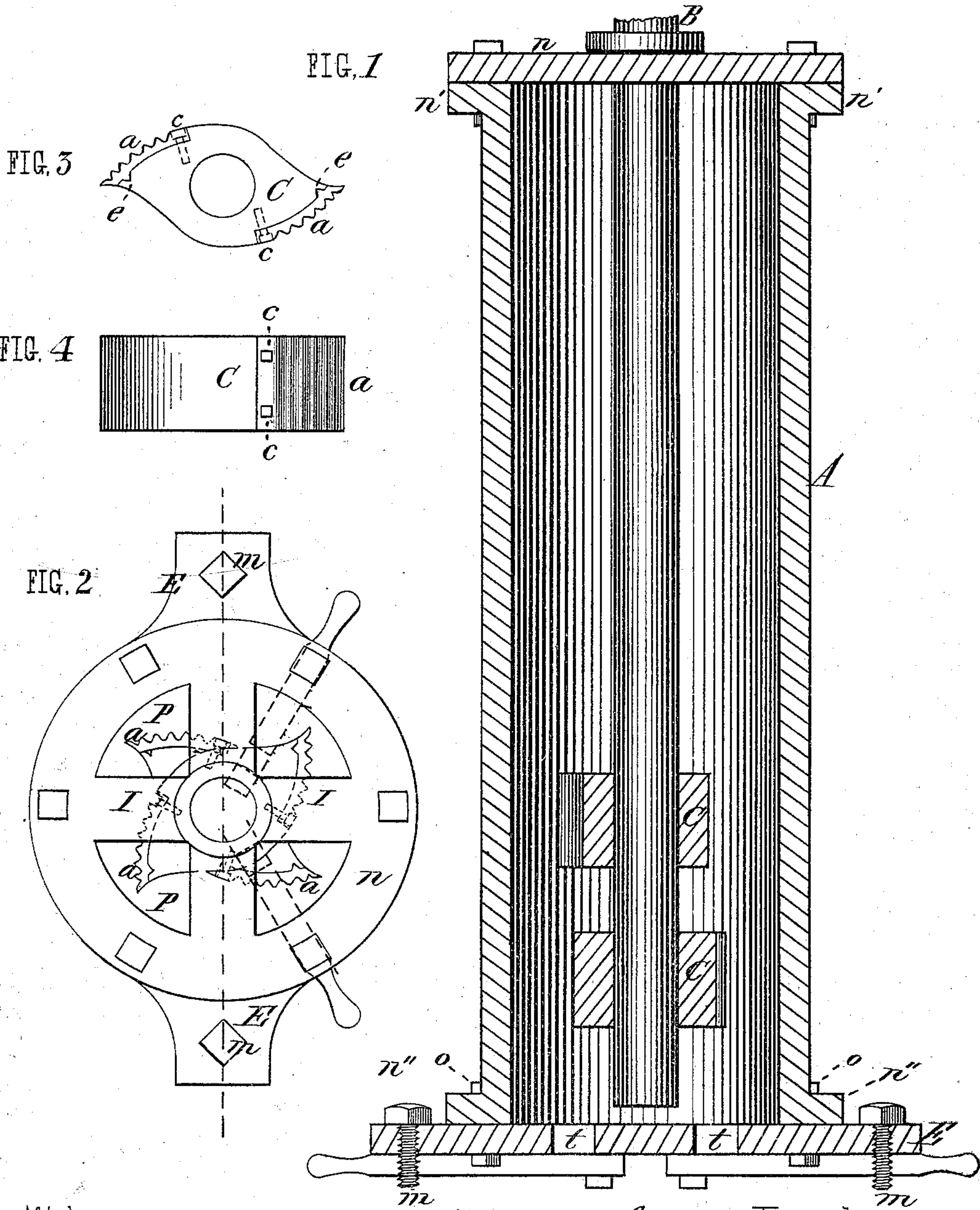


H. S. LUCAS.

Machines for Grinding Emery.

No. 135,482.

Patented Feb. 4, 1873.



Witnesses,
 Clarence E. Buckland- By J. Huntis,
 John P. Wall his atty-
 Herman S. Lucas. Inventor,

UNITED STATES PATENT OFFICE.

