

G. E. SHERWIN.  
Crushing and Pulverizing Machine.

No. 204,849.

Patented June 11, 1878.

Fig. 2.

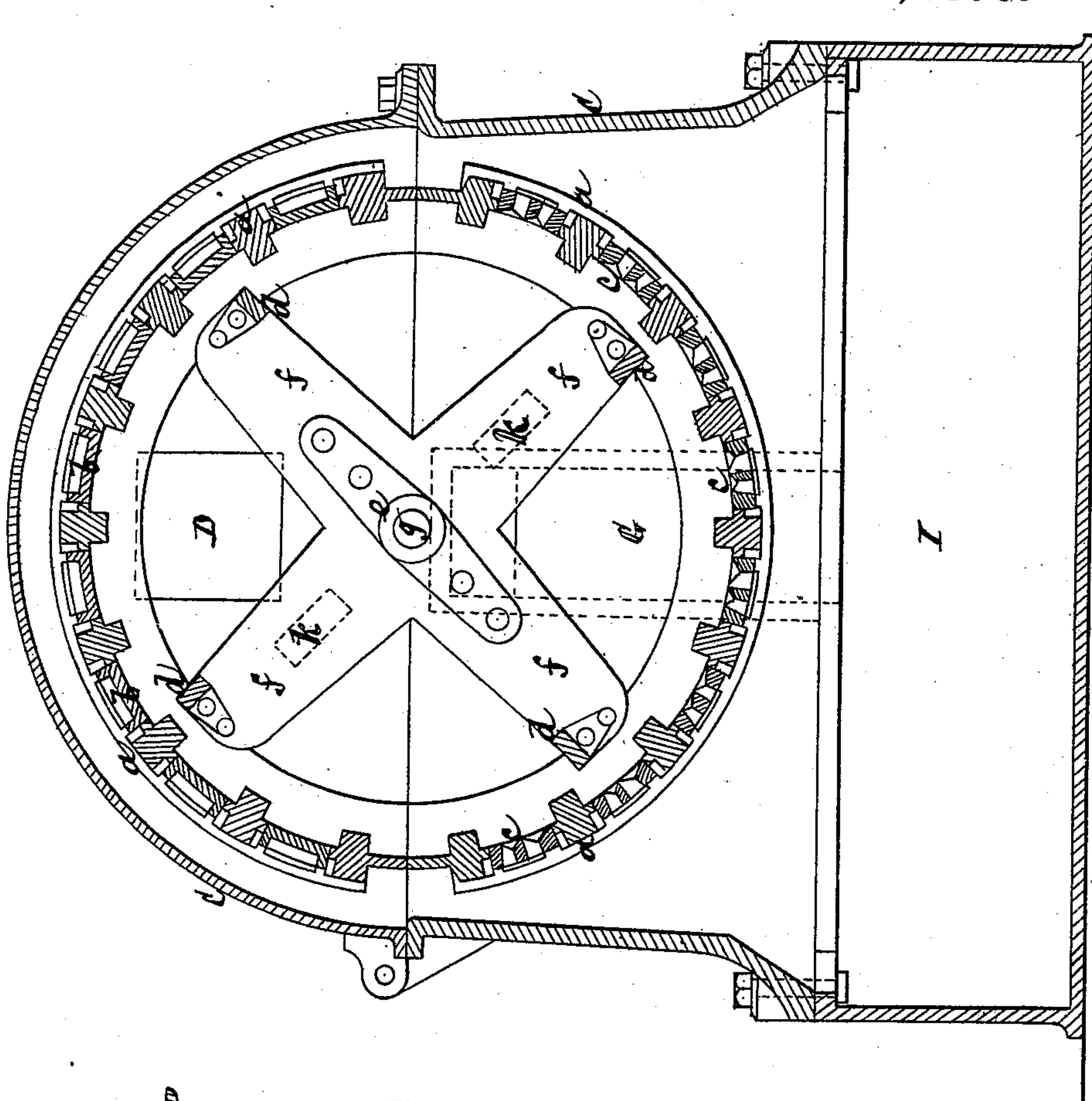
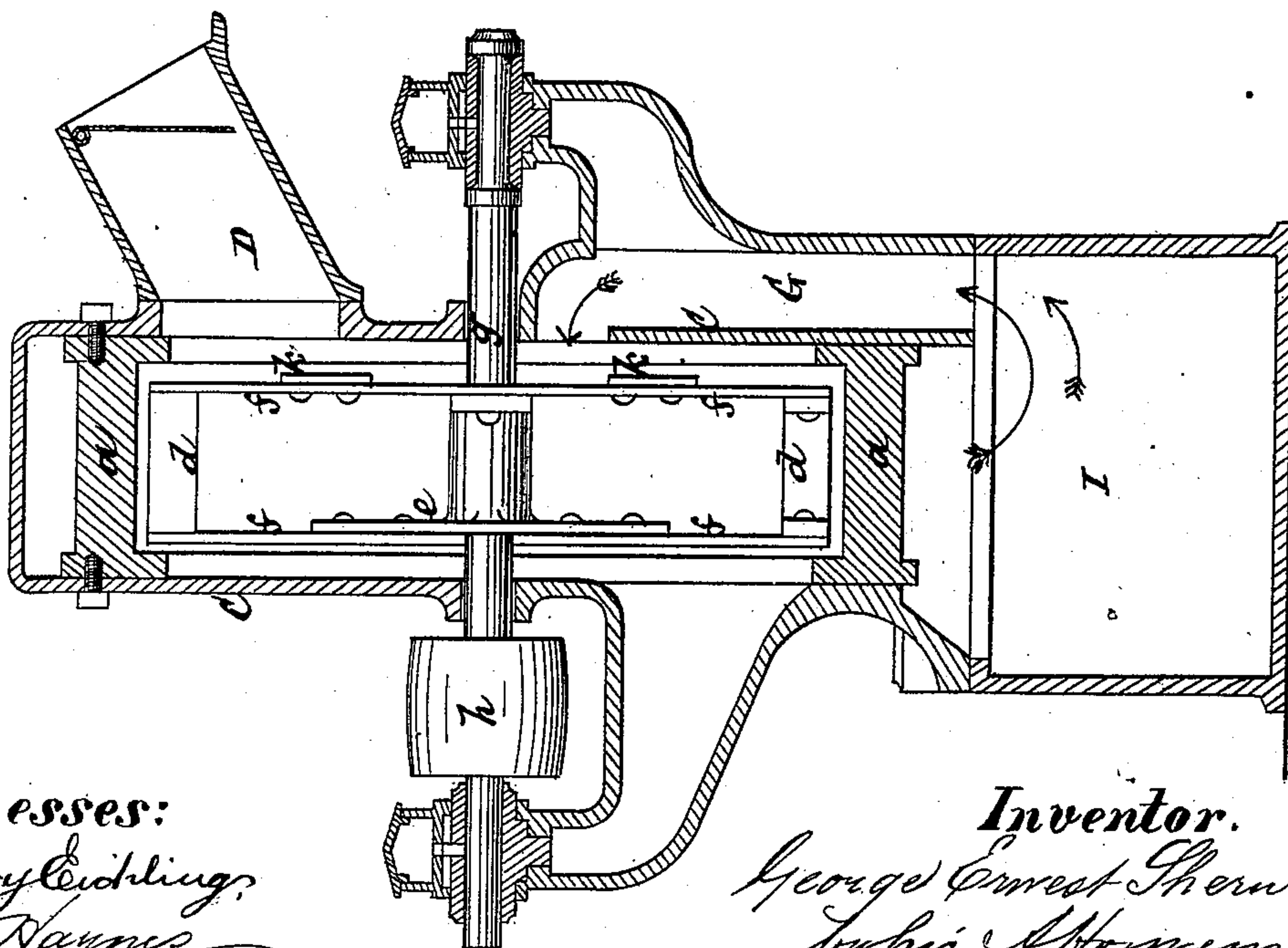


Fig. 1.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN CRUSHING AND PULVERIZING MACHINES.

Specification forming part of Letters Patent No. 204,849, dated June 11, 1878; application filed March 20, 1878.

