

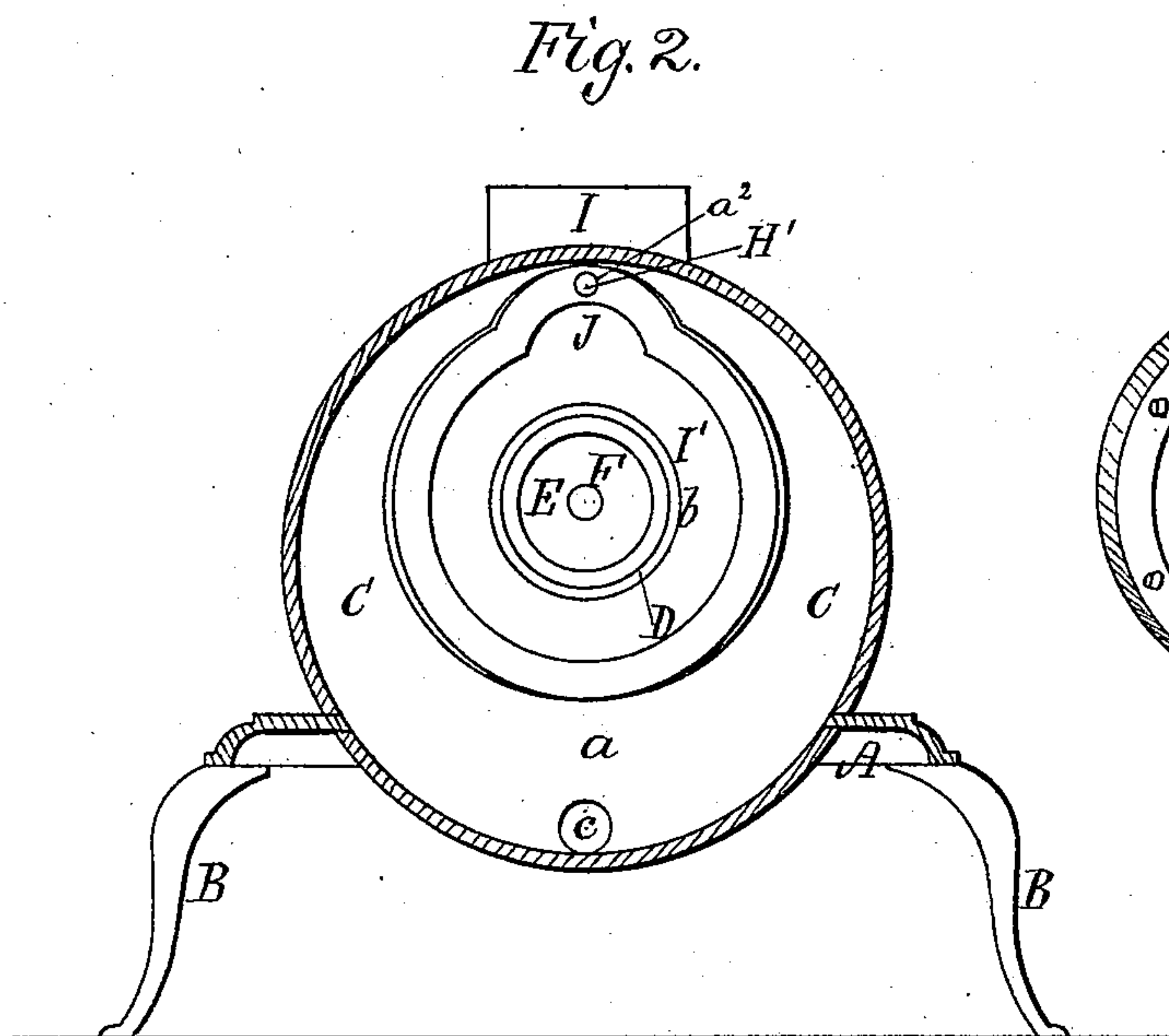