HEMAN S. LUCAS, OF CHESTER, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR GRINDING EMERY.

Specification forming part of Letters Patent No. 135,482, dated February 4, 1873.

To all whom it may concern:

Be it known that I, HEMAN S. LUCAS, of Chester, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Machines for Grinding Emery; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawing making part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a vertical section of the machine through its center. Fig. 2 is a plan view of the machine. Fig. 3 is a plan view of one of the grinding-cams, and Fig. 4 is a side view of the same.

My invention relates to a machine or device to be used for breaking up the ore and earthy matter with which emery is found and bringing it to a more or less powdered or granulated condition, so that said earthy and foreign matter may be easily separated from the pure emery, leaving the emery in a proper and fit condition for use; and the invention consists of a somewhat long cylindrical vessel in an upright position, in which, longitudinally, is placed a shaft, upon which and within the cylinder are secured cams or grinding pieces of metal, the extremities of which extend nearly to the inside surface or periphery of the cylinder; and, to make the grinding effect of said cams more thorough and perfect, I attach a corrugated shoe of steel or other hard metal to their ends, which also prevents a too rapid wearing away of the cams. Power is applied to a pulley attached to the shaft, and the ore, which is thrown in at the top, either through a hopper or otherwise, runs out, after being ground, through an aperture at the bottom of the cylinder, which may be closed with a sliding door when desirable.

That others skilled in the art may be able to make and use my invention, I will proceed to describe its construction and operation.

In the drawing, A is the cylinder, which may be of any diameter and length desired, and which is secured in an upright position by being bolted to the plate E by bolts *o* passing through the flange *n''* and plate E, said plate being firmly bolted to a timber or platform by the bolts *m*. A cap, *n*, is secured to the top

by bolts passing through said cap and into or through the flange *n'*, and a cross-bar, I, extends across the top, leaving apertures P each side thereof, through which to introduce the ore. A hole is made through the cross-bar I, and into this hole is inserted the shaft B, which extends down the center of cylinder A nearly to the bottom; and to this shaft are fixed two cams, C, which should be nearly at right angles to each other with reference to their length. One side of each cam, near the ends, is made convex, and to said convex part is attached a corrugated shoe, *a*, the corrugations upon each extending in a vertical direction, and the shoes are secured to the cams by means of the bolts *c*, a small lug, *e*, being made upon the inside of each shoe, if desirable, which fits into a corresponding depression in the cam as a further means of more firmly securing the shoe to the cam. A small door, which may be covered with a slide, *t'*, is made in the lower end of the cylinder, as shown at *t*, which may be opened to let out the emery as fast as it is properly prepared, and a pulley or bevel-gear may be secured to the shaft B, as a means of applying power to rotate the shaft.

The operation of the device is as follows: Power being applied to the shaft B, causing it to revolve, the ore is placed within the cylinder at the top, either through a hopper or otherwise, as the case may be; and, as the ore falls down to the cams C, which are placed upon the shaft near its lower end, as the cams revolve, the emery mixed with the earthy matter is forced between the corrugated shoe and the inside surface of the cylinder, and is crushed and ground against itself by being crowded into this space, and the particles or grains of emery are thus separated from the earthy and worthless matter; and, as it passes down and out at the aperture *t*, is ready to be separated into the proper grades of fineness for market.

I have found, by trial, that the cams may be used with a great degree of success without the corrugated shoe being attached thereto, and I therefore claim that the cams may be used either with or without the corrugated shoes attached without materially affecting the product of the machine; but I find that the corrugations catch the ore better, and that they hasten the separation of the emery from

the worthless matter to a great degree, accomplishing this result somewhat more rapidly than a smooth cam would do it; and the cams last much longer, for when a shoe becomes worn too much it may be removed and a new one supplied at much less expense than a cam.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination of the cylinder A, shaft B, and cams C either with or without the corrugated shoes *a* attached, all constructed and operating substantially as described.

HEMAN S. LUCAS.

Witnesses:

T. A. CURTIS,
CLARENCE E. BUCKLAND.