(No Model.) 2 Sheets—Sheet 1.

T. L. STURTEVANT.

ART OF MAKING COMPOSITE MILLSTONES.

No. 483,179. Patented Sept. 27, 1892.

Fig. 4.

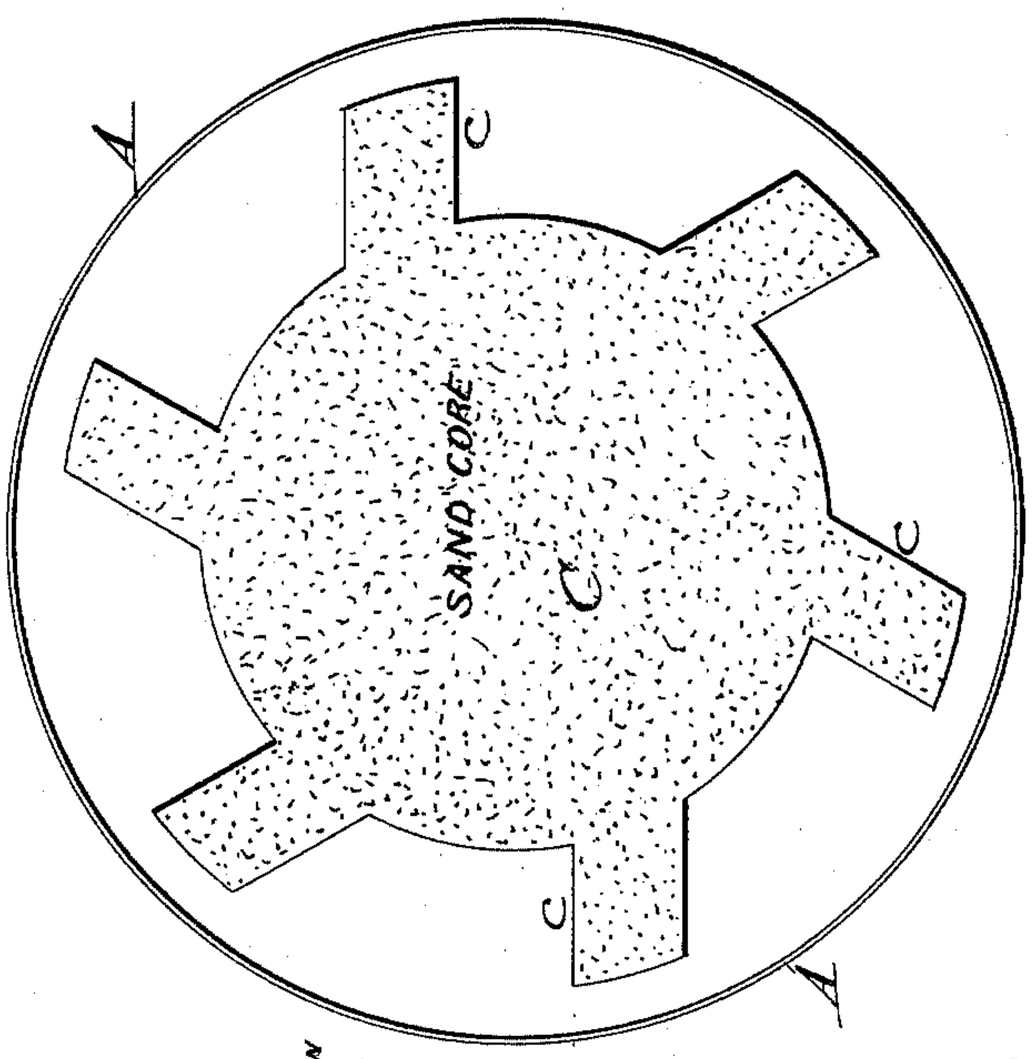


Fig. 5.

