

No. 611,867.

Patented Oct. 4, 1898.

J. PÖTTGENS.  
GRINDING AND PULVERIZING MACHINE.

(Application filed Aug. 5, 1897.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

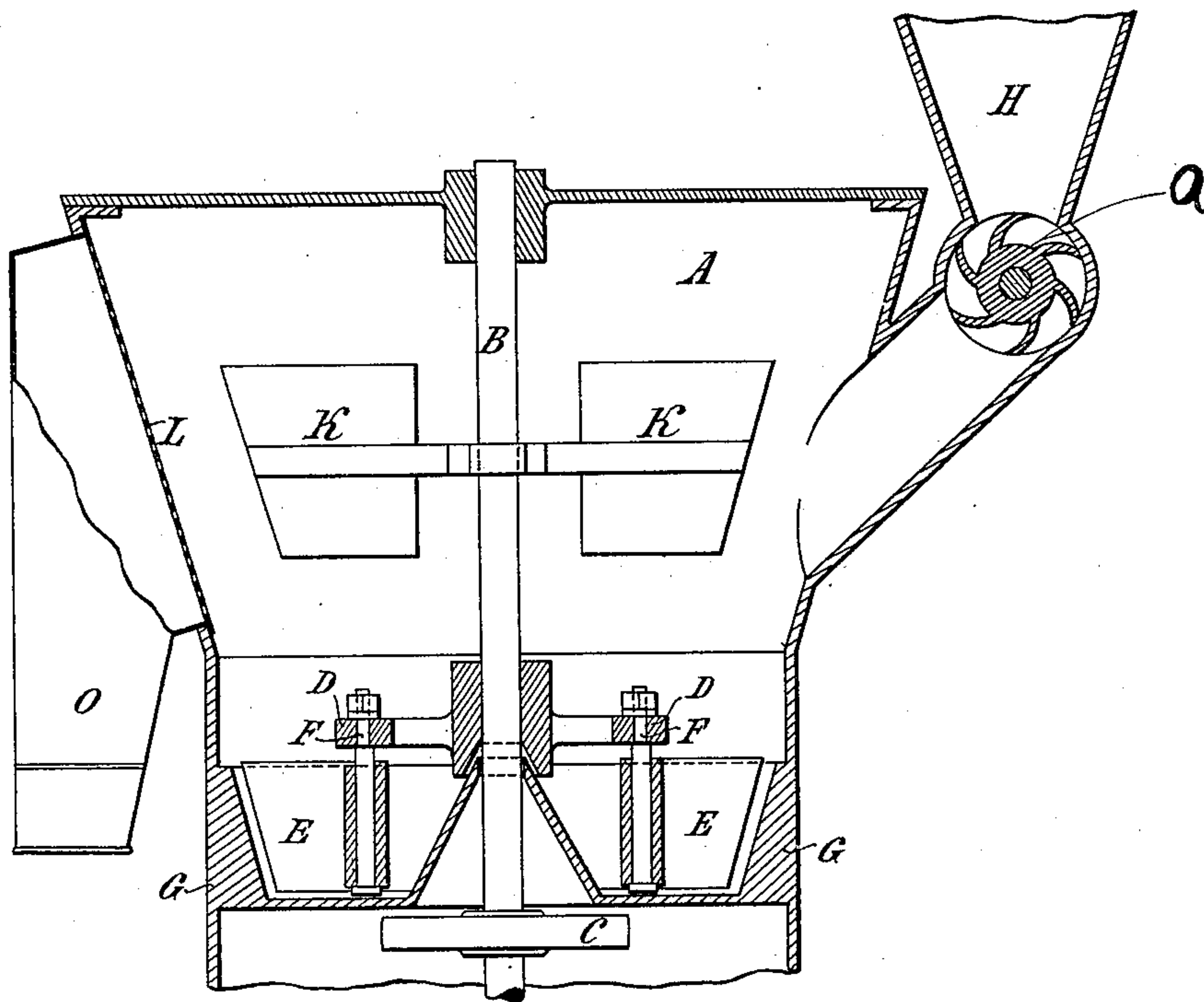
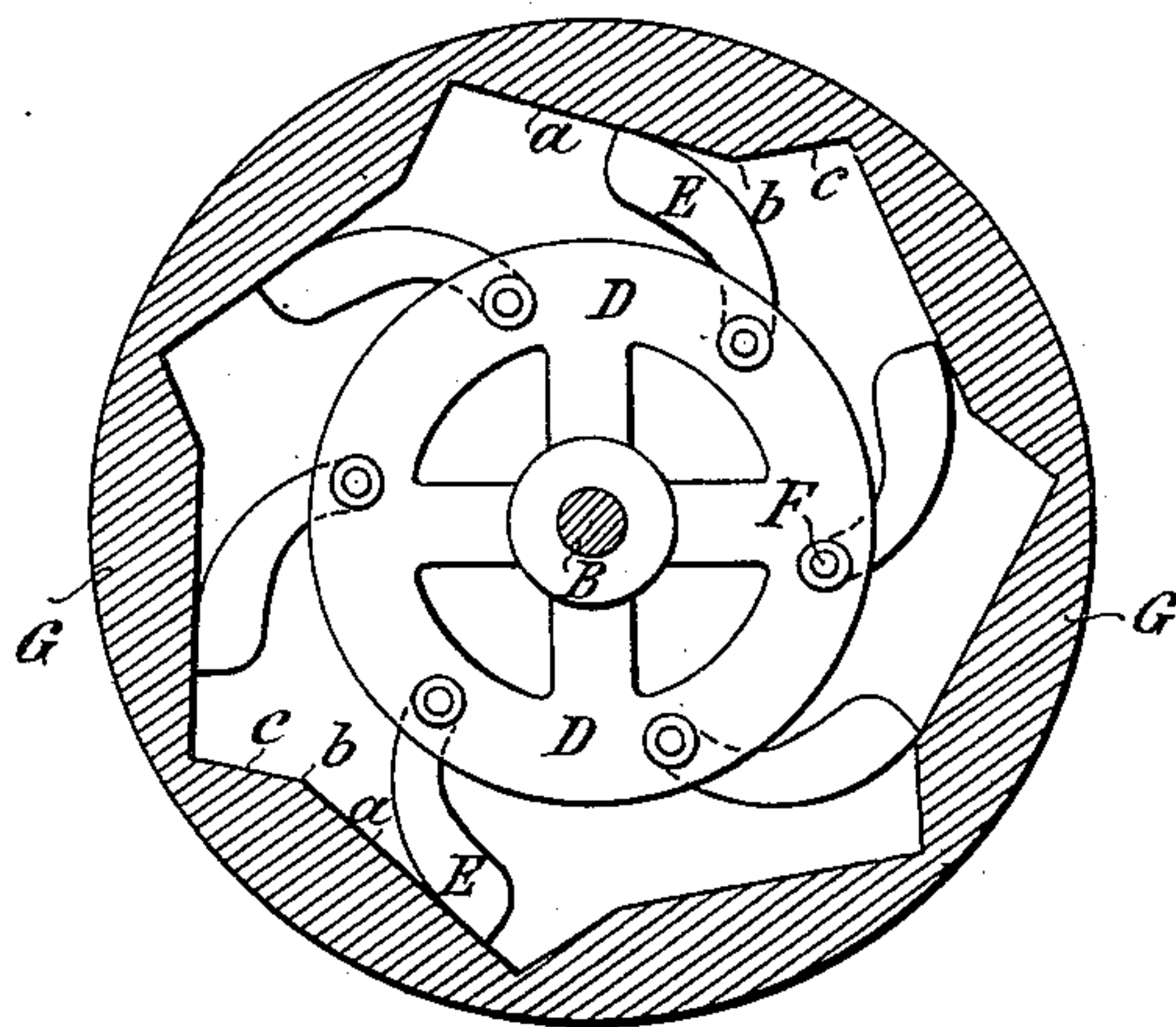