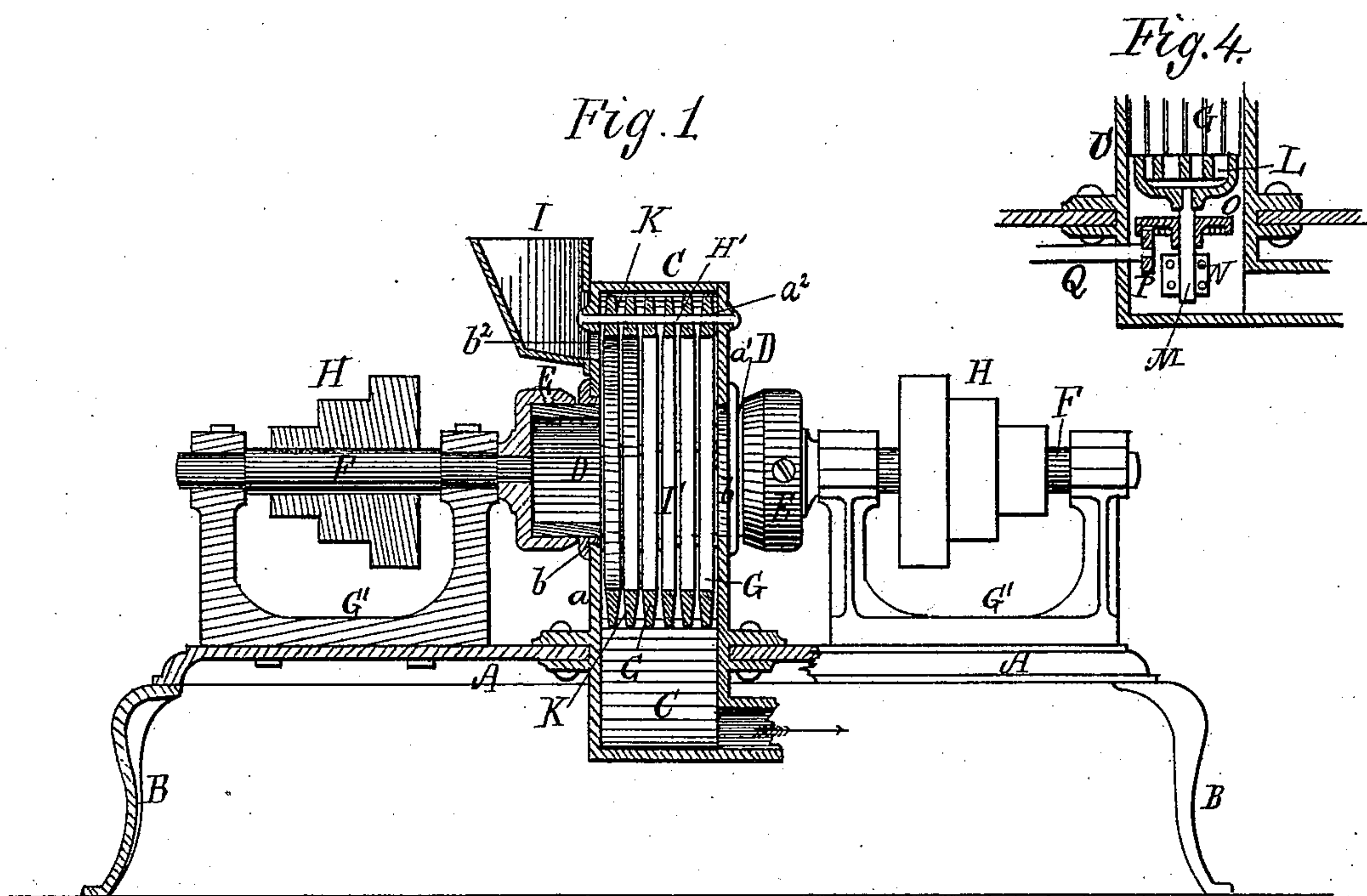
(No Model.)