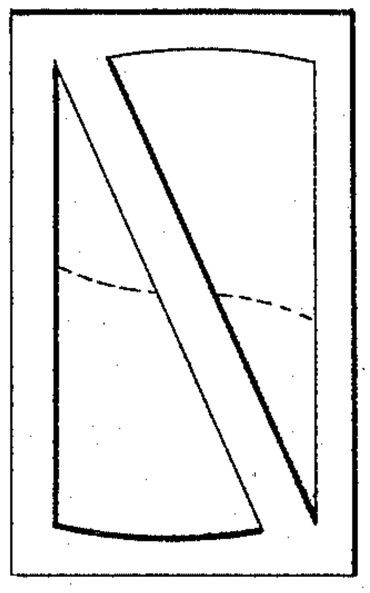


Fig. 1

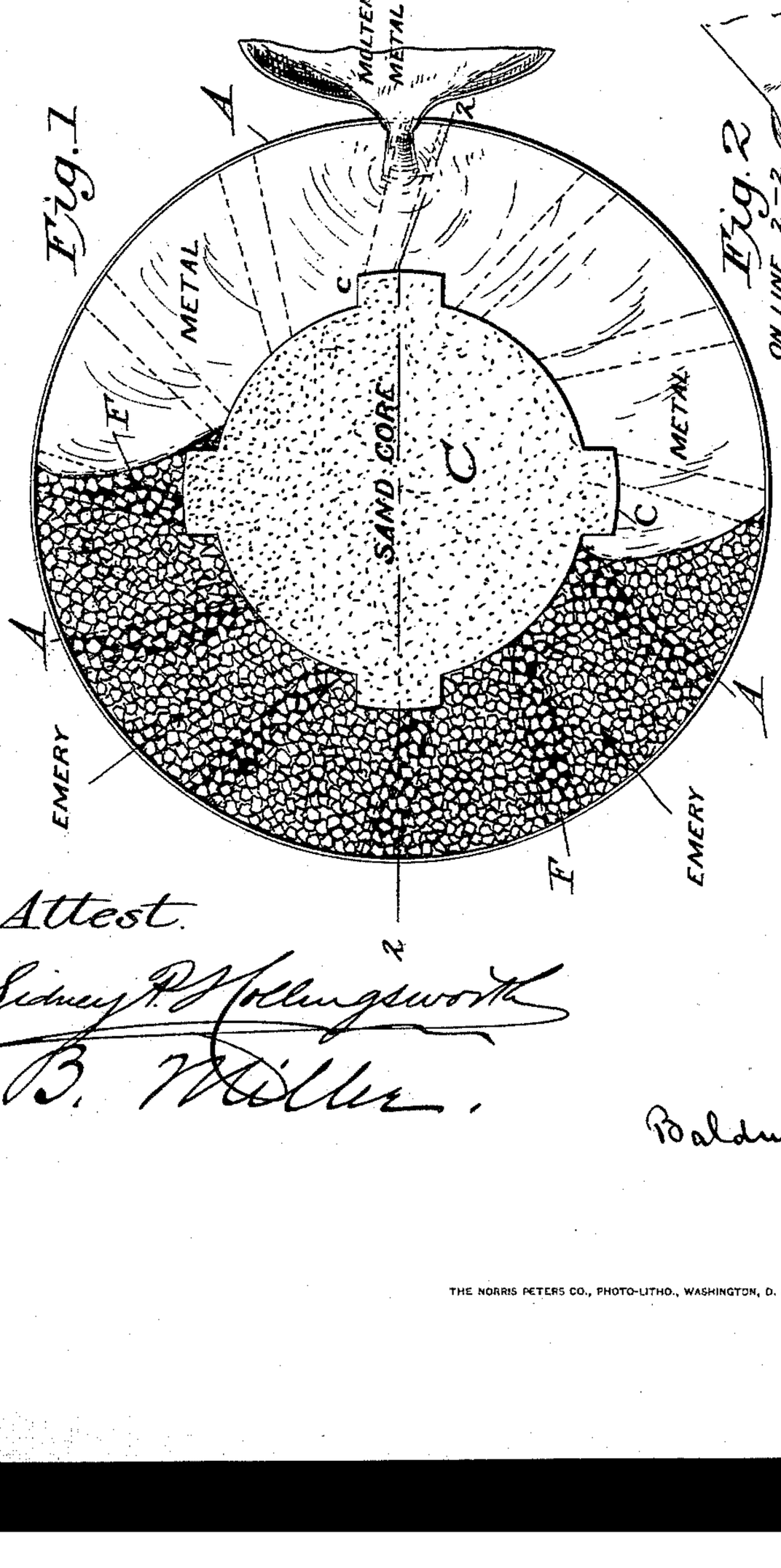


Fig. 2

ON LINE 2—2

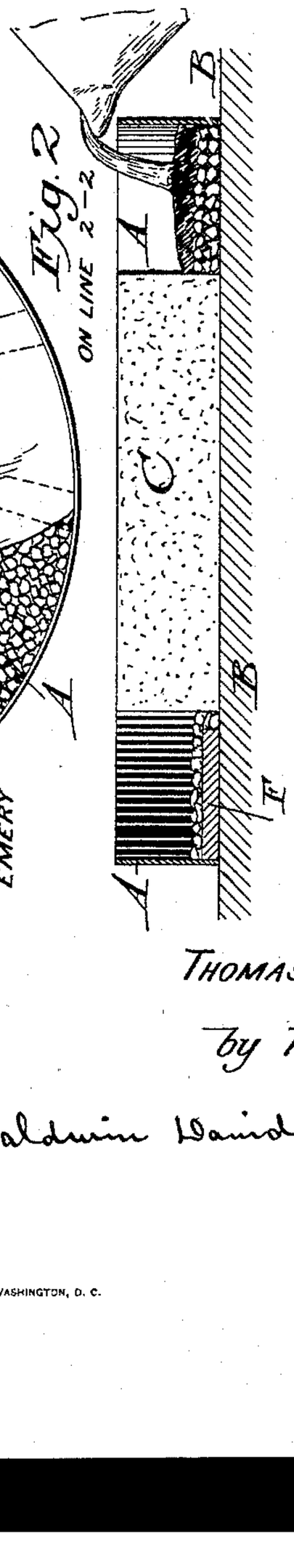
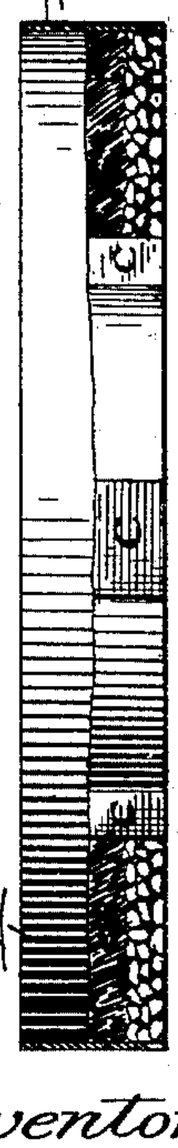


Fig. 3.



Attest.

Sidney P. Hollingsworth

B. Wilder.

Inventor

THOMAS L. STURTEVANT

by his attorneys

Baldwin Davidson & Wright

(No Model.) 2 Sheets—Sheet 2.

T. L. STURTEVANT.

ART OF MAKING COMPOSITE MILLSTONES.

No. 483,179. Patented Sept. 27, 1892.

Fig. 7.

