(No Model.) 3 Sheets—Sheet 1.

C. J. POTTER.

MILLSTONE.

No. 406,954. Patented July 16, 1889.

Fig. 1.

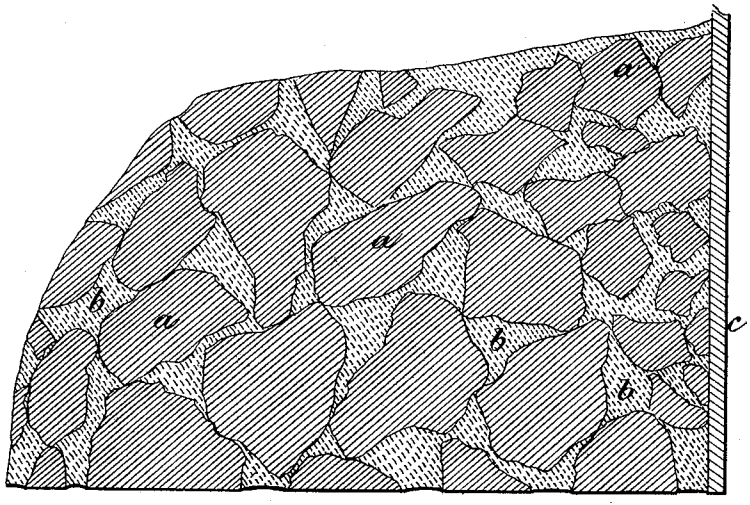
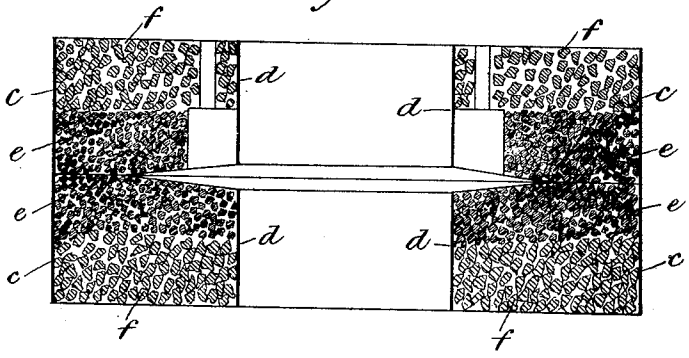


Fig. 2.



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Fig. 3.

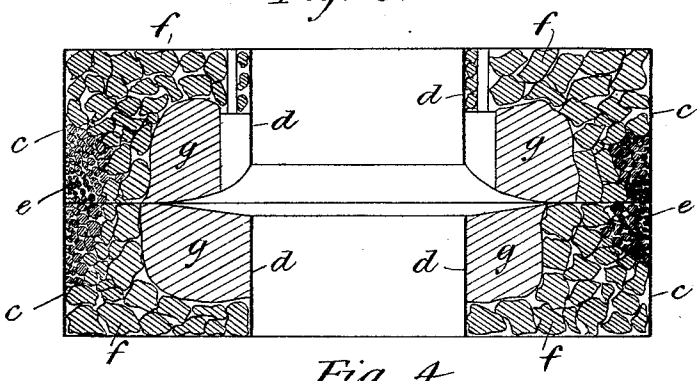
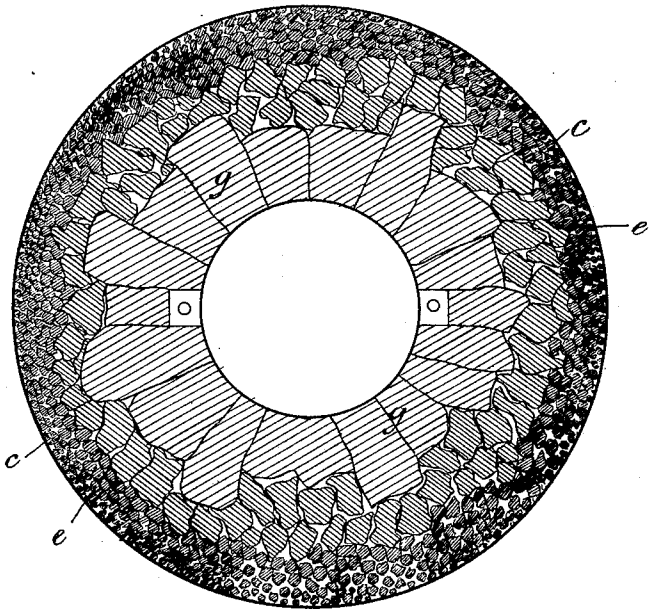


Fig. 4.



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Fig. 5.

