

No. 744,452.

PATENTED NOV. 17, 1903.

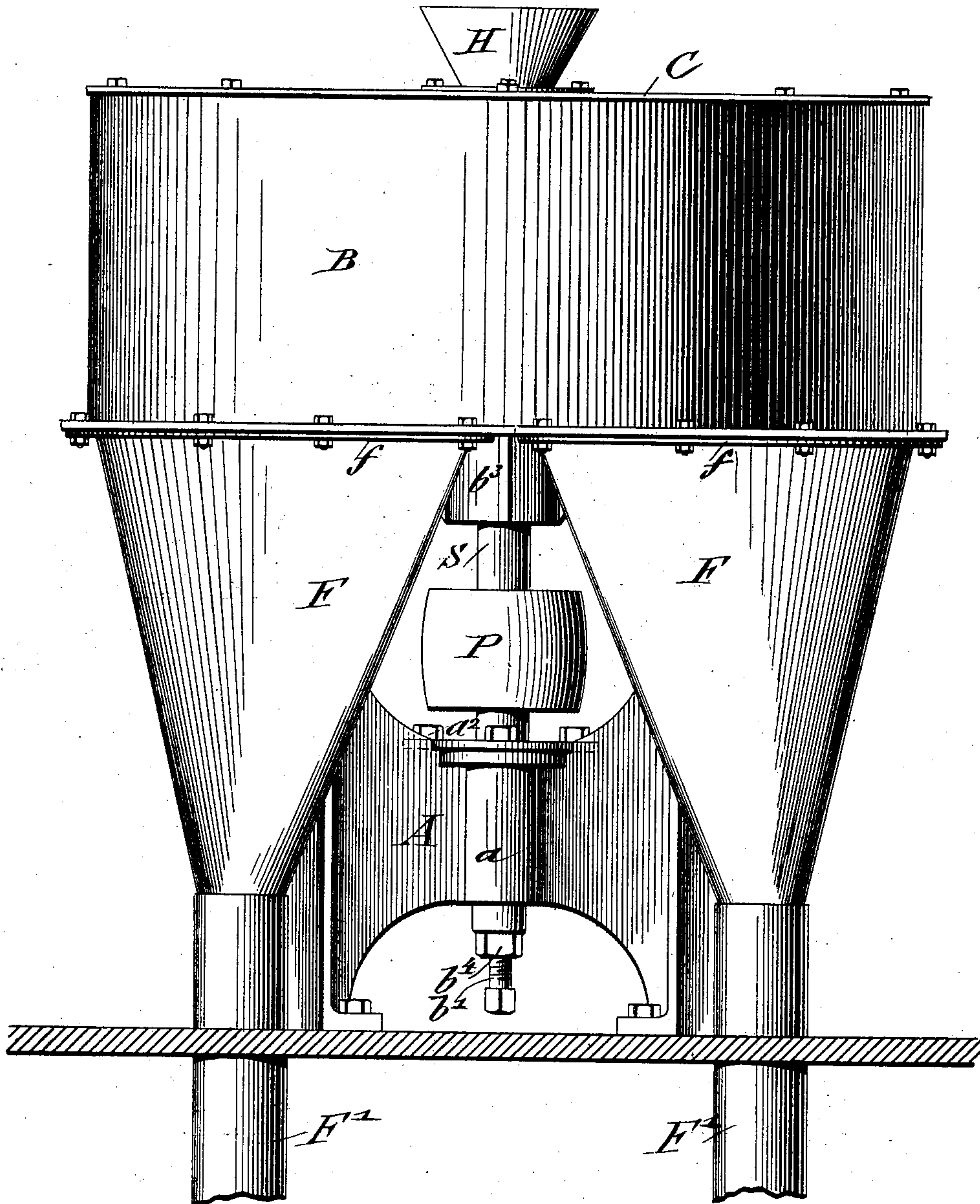
M. F. ABBÉ.
GRINDING MILL.

APPLICATION FILED AUG. 22, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig:1.



