

(No Model.)

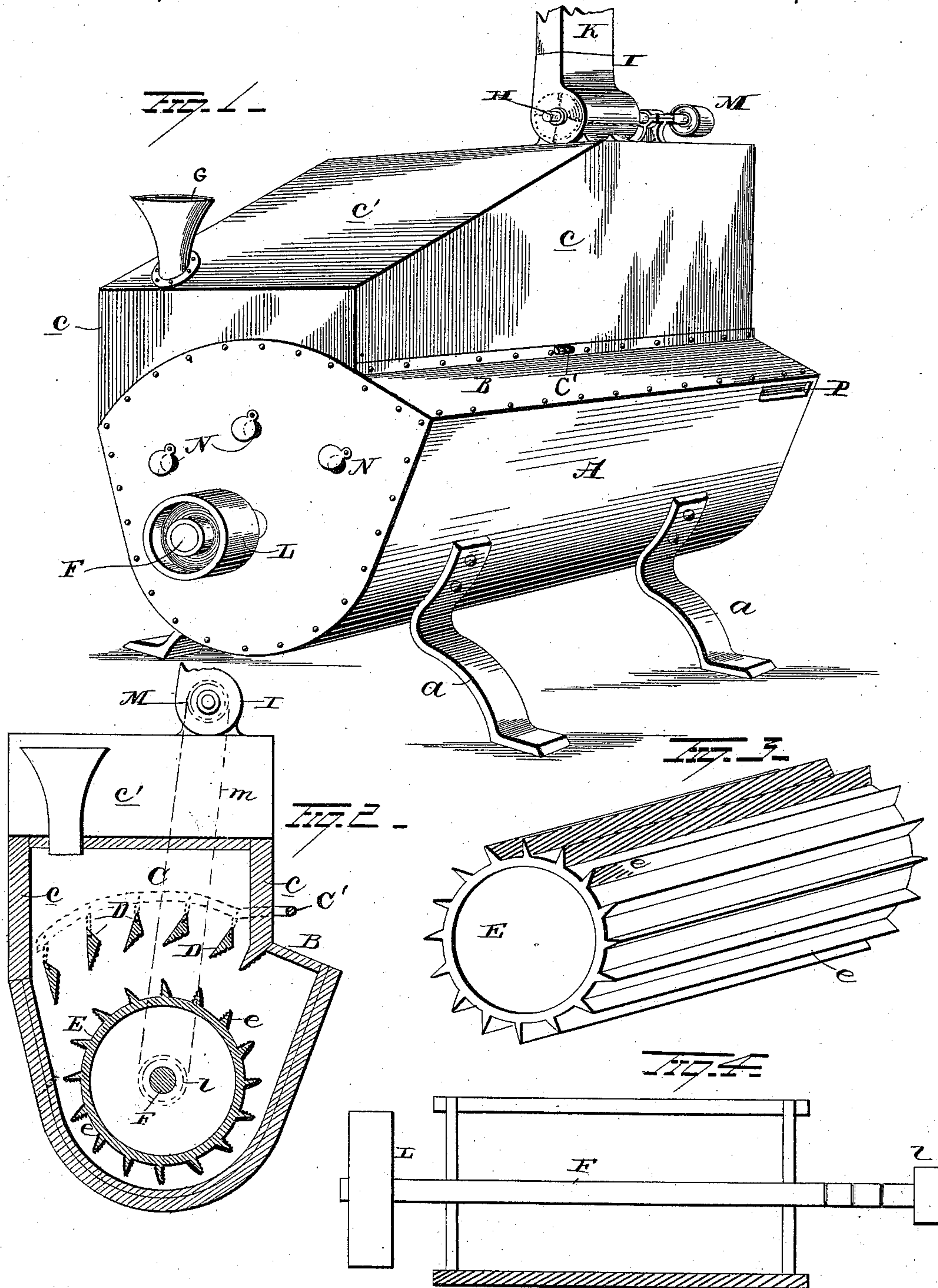
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J. J. FAULKNER.

FLOUR MILL.

No. 385,175.

Patented June 26, 1888.



WITNESSES.

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(No Model.)