*To all whom it may concern:*

Be it known that I, GEORGE ERNEST SHERWIN, of Hackney, in the county of Middlesex, England, engineer, have invented an Improved Machine for Crushing, Disintegrating, Grinding, or Pulverizing all kinds of Animal, Vegetable, and Mineral Substances, also for mixing or screening and sifting the same, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings.

The principle on which the reduction of the material depends is the clashing about of the same within a drum or casing by means of several steel or other suitable metal pieces, termed "beaters," revolving around one center, which beaters continually throw the material against a serrated or notched periphery until sufficiently reduced to pass through the screens provided for the purpose.

I construct my improved machine in the following manner, reference being made to the drawing, Figures 1 and 2: *a* is a serrated or notched periphery, which I term "segment," extending entirely around the circumference, and fitting closely to the sides of the casing in which it is contained. Between the notches or teeth of this segment I place screens *c* or sieves of suitable form. These screens are fitted in separately, so as to allow of their ready renewal if broken, and in some cases part of the circumference is filled up with blanks *b*. The segments *a a* are made in two halves, the top half being firmly secured to the top half of the casing *C*. The bottom half of segment is secured to the bottom half of casing. The casing formed by the segments *a a* are secured in an exterior tight casing, *C*, formed in two parts, hinged together at one side and provided with flanges at the other, which may be temporarily secured by screw-bolts or otherwise, to allow the two parts to be opened when desired. The upper part of the casing *C* is provided with a chute, *D*, through which the ore may be fed in, and the lower part with a chamber, *I*, for the reception of the pulverized ore, from which extends a flue, *G*, to the center of the casing, for the

purpose of returning the blast to the center of the casing formed by the segments.

Within the chamber formed by the serrated or notched periphery *a* and the sides of the casing I place several steel or other metal pieces, termed "beaters," *d*. I attach these beaters at each end to disks, rings, plates, or series of arms, according to the nature of the material to be operated upon. When it is desired to feed large pieces of the material to be ground into the machine, I place the beaters *d* between two series of arms, *f f*, and attach to each. On the outside of the arms, nearest the feed-hopper *D*, I place side beaters *k*, which break up the material as it enters the mill or machine. In this way any size of the material to be ground may be fed into the machine, and so long as it is not too large for the feed-hopper it will be ground, thus dispensing with preliminary crushing or breaking.

The two series of arms *f f* are each attached to a boss, *e*, which, in its turn, is keyed to the spindle *g*. The driving-pulley *h* is also keyed to this spindle. Suitable bearings are provided to carry the spindle *g* at each end.

In order that the blast or current of air created by the rapidly-revolving beaters may not become a nuisance in the place or building wherein the machine is being worked, I return it again directly into the machine at or near its center, through a return air-pipe, *G*, provided especially for that purpose, (and not through the hopper,) into the machine.

The following is the mode of working the machine: The material to be reduced is fed into the machine through the feed-hopper *D*, provided in the side thereof. As soon as it reaches the side beaters *k* it is broken and thrown into the beating-chamber, where it is still further reduced by the beaters *d* dashing it against the serrated periphery *a* until sufficiently fine to pass through the screens *c*. A clear space is left all around the serrated periphery between it and the casing of machine, to allow a free passage for the material.

After the ground material leaves the machine it falls or is led into a chamber or other suitable receptacle, *I*, and the current of air

created by the revolving beaters is conducted again into the machine at its center or near thereto.

I claim—

1. The combination of the rotating beaters within the cylindrical shell, provided with alternate serrations and screens, and the exterior casing inclosing the whole, substantially as specified.

2. The cylindrical shell provided with serrations and having the movable blanks *b* and sieve-sections *c*, substantially as and for the purposes specified.

3. In an ore-crushing machine, the combi-

nation, with the rotating arms and the cylindrical shell in which they revolve and the sieves thereof, of an outer casing provided with a return-flue leading to the center of the cylindrical shell, whereby the blast of air created by the beaters is returned to the center of the shell, substantially as and for the purposes set forth.

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Witnesses:

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