Witnesses
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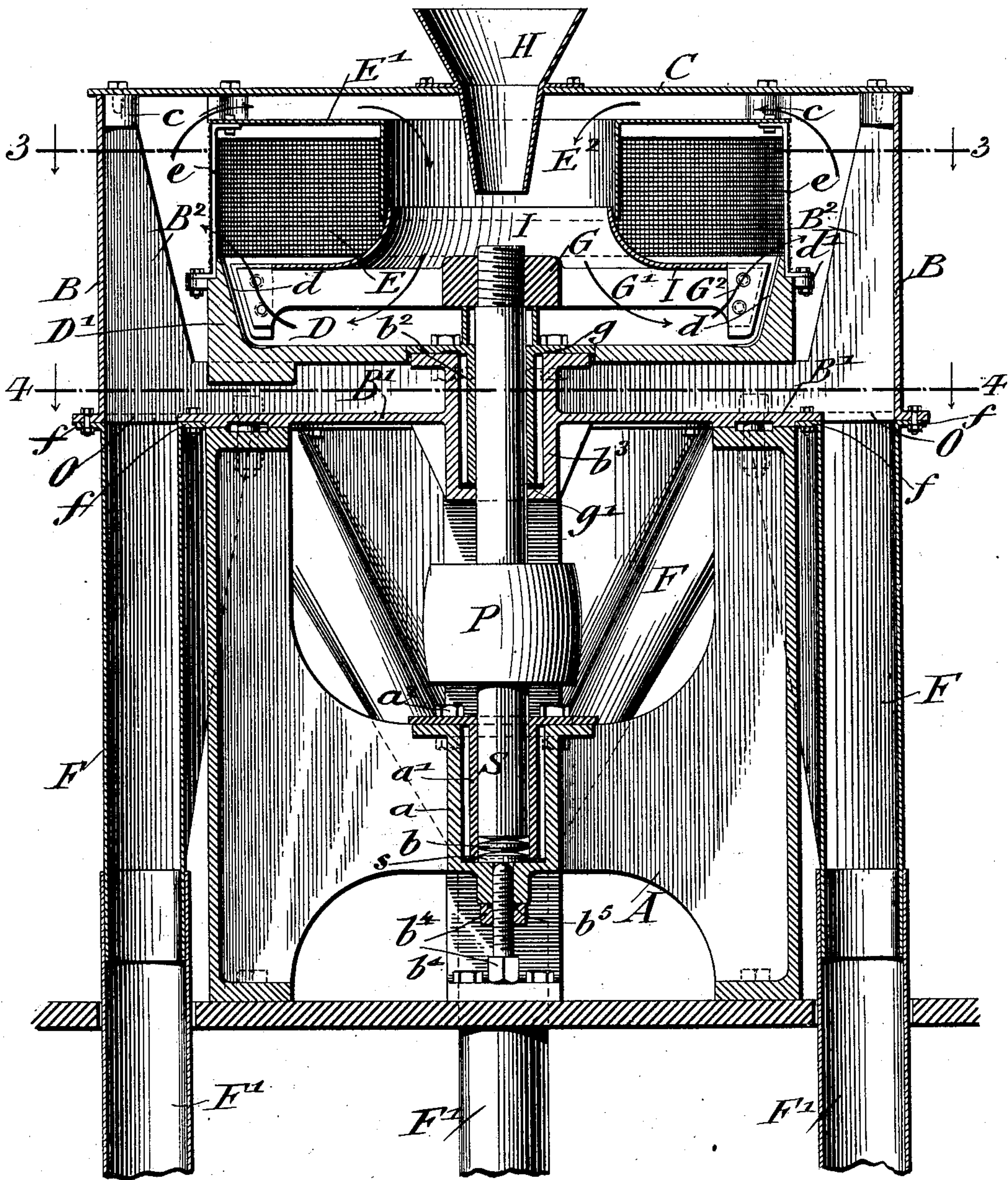
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APPLICATION FILED AUG. 22, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

Fig. 2.



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APPLICATION FILED AUG. 22, 1902.

NO MODEL.

3 SHEETS—SHEET 3.

Fig. 3.