Fig. 2.



WITNESSES.

*Julius E. Eitz;*  
*John L. Latta*

INVENTOR:

*J. Pöttgens.*

BY

*Munn & Co.*  
ATTORNEYS

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Fig. 3.

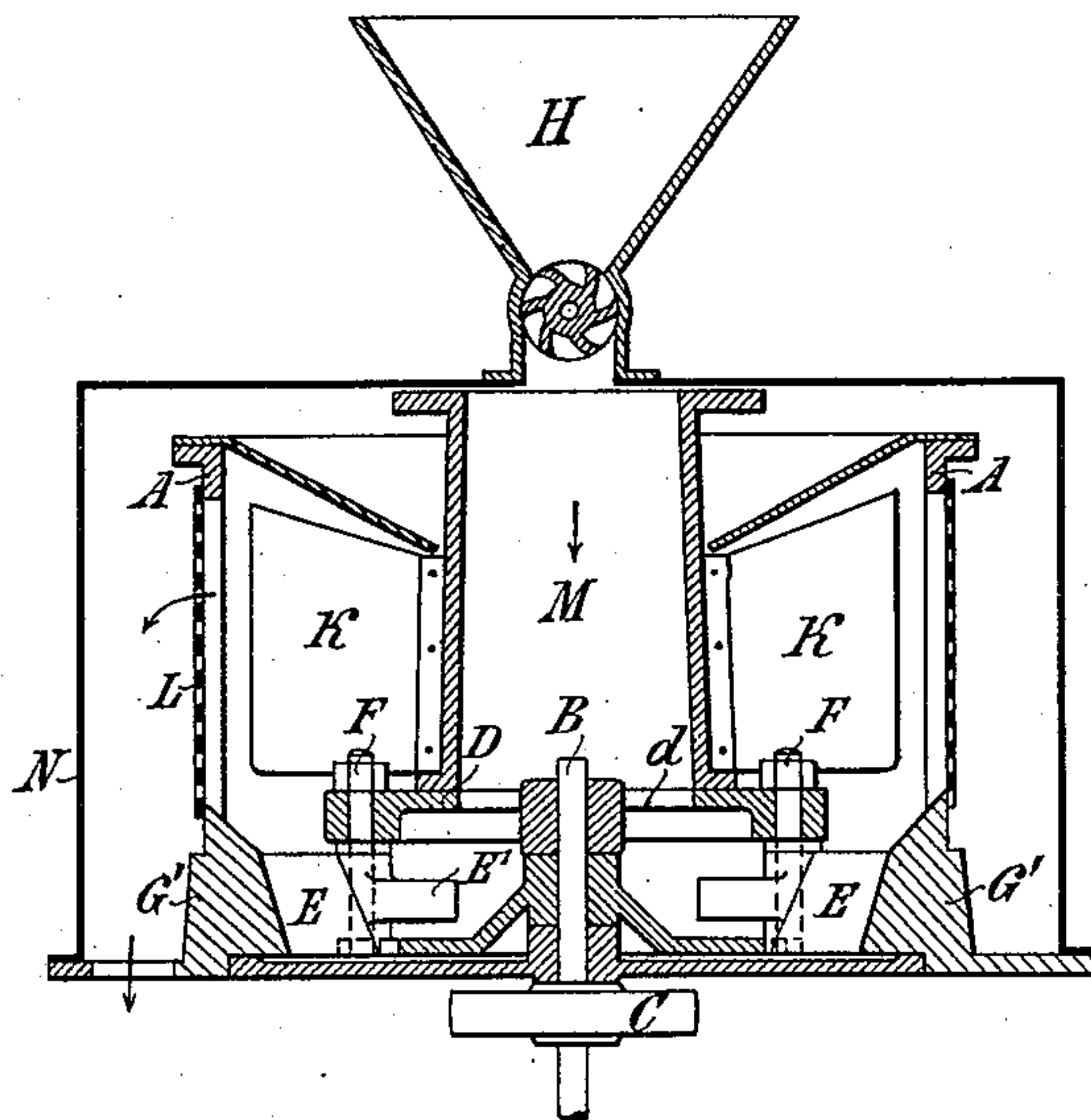
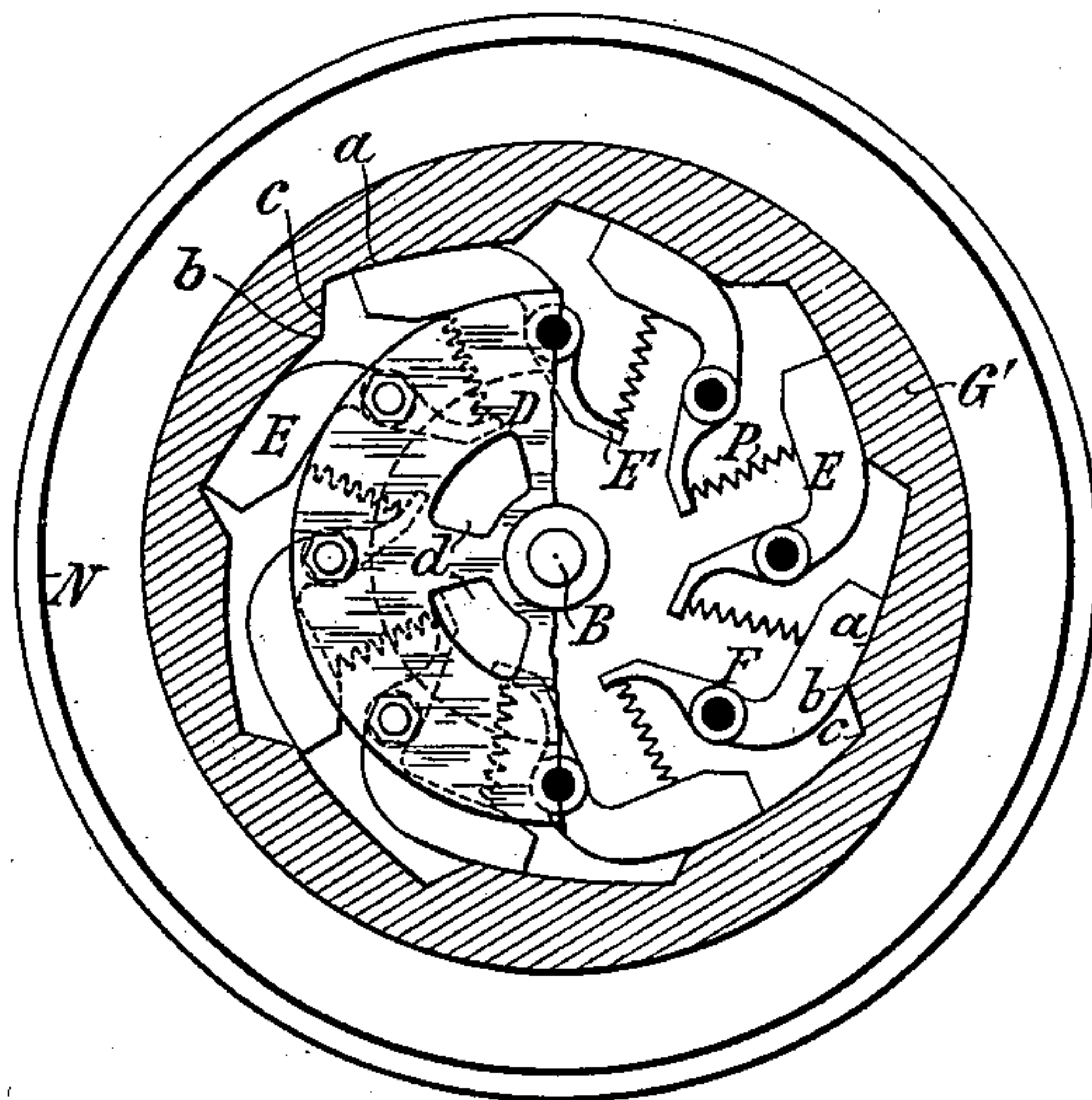


