest on a conical rim, L, attached to the partitions F, which partitions are also attached to the shaft C and the screens A, all the said parts revolving together. The material lifted from the interior of the mantles I by the elevater-buckets, when carried by the rotation of the buckets above the shaft C, falls upon the conoid rims L, and thence into the screens next farther from the hopper B, where the coarser parts of said material are separated, and the finer parts retained and passed along by the mantles I, buckets K, and conoid rims L, pertaining to the respective screens, until the terminal screen, or screens remotest from the hopper B, is reached; but instead of the buckets K spiral passages, leading from each mantle I to the interior of the next finer screen, may be used.

In place of a mantle, I, the screen farthest from said hopper has an exterior screen, T, Fig. 1, and the buckets K and conoid rim L, for carrying on the material farther, are omitted. In this last screen the coarsest material passes out of the annular passage E′ into the box H′. A finer grade passes through the screen A into the screen T, which passes through its meshes, a still finer grade into the box H″, while an intermediate grade of material is passed from the screen T through the annular passage E″ into the box H‴.

The apparatus, as shown in the drawing and herein described, is sufficient for the separation of five grades of material; but it may, of course, be extended to the separation of granular material into any number of different sizes by increasing the number of screens and properly proportioning the meshes thereof.

I claim—

1. The combination of two or more rotating screens of different fineness, arranged on a common axis, a mantle or mantles surrounding one or more of said screens, a channel or channels of communication between the mantle of each coarser screen and the interior of the next finer one, and a passage or passages leading from the interior of one or more of the screens out through the exterior of said mantle or mantles, substantially as and for the purpose specified.

2. The combination, with the rotating screens of different fineness, arranged upon a common shaft, as herein set forth, of the partitions F, the discharging-passages E, the mantles I, the buckets K, and the conoid rims L, substantially as and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of May, 1876.

MARTIN NEUERBURG.

Witnesses:
W. ROLIN,
ED. KÜHN.