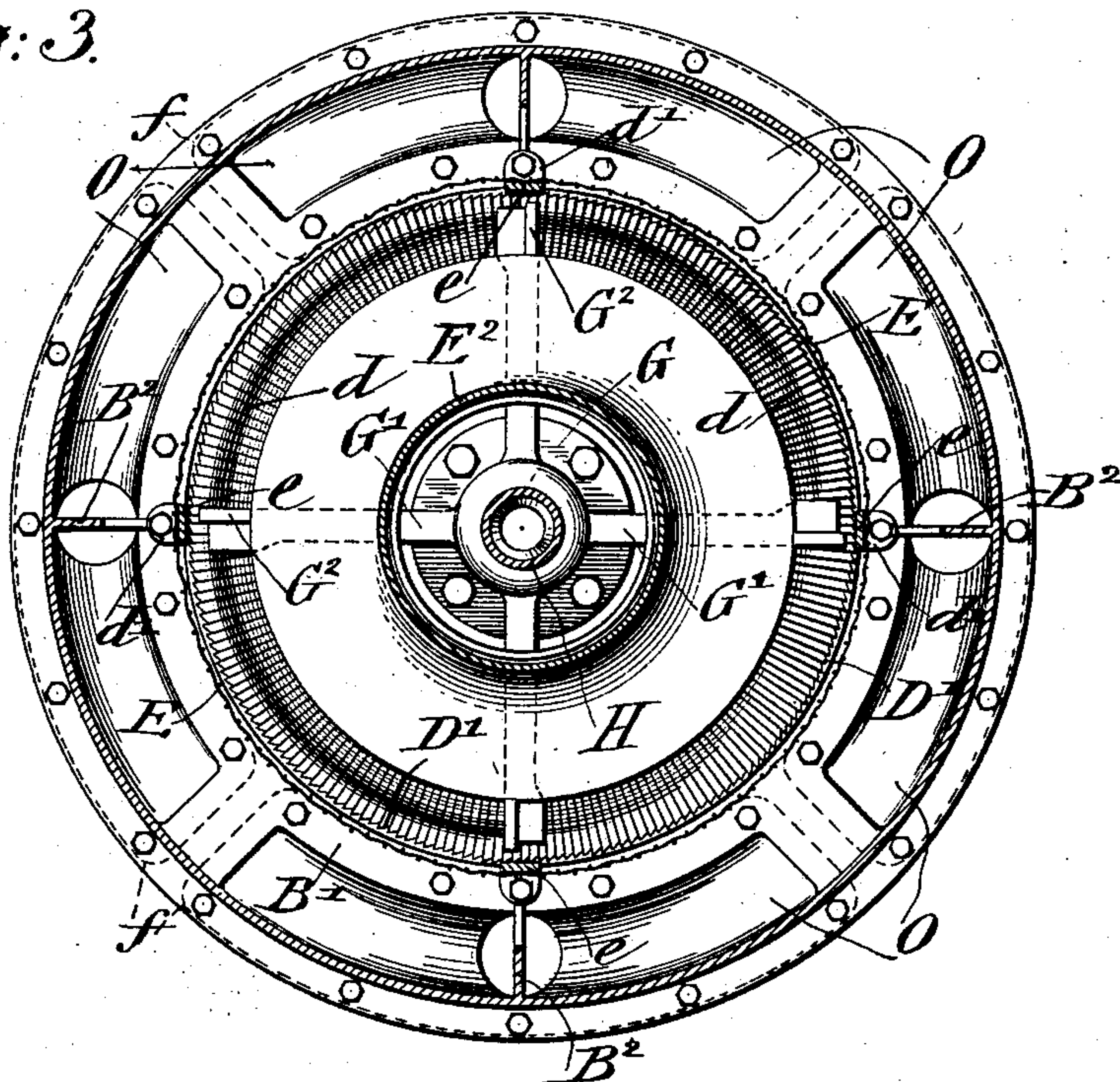
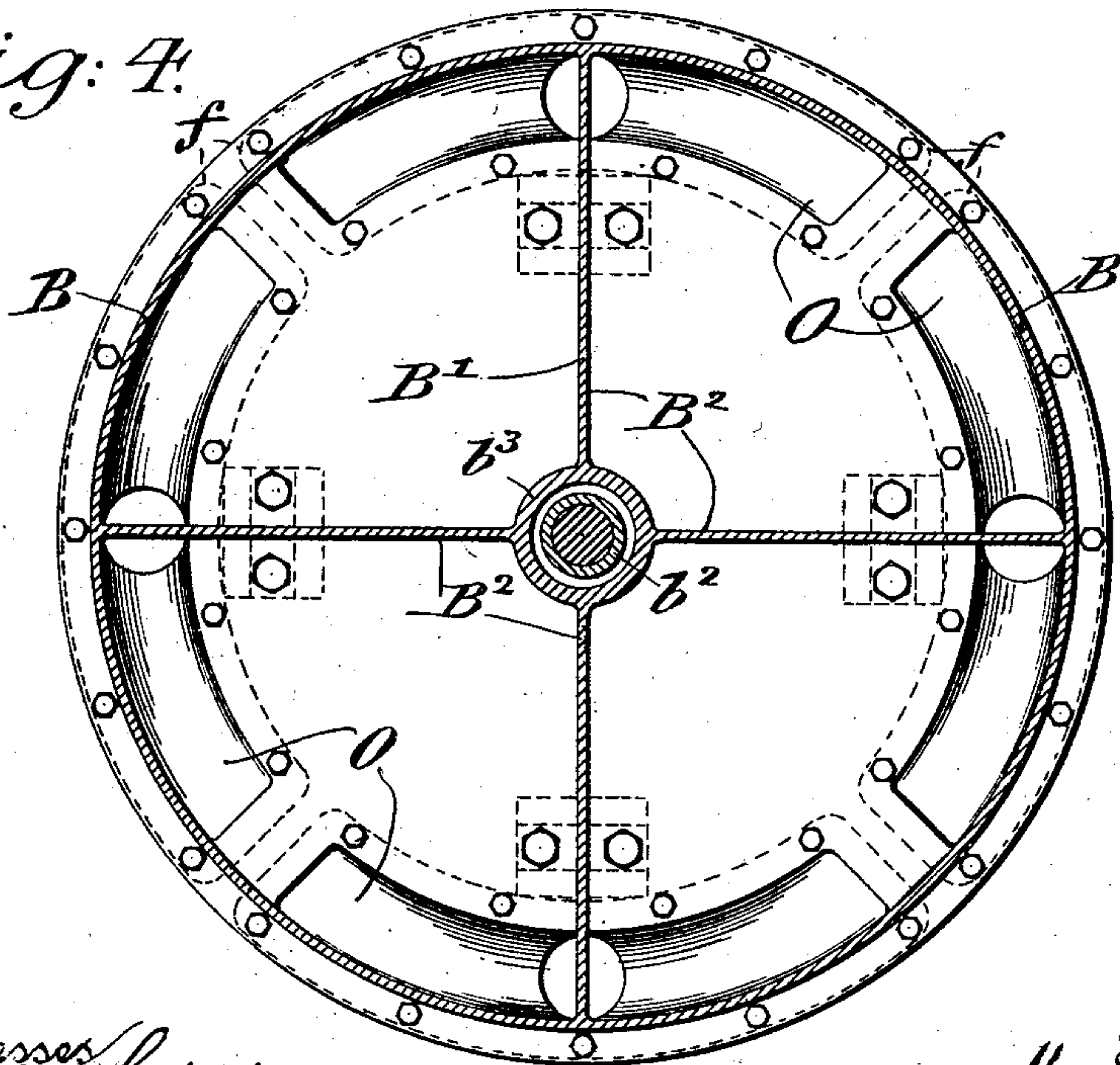