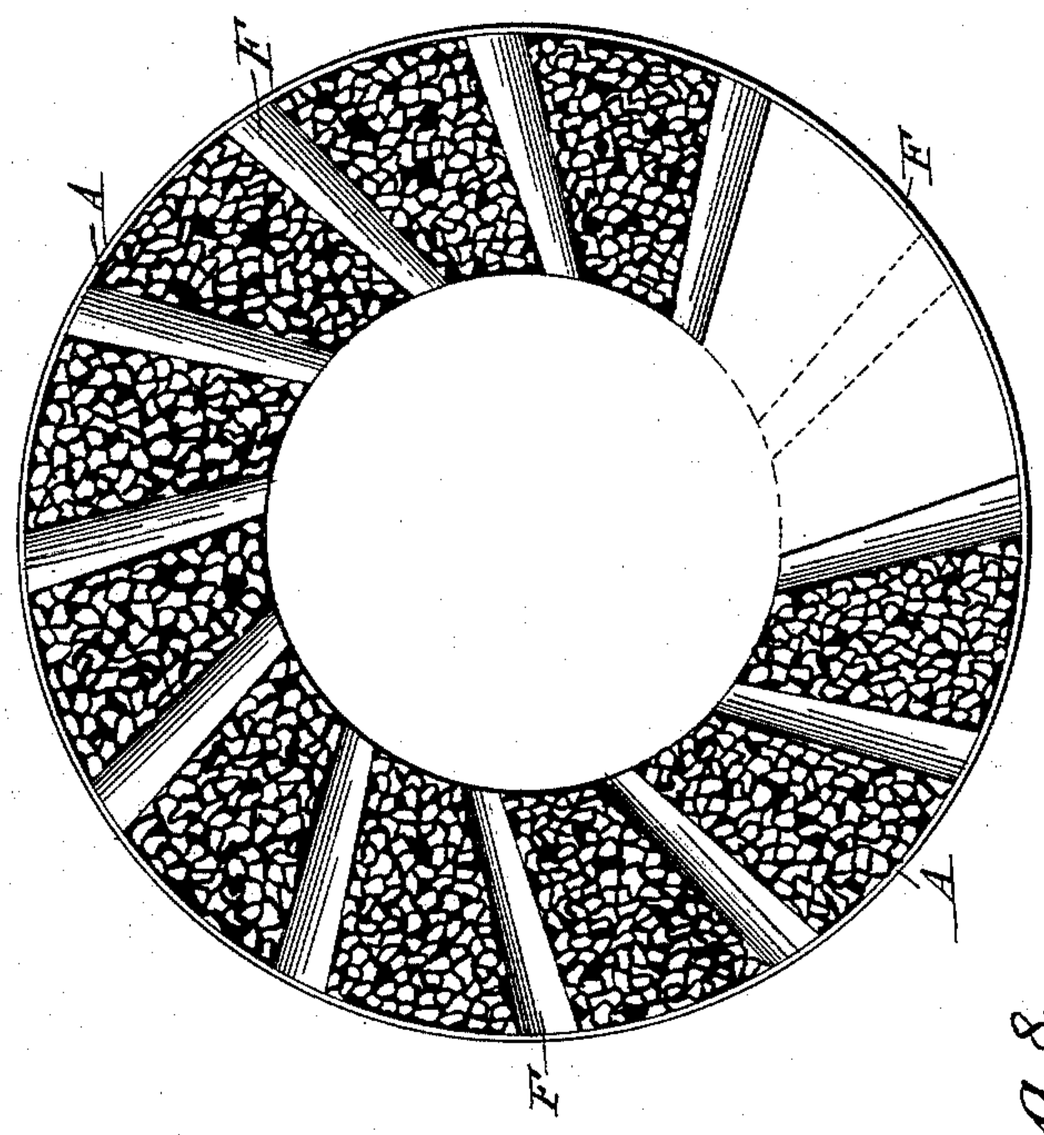


Fig. 9.