Fig. 4.



WITNESSES.

*Julius Pötgens*  
*John Lottka*

INVENTOR;

*J. Pötgens*

BY

*Murray*

ATTORNEYS



# UNITED STATES PATENT OFFICE.

JOHANN PÖTTGENS, OF BERLIN, GERMANY, ASSIGNOR TO EDUARD DALCHOW, OF SAME PLACE.

## GRINDING AND PULVERIZING MACHINE.

SPECIFICATION forming part of Letters Patent No. 611,867, dated October 4, 1898.

Application filed August 5, 1897. Serial No. 647,270. (No model.)

*To all whom it may concern:*

Be it known that I, JOHANN PÖTTGENS, a subject of the German Emperor, and a resident of Berlin, Germany, have invented a new and useful Improvement in Grinding and Pulverizing Machines, of which the following is a full, clear, and exact description.

This invention relates to a machine for grinding and pulverizing a great variety of substances, such as corn, minerals, coal, pigments, and the like.

The machine is characterized in the first place by the novel shape of the inner wall of the stationary "drum" or chamber inclosing the grinding or pulverizing mechanism, while a further novel feature of the invention consists in the arrangement of a series of grinders or beaters adapted to act by centrifugal force upon (or in conjunction with) the non-circular inner surface of the said drum or chamber in such a manner that the substance is divided or disintegrated alternately by attrition and pounding. In addition to this the said beaters may, in the manner hereinafter to be described, operate under the action or control of springs designated to fulfil the double object of increasing the effect of the beaters and as far as possible preventing the recoil of the same.

The invention will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a vertical section of a machine constructed in accordance with this invention. Fig. 2 is a cross-section, taken in a horizontal plane, through the grinding-chamber G. Fig. 3 is a vertical section illustrating another arrangement of the machine; and Fig. 4 is a horizontal section of the grinding-surface G', Fig. 3, (the equivalent of the chamber G of the first-mentioned arrangement,) showing the disposition of the springs controlling the beaters.