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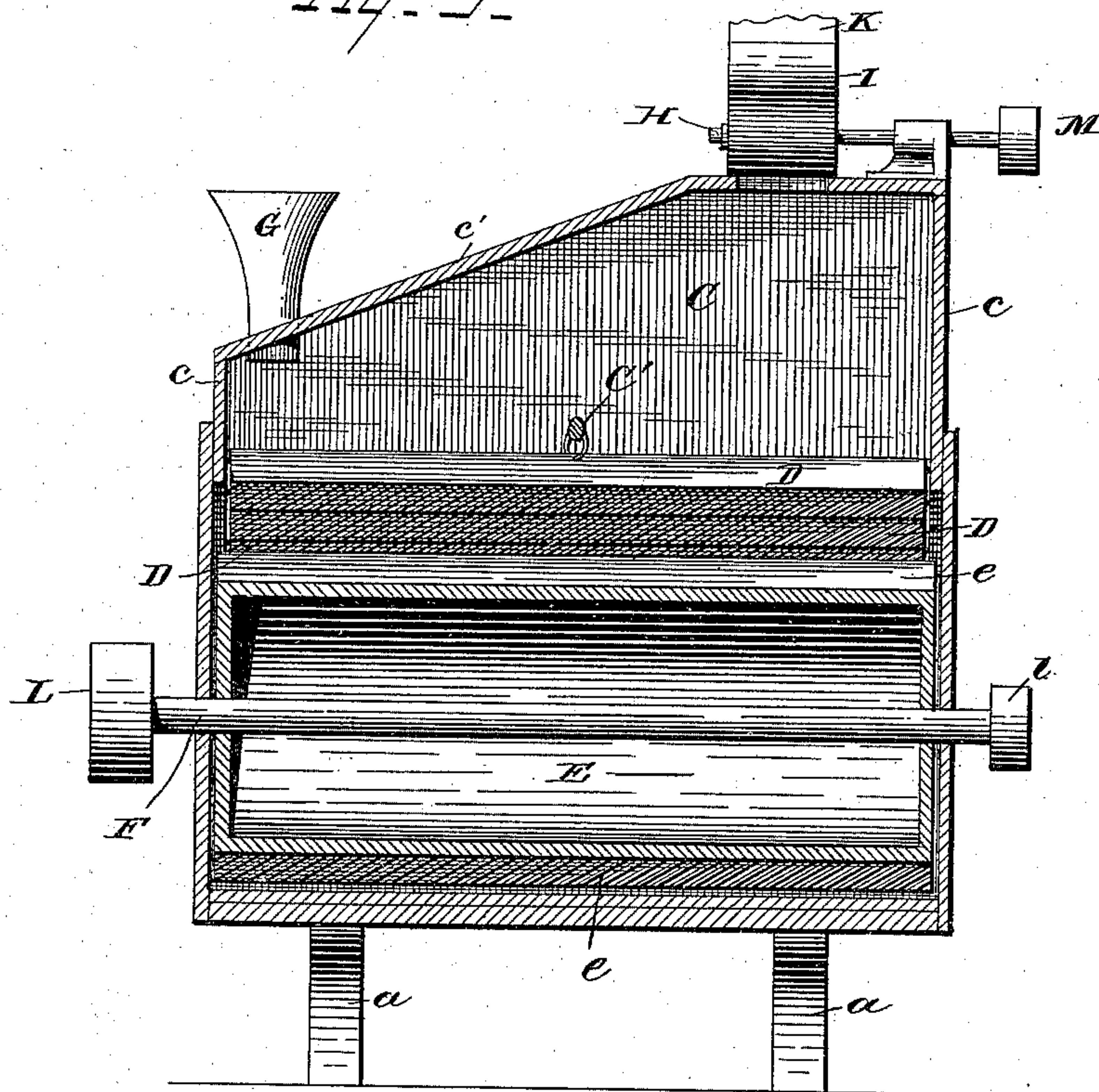
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Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES JONES FAULKNER, OF JACKSON, MICHIGAN.

FLOUR-MILL.

SPECIFICATION forming part of Letters Patent No. 385,175, dated June 26, 1888.

Application filed August 17, 1886. Serial No. 211,123. (No model.)

To all whom it may concern:

Be it known that I, JAMES JONES FAULKNER, of Jackson, in the county of Jackson and State of Michigan, have invented certain new and useful Improvements in Flour-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.

My invention relates to an improvement in pulverizing-mills, and more particularly to that class of mills in which a rotary beater is employed to pulverize the grain by striking it and throwing it into contact with an opposing surface.

The object is to provide a simple and inexpensive mill in which the grain or other material may be reduced to any degree of fineness desired, and the degree of fineness regulated by an air inlet and exhaust.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view of the mill in perspective. Fig. 2 is a vertical cross-section, and Fig. 3 is a detached view, of the rotary beater. Fig. 4 represents a modified form of beater, and Fig. 5 is a longitudinal vertical central section.

A casing, A, of any suitable length, is supported upon legs *a*, or upon any convenient support. The bottom of the casing A is rounded, as shown, and its sides gradually diverge as they extend upwardly. At a point at such a distance from the curved bottom of the casing as may be found practicable the casing is narrowed by a plate, B, set at right angles, or nearly so, to the side. The width of the plate B, which may be conveniently termed the "impact-plate," may be greater or less, as found expedient. The surface of the plate may be either smooth or corrugated.

From the upper edge of one of the sides of the casing A and from the inner edge of the impact-plate B extend the sides *c* of the air-exhaust chamber C, the top *c'* of which is preferably set obliquely, as shown, thereby gradually increasing the size of the chamber from the end where the grain is fed toward the end where the flour is removed. In a plane between the planes of the beater and grain-feed,

and to one side of the impact-plate, are located the movable grate-bars D, which latter form the bottom of the chamber C and present more or less abrupt surfaces, against which the grain is forced at a greater or less angle, according to their slant, thus pulverizing the grain accordingly. The grate-bars D are preferably of triangular form, and are capable of being adjusted so as to present a more or less abrupt surface to the rapidly-moving grain, as will hereinafter appear. The surfaces of the grate-bars are also preferably corrugated or roughened.