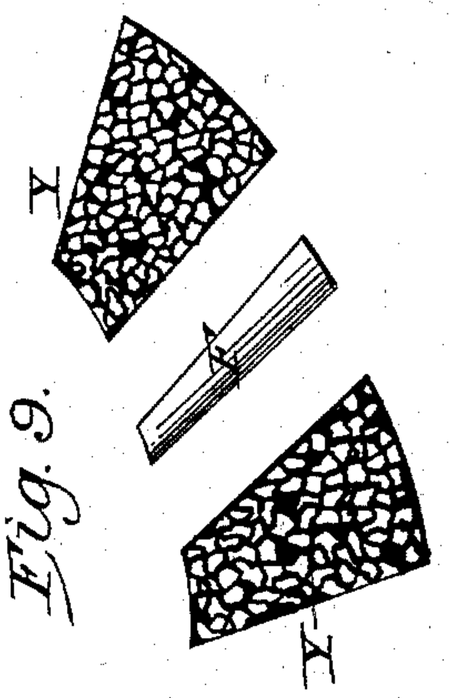


Fig. 8.

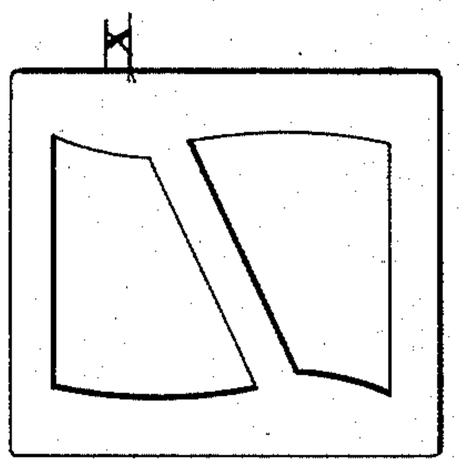


Fig. 6.

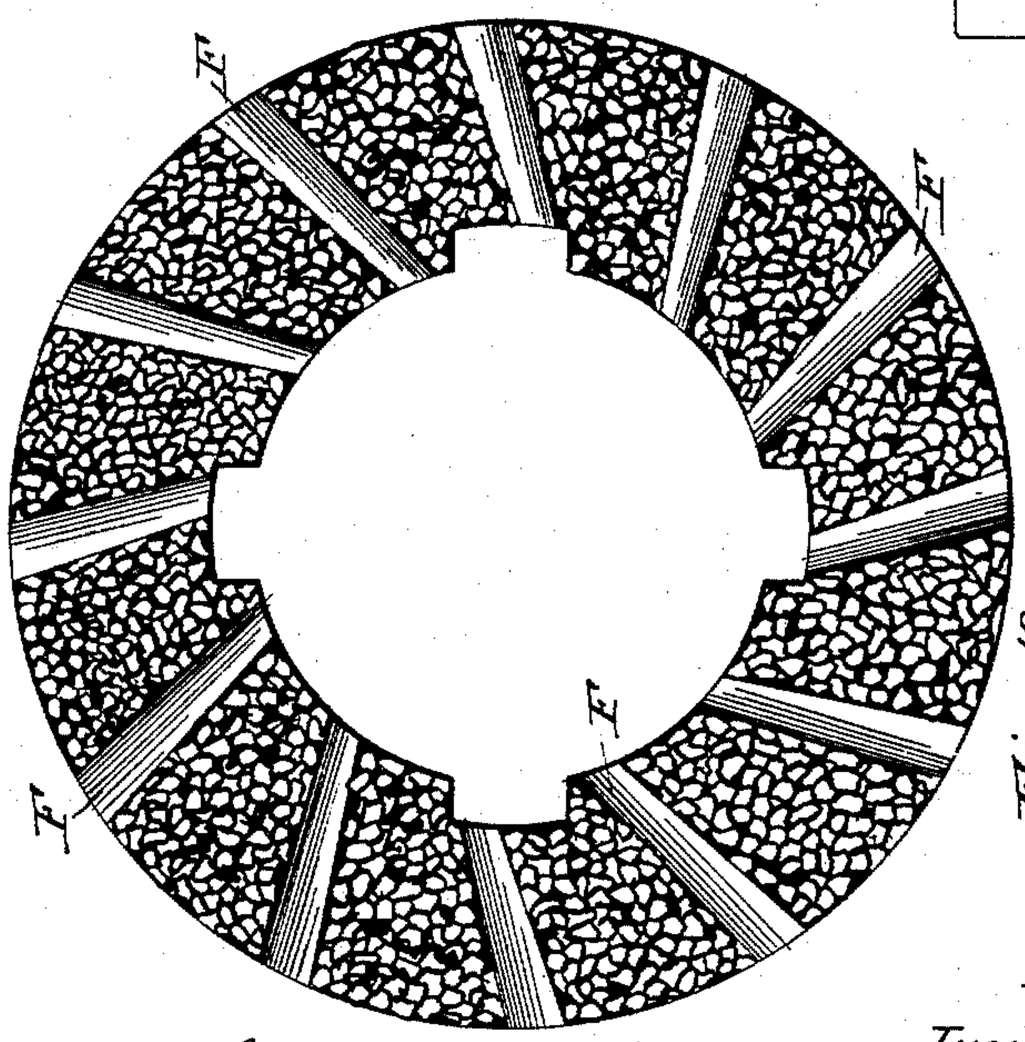
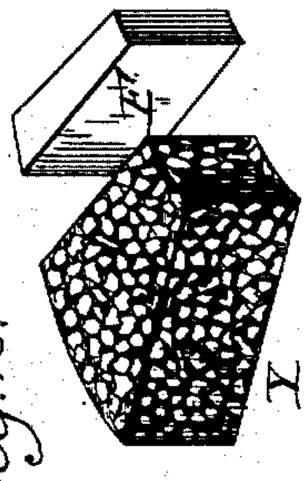