T. L. STURTEVANT.

ATTRITION MILL.

No. 291,954.

Patented Jan. 15, 1884.



Witnesses.
H. C. Lodge
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UNITED STATES PATENT OFFICE.

THOMAS LEGGETT STURTEVANT, OF FRAMINGHAM, MASSACHUSETTS.

ATTRITION-MILL.

SPECIFICATION forming part of Letters Patent No. 291,954, dated January 15, 1884.

Application filed May 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, THOMAS LEGGETT 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 Attrition-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

These improvements relate to a class of attrition-mills shown and described in Letters Patent of the United States issued to myself on the 28th day of March, 1882, in which the material to be ground is reduced by attrition between its own particles, rather than by direct mechanical action of the mill, the material to be reduced supplying its own grinding-surfaces, while the commotion or disturbance among its particles is effected by the rotary portion of the mill, the latter being, to a great extent, relieved from wear, as the active operation of grinding is transferred from it to the material.

The drawings accompanying this specification represent, in Figures 1 and 2, vertical sections of a mill containing my improvement, the former being longitudinal and the latter transverse. Fig. 3 represents an isometric elevation of one of the sifting-rings, to be explained. Fig. 4 is a view of the grate, to be explained.

In these drawings, A represents the base-plate of the mill, supported on legs B, and having two pairs of standards, G', raised upon it near its respective ends. Each pair of standards affords bearings for a horizontal shaft, F. Each of these shafts is provided with a belt-pulley, H, whereby it is turned, and has at its inner end a cap, E, which receives a cylindrical head, D. These two heads D are, on opposite sides of a case, C, bolted to base-plate A, the interior of said case having communication with their interiors by suitable openings in its sides.

I designate a hopper, which is secured to the upper part of said case, and supplies the

interior thereof with the grain or other material which is to be ground. The side openings of said case are provided with annular bushings b, which surround the heads D and prevent escape of grain or flour or meal around said heads. The grinding is effected, as stated, by the rotation of the grain in the hollow heads, while that in the case remains stationary, the two masses of grain being in contact. As I have described this method in a previous patent, there is no need to more elaborately explain it here. The meal or flour produced by this grinding passes down into the lower part of case C, and thence out through a suitable passage to any proper receptacle. Above the throat b' of the hopper I a rod, H', extends across the case C. On this rod are hung a number of rings, G, each of which is perforated at top to form a hole, a', which receives said rod. These rings extend down below the heads D, so that the grinding takes place in the chamber I', which said rings inclose, and the lower part of said rings act as a screen for the meal, flour, or powder thus produced. These rings are beveled, so as to have a tapering form in cross-section, as indicated by letter K. To economize space in said grinding-chamber I', inclosed by said rings, and provide free entrance thereto of the material to be ground, I form a recess, J, in the upper part of each ring, on the inner side thereof and just below rod H'. A certain portion of the mass in the chamber I' remains practically stationary, while another portion, put in rotation by the head D, moves upon the first, the attrition between the two resulting in a rapid and continuous grinding of the material. Owing to the disturbance among the particles of the mass within the chamber I', due to the rotation of the head D, the rings G G, &c., swing more or less upon or past one another upon their support, which tends to prevent clogging of the flour between them and provides a very effective screen. The said rings are to be placed at such distance apart as is requisite to produce the required fineness of powder. The powder, as it reaches the requisite degree of fineness, escapes between the rings and is drawn from the case by a suction-fan or other device. To aid in the free escape of the powder between the rings, I reduce the thickness

of each ring outwardly, as shown at K, thereby gradually increasing the width of the spaces between the various rings. As before stated, the extent of the spaces separating the rings
 5 determines the degree of fineness of the powder which escapes by them; hence increasing these spaces produces a coarser powder, and vice versa. These rings are simple, efficient, and durable.

10 In the reduction of some kinds of material the powder tends to lodge in the lower part of the chamber I' and clog between the rings G. To avoid this I cut away the lower portions of these rings centrally of the chamber I', to receive a horizontal rotary grate, L, which is
 15 secured to the upper end of a vertical shaft, M, mounted in bearings N, secured to one side of the interior of the case C, the grate being rotated by means of a gear, O, secured to the
 20 shaft M, and engaging and being driven by a pinion, P, secured to the inner end of a horizontal shaft, Q, mounted in bearings secured to the case. The rotary grate effectually prevents clogging of material in the lower part of
 25 the chamber T and insures a free and rapid extraction of the powder.

I have described the rings as suspended at top from a pivot; but it is not essential or necessary to my invention that they should be
 30 thus suspended at the top at any point. They may have trunnions upon opposite edges to rest upon ledges cast in the case; or they may be supported by a cross-bar, upon which they swing independently of each other; or they
 35 may rest at bottom upon a bar spanning the lower part of the case. I consider my inven-

tion to consist, so far as the grate is concerned, in a grate composed of a series of rings arranged side by side, substantially as explained.

I claim—

1. A case and a series of rings contained therein, which act as a screen, in combination with a rotary hollow head adapted to communicate with said case within the space inclosed by the screen, and means for supplying
 40 said case and head with grain or other material within the space or chamber inclosed by said rings, in order that the material may grind itself, substantially as set forth.

2. The rings G, in combination with head or heads D, case C, and suitable means for supporting said rings independently of each other, substantially as described.

3. In an attrition-mill, the rings G, constituting a screen therefor, each ring being provided with a recess, J, under its point of suspension, substantially as set forth.

4. The rotary grate L, in combination with the rings G and case C, substantially as explained.

5. In attrition-mills, a grate composed of a series of rings, in combination with a vertical shaft, on which said grate is mounted, and means for rotating said shaft and grate, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

THOMAS LEGGETT STURTEVANT.

Witnesses:

F. CURTIS,
 W. WINCH.