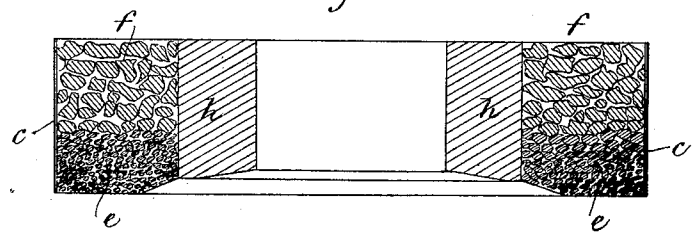
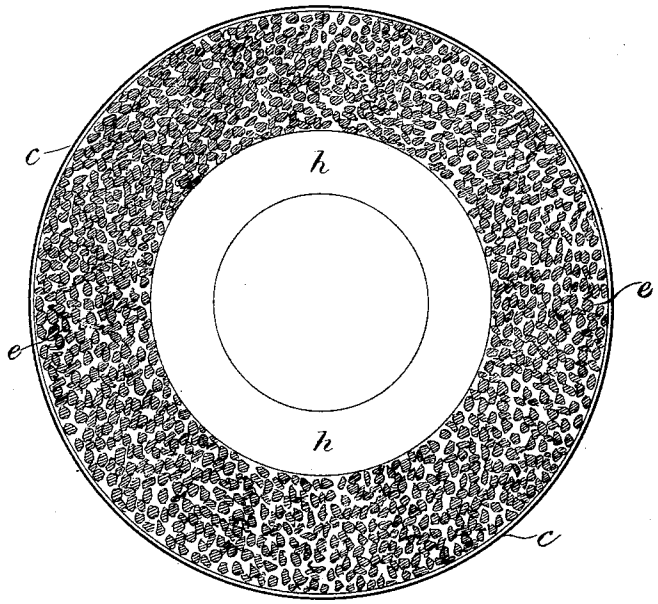


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES JOHN POTTER, OF HEATON HALL, NEWCASTLE, ENGLAND.

MILLSTONE.

SPECIFICATION forming part of Letters Patent No. 406,954, dated July 16, 1889.

Application filed July 10, 1888. Serial No. 279,536. (No model.) Patented in England November 2, 1887, No. 14,950.

To all whom it may concern:

Be it known that I, CHARLES JOHN POTTER, cement-manufacturer, a subject of the Queen of Great Britain, residing at Heaton Hall, Newcastle, England, have invented certain new and useful Improvements in Millstones, (for which I have received Letters Patent in Great Britain, No. 14,950, of November 2, 1887,) of which the following is a specification.

According to this invention, in place of building up millstones with pieces of "burr," as is now common, I construct them of lumps of emery cemented together, the emery being used in its native state and the lumps being of considerable size, say one-half an inch cube and upward. In making such stones I run concrete made of emery broken into lumps and cement into an annular metal mold, the bottom of which gives a smooth face to the stone. Above a layer of this emery concrete ordinary concrete may be added, so as to give additional weight. The cylindrical sides of the annular mold may be left attached to the block, so as to form the ordinary hooping. When such a stone is first used, the cement between the lumps of emery wears away more quickly than the emery, thus leaving shallow crevices between the lumps of the emery, thereby giving the necessary roughness to the face, which replaces the dressing of the burr-stones.

In the accompanying drawings, Figure 1 is a full-sized cross-section of part of the grinding-face of a millstone constructed according to my invention. Fig. 2 is a vertical section of a pair of stones to a smaller scale. Fig. 3 is a vertical section, and Fig. 4 is a plan, of a modified stone. Fig. 5 is a vertical section, and Fig. 6 is an under side view, of another modified stone.

The drawings do not show the machinery whereby the stones are supported and driven, as this may be of any ordinary construction.

In Fig. 1, *a* are lumps of emery, and *b* is the cement by which they are held together. I prefer to graduate the size of the lumps, having the largest toward the eye and the smallest at the periphery. If all the lumps were small, those toward the center are apt to be pulled out by any large pieces of the hard material to be ground, but if the lumps toward the eye are large they break up such pieces. *c* is the metal cylinder serving as a mold in the process of manufacture and as a hoop for the finished stone.

In Figs. 2 to 6, *c* is the outer cylinder, as before. *d* is the inner cylinder. *e* is the emery concrete; *f*, concrete of ordinary stone.

In Figs. 3 and 4, *g* is an inner ring of burr or other suitable stone. This arrangement is useful for rough grinding, as the burr is more suitable than emery for reducing any large pieces which may be put in to a size convenient for grinding by the emery face.

In Figs. 5 and 6, *h* is an inner ring of sand stone or ordinary cement concrete, which acts merely as a filling, the grinding being performed by the emery surfaces. This arrangement is suitable for fine grinding.

By the use of lumps of emery as distinguished from grains, and by isolating them from each other in the mass of cement and distributing them throughout it, I am enabled to obtain a millstone having a self-renewing face presenting "lands," and also furrows continuous from eye to skirt, for the escape of the reduced material.

What I claim is—

1. A millstone consisting of the combination of small irregular lumps of emery having spaces or interstices intervening between their edges, and cement interposed between the lumps and filling said spaces or interstices, said millstone presenting on its working-face alternate portions of stone and cement, substantially as and for the purpose specified.

2. A millstone built up of lumps of emery cemented together, the size of the lumps decreasing from the center outward, substantially as described.

3. A millstone consisting of the combination of lumps of emery separated from each other, as described, leaving spaces or interstices intervening between their edges, Portland cement interposed between the lumps and filling the spaces, and an inclosing metallic cylinder, substantially as described.

4. A millstone having an interior ring or burr of solid stone and an outer ring filled up with small irregular lumps of emery, and cement interposed between the lumps, substantially as described.

CHARLES JOHN POTTER.

Witnesses:
GEORGE STEPHENSON POTTER,
EDWARD DAVIDSON COOKE.