Fig. 10.



Witnesses;

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by his attorneys,

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UNITED STATES PATENT OFFICE.

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ART OF MAKING COMPOSITE MILLSTONES.

SPECIFICATION forming part of Letters Patent No. 483,179, dated September 27, 1892.

Application filed September 29, 1890. Serial No. 366,564. (No model.)

To all whom it may concern:

Be it known that I, THOMAS L. STURTEVANT, a citizen of the United States, residing at Framingham, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in the Art of Making Composite Millstones, of which the following is a specification.

My invention relates to the manufacture of composite millstones made up of small irregular lumps of emery united by a binding material. A millstone of this character is shown in Letters Patent of the United States No. 406,954, granted to C. J. Potter July 16, 1889. By the use of lumps of emery as distinguished from grains of very large blocks and by isolating the lumps from each other in a mass of binding material and distributing them throughout it the millstone is made to have a self-renewing face, presenting lands and also furrows continuous from eye to skirt for the escape of the reduced material. The Potter patent above referred to suggests only the use of cement, such as Portland cement. Millstones made in this way are well adapted for certain classes of work or on certain materials; but for some classes of grinding it is not entirely satisfactory, as the pieces of emery more or less frequently are detached. It is therefore of the utmost importance that a binding material should be employed which shall hold the lumps of emery firmly at all times. I therefore employ metal as the binding material, and in carrying out my invention I preferably fill a mold with small lumps of emery, then pour into the mold and into the interstices between the lumps molten metal, and thus form the working face of the stone. I may form the skirt of the stone in sections or in one continuous piece. The stone in other respects may be formed in any desired way. I preferably employ furrow-strips extending from eye to skirt, which may be suitably and readily dressed.

The accompanying drawings illustrate the method and one form of an apparatus for carrying out my invention.