Within the casing A is journaled a rotary beater, E. The form of beater shown in connection with the casing, Fig. 2, is a hollow cylinder or drum either secured on a central shaft, F, or provided with trunnions. It is provided at the surface with a series of wings or beaters, *e*, which preferably have abrupt front faces corrugated or roughened, as shown. The number of wings or beaters *e* will naturally depend upon the size of the cylinder E and the rapidity with which it revolves. The cylinder is so located within the casing that the edges of the wings *e* travel near the rounded bottom of the casing, while the flaring sides, impact-plate, and arched series of grate-bars are farther removed from it.

At the end of the casing A over which the more contracted end of the exhaust-chamber is located is the grain-feed G, preferably a funnel-shaped hopper adapted to conduct the grain through the grate-bars on the side of the casing opposite the impact-plate and in front of the wings on the cylinder.

On top and at the opposite end of the exhaust-chamber is located the exhaust-fan H, suitably housed in a casing, I, which opens into the exhaust-chamber C. A flour-conducting pipe, K, leads from the casing I to the flour-receptacle. (Not shown.) The shaft F or trunnions, as the case may be, extend through the said ends of the casing, and are provided at one end with a band-pulley, L, through which power is transmitted from an engine or other source to the rotary beater, and at the opposite end with a pulley, *l*, which, through a band, *m*, is adapted to communicate motion to the fan-driving pulley M; or the pulley L might be located on the same projecting end of the shaft with the pulley *l*.

The beater E is intended to be revolved at a very high rate of speed, and the grain, drawn in or falling between the beaters, is struck and cracked thereby, and, being carried around 5 by the wings, is hurled with great velocity against the impact-plate B and partially or completely pulverized thereby. The partially-pulverized grain and flour fall from the plate B, to be again struck by the beaters and hurled 10 against the faces of the adjustable grate-bars D. In the meantime there is a constant draft of air through the exhaust chamber C and out through the flour-conducting pipe K, caused by the fan H. The force of the draft is regulated by 15 means of one or more valves or dampers, N, located in the front end of the casing, and is kept sufficiently strong to carry the flour, when reduced to the required degree of fineness, out of the exhaust-chamber and through the pipe K to 20 the flour-receptacle. The force of the draft is, however, not allowed to be strong enough to carry the partially-reduced grain out with the flour, and such partially-reduced grain therefore falls back from the grate-bars and is fur- 25 ther pulverized.

A convenient means for adjusting the grate-bars would be to provide set-screws extending through the ends of the casing and impinging against their ends, or they might be connected 30 and caused to move simultaneously by means of the operating-rod C', which latter extends through the casing. Their positions relatively to the flying grain and flour would naturally determine the rate of feed from the interior of 35 the casing into the exhaust-chamber C, and this adjustment, taken in connection with the regulation of the force of the draft, admits of grading the fineness of the flour to the nicest degree.

40 The modified form of beater represented in Fig. 4 consists, essentially, of a series of metallic wings—two or more—firmly secured to a central shaft by radial arms. By the employment of such modified form of beater I am 45 enabled to effect a discharge of the finely-pulverized material through an opening, P, at the opposite end of the casing from the feed, and am able to dispense with the air-exhaust. The air-inlet in this instance should be near the 50 shaft at the end opposite from the discharge, and be admitted in a lesser or greater quan-

tity to regulate the discharge, as may be required.

It is evident that many slight changes might be resorted to in the form and arrangement of 55 the several parts described without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the construction herein set forth; but,

Having fully described my invention, what I 60 claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a casing having a grain-feed and a rotary beater located within the casing, of a series of adjustable grate-bars 65 located in a plane between the planes of the beater and grain-feed, substantially as set forth.

2. The combination, with a casing and an exhaust-chamber in open communication there- 70 with, of a rotary beater located within the casing below the exhaust-chamber, a series of adjustable grate-bars arranged in arched form above the beater, and a flour-conducting pipe connected with the exhaust-chamber, substan- 75 tially as set forth.

3. The combination, with a tapered exhaust-chamber, a beater-casing, and a set of adjust- 80 able grate-bars separating said chamber and casing, of a grain-feed at small end of the exhaust-chamber and an exhaust-fan at the large end of said exhaust-chamber, substantially as set forth.

4. The combination, with a flaring casing and the winged beater journaled therein, of the ex- 85 haust-chamber located above the beater, the exhaust-fan in open communication with the exhaust-chamber, and the valves or dampers in the end of the casing for regulating the force of the draft, substantially as set forth.

5. In a pulverizing-mill, the combination, 90 with one or more revolving beaters provided with corrugated or roughened surfaces, of an impact-plate and grate-bars located above the beaters and having corrugated or checked surfaces, substantially as set forth. 95

In testimony whereof I have signed this specification in the presence of two subscrib- ing witnesses.

JAMES JONES FAULKNER.

Witnesses:

ELI A. CLEMENT,
GEORGE POWELL.