In the construction represented in Figs. 1 and 2 a disk D is mounted upon the shaft B within the casing A, and is provided with any suitable number of grinders or beaters E, which are pivoted to the disk D, as shown. This disk or beater-carrier D may receive rotary motion from any available source of

power through the medium of a driving-pulley C. The interior surface or wall G, forming a die, against or in conjunction with which the beaters E are adapted to work, is not circular, but consists of a series of inclines, as indicated in Fig. 2, the said beaters being caused to come into frictional contact with such surfaces by centrifugal force. As the beaters sweep past the slightly-inclined surface *a* they act upon the corn or other substance to be ground by both grinding and disintegration, and as soon as they reach the corners or edges *b* they slide along the more abruptly-inclined faces *c*, and on passing these deliver a powerful blow upon the intervening corn or the like, thereby pounding the same.

The feeding contrivance to be employed should preferably be a hopper, such as H.

The object of the wings or vanes K, which are held to rotate with the shaft B, is to throw up the substance when sufficiently divided and to eject it from the casing through the screen L. Should any part of the substance, although as finely divided as it is required to be, nevertheless fail to pass through the meshes of the sheet or sieve L, such substance will redescend into contact with the set of beaters. The operation of beating up and raising the ground or pulverized substance may be assisted by the shape of the grinding-surface G, which is not cylindrical, but is that of an upwardly-flaring hollow cone, as illustrated in Fig. 1, whereby the substance, impelled by centrifugal force, naturally acquires an upward tendency.

The machine herein described may be modified in various ways. Thus the vanes K may, if desired, be dispensed with or replaced by other arrangements for carrying off or discharging the corn or other substance when sufficiently ground. The feeding appliances also may be other than those shown. If desirable, more than one set of beaters may be used, in which case the several sets may be either combined into one set acting simultaneously or arranged to operate in succession—say in tiers located one above the other with or without the interposition of vanes, employed for exhausting or ventilating purposes. If preferred, the wall of the grinding-



chamber may be cylindrical—that is to say, upright and parallel, instead of tapering—the common feature in all cases being the provision of the beaters E, and also the peculiar  
 5 configuration of the grinding-surface G, as illustrated in Fig. 2, by the coöperation of which the requisite compound rubbing and pounding effect is secured.

In the construction shown in Figs. 3 and 4  
 10 the substance to be ground is supplied through the hopper H, the rotary distributor Q, and the feeding-channel M, secured axially upon the disk D. From this channel the substance falls through apertures *d* toward  
 15 the pulverizing mechanism arranged below the disk D. The vanes K, together with the disk D and the feeding-channel M, rotate in unison. The substance when sufficiently ground is beaten up by the vanes K and  
 20 passes through the screen L into the outer chamber, inclosed by the casing N, whence the said substance escapes through the opening at the bottom. (See the arrow in Fig. 3.) In this form of the machine, Figs. 3 and 4,  
 25 the beaters E are constructed with extensions E'. These beaters thus form double-armed levers, and they are so arranged behind each other that the extension E' of each beater faces the part E of the next beater, while the  
 30 spring P forces apart the adjacent parts E E'. By this arrangement each spring acts upon two adjacent beaters simultaneously, so that the pressure of the springs is taken advantage of in two directions. The said springs  
 35 thus not only increase the effect of the centrifugal force, but at the same time prevent the beaters from rebounding from the walls of the grinding-chamber. Buffers of any suit-

able construction may be substituted for the said springs P. 40

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

1. The combination of the rotatable beater-carrier, the beaters pivoted thereto to swing  
 45 outward by centrifugal force, the stationary die surrounding the beater-carrier and provided with a continuous inner surface having at regular intervals all along its periphery portions of alternately greater and smaller in-  
 50 clination, said surface being engaged by the beaters continuously, and means for feeding the material axially into the space between the beaters and the die.

2. The combination of the stationary  
 55 stepped surrounding wall, the rotary beater-carrier, the beaters pivoted to the carrier and adapted to be thrown against said wall by centrifugal force, said beaters being provided with extensions at their pivot ends, and  
 60 springs interposed between each beater and the extension of the adjacent beater, substantially as described.

3. The combination of the stationary  
 65 stepped surrounding wall, the rotary beater-carrier, the beaters pivoted to the carrier and adapted to be thrown against said wall by centrifugal force, and springs interposed between the adjacent beaters and engaging  
 70 them on opposite sides of their pivots so as to press each beater outwardly, substantially as described.

JOHANN PÖTTGENS.

Witnesses:

OTTO RIESCHEL,  
 FRITZ V. KELLER.