Figure 1 represents a plan view of the mold in which the stone is formed. It shows on the left-hand side the lumps of emery in the mold and on the right-hand side the metal being poured into the mold. Fig. 2 is a vertical section on the line 2 2 of Fig. 1. Fig. 3 is a similar section of the stone partially completed. Fig. 4 represents a plan view of the mold and sand core for making a stone with tangential arms. Fig. 5 is a plan view of a mold for casting sections of which the skirt of the stone may be constructed. Fig. 6 is a top plan view of the skirt manufactured according to the plan illustrated in Fig. 1. Fig. 7 is a top plan view of the skirt of a millstone constructed of segmental sections, two of the sections being removed. Fig. 8 is a plan view illustrating the shape of the mold in which the segments are formed. Fig. 9 is a plan view of two of the sections and one of the furrow-strips employed in making the stone shown in Fig. 7, and Fig. 10 is a perspective view of one of the skirt-sections and one of the furrow-strips.

I do not limit myself to the kind of metal employed, but specify cast-iron as one of the metals which may be employed.

In carrying out my invention to form a stone such as illustrated in Fig. 1 I place a circular hoop or band A, of metal, preferably iron, on a flat plate B, of similar metal. A dry sand core C is placed on the plate B concentrically with the band A, and the space between the core and band is filled in with lumps or fragments of emery of the desired size to the depth the stone is designed to wear. The lumps or fragments are then packed or gently rammed, in order to bring the lumps into the desired relation. Molten metal—such as iron—is then poured over the emery, filling the interstices or spaces between the fragments and covering the surface to a suitable depth. The iron in cooling contracts, thus filling all the interstices and holding each fragment of emery firmly grasped. The emery and iron next the plate B form the grinding-face of the stone. The sand core is then removed, leaving a space into which a burr-stone or esopus-stone may be inserted to form the eye. The emery and iron need not necessarily be the full thickness of the band, but the space above them may be filled with a backing of cement or other heavy material.

The sand core Fig. 1 is adapted to form radial recesses *c* in the skirt of the stone,

while that shown in Fig. 4 is adapted to form recesses tangential to the eye. Fig. 5 shows a mold of a form adapted to cast sections from which to construct the skirt of the stone.

As it is desirable to form furrows from the periphery of the skirt to the eye, and as the emery is so hard that practically it cannot be dressed or cut by any stone, I insert furrow-strips F in the stone during its process of manufacture.

As shown in Fig. 2, the furrow-strip F is placed on the plate B before the metal is poured in, and the pieces of emery are packed around it. After the metal is poured in the lumps of emery are securely fastened together, and the furrow-strips are also firmly held in place. Where sector-shaped sections are used to form the skirt, the furrow-strips may be interposed between them. When such sections are used, they may be bound together by means of a metal band A or other suitable fastening extending around the periphery of the skirt.

Instead of making the skirt in one continuous piece, as illustrated in Fig. 1, I may form it of sections, as illustrated in Fig. 7. A suitable mold X, such as indicated in Fig. 8, is employed. The lumps of emery are first arranged in the mold, and the molten metal is poured in until the emery and metal are firmly united and the sections Y take the form illustrated in Figs. 9 and 10. Furrow-strips F are placed alternately with the sections, as indicated in Fig. 7, and a band A is employed to hold the furrow-strips and sections in place. Any suitable eye may be employed, and the band will hold the furrow-strips and skirt-sections in place on the eye.

I claim as my invention—

1. The herein-described improvement in the art of making millstones, which consists in forming a number of segments for the skirt of small irregular lumps of emery and molten metal, arranging the segments around an eye, and securing them thereto.

2. The herein-described improvement in the art of making millstones, which consists in forming a number of segments by binding together small irregular lumps of emery with molten metal, arranging the segments with furrow-strips around an eye, and securing them thereto.

3. The herein-described improvement in the art of making millstones, which consists in forming the skirt of the stone by arranging at suitable distances apart furrow-strips, arranging small irregular lumps of emery between the furrow-strips, then pouring molten metal over the furrow-strips and the lumps of emery, and then securing the skirt thus formed to the eye.

In testimony whereof I have hereunto subscribed my name.

THOMAS L. STURTEVANT.

Witnesses:
W. H. ELLIS,
F. E. CLEARY.