Fig. 4.



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UNITED STATES PATENT OFFICE.

MAX F. ABBÉ, OF NEW YORK, N. Y.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 744,452, dated November 17, 1903.

Application filed August 22, 1902. Serial No. 120,638. (No model.)

To all whom it may concern:

Be it known that I, MAX F. ABBÉ, a citizen of the United States, residing in New York, borough of Manhattan, and State of New York, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification.

This invention relates to certain improvements in grinding-mills, and more especially to improvements in grinding-mills of that class in which a stationary grinding-ring is used in connection with rotary beaters and a screen through which the ground material is conducted off; and the invention consists of a grinding-mill which comprises an exterior casing provided with radial ribs, a pedestal for supporting said casing, a grinding-ring supported on the radial ribs of the casing, a rotary shaft supported in neck and step bearings of the casing and pedestal, respectively, rotary beaters supported on the extremities of radial arms supported on said shaft, a cylindrical screen above the grinding-ring, a cover for said screen having a cylindrical portion at its center extending in downward direction, an annular cover above the radial arms of the beaters having an upwardly-extending portion projecting into the downwardly-extending portion of said screen-cover, a central feed-hopper, and a cover for the exterior casing above the cover of the screen.

The invention consists, further, of a stationary grinding-ring, rotary beaters in connection with said grinding-ring, an annular cover, a cylindrical screen above the grinding-ring, a cover for the same having an interior cylindrical portion surrounding a portion of the annular cover, an exterior casing, a closed cover for said casing at some distance from the cover of the screen, so that an interior circulation of air can be established through the screen, the space between the interior and exterior covers, and through the opening of annular cover to the grinding-ring, and downwardly-extending segmental discharge-funnels circumferentially arranged at the lower portion of said exterior casing; and the invention consists, lastly, of certain details of construction which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation of my improved grinding-mill. Fig. 2 is a vertical central section of the same; and Figs. 3 and 4 are horizontal sections, respectively, on lines 3-3 and 4-4, Fig. 2.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the pedestal of my improved grinding-mill, which is formed with four standards radially arranged around a central portion, said standards being firmly secured to the floor. The central portion is provided with a vertical socket *a*, in which is arranged a flanged sleeve *a'* and secured therein by means of bolts *a''*, passing through the flange. The socket and sleeve form a step-bearing for the shaft S, as will be explained hereinafter. To the upper ends of the standards of the pedestal is bolted a cylindrical casing B, that is provided with the horizontal bottom B', formed integral therewith and strengthened by the radial ribs B². The bottom B' is provided with a cylindrical sleeve b², arranged in the socket b³ vertically above the socket *a* of the pedestal and forming a neck-bearing for the shaft S. This neck-bearing is formed, like the step-bearing of a cylindrical sleeve, with a circumferential flange at its upper end, which flange is bolted to the bottom of the casing B and closed at the upper and lower ends by elastic gaskets *g g'* to keep the bearings free from dust and ground material, as shown clearly in Fig. 2. The casing B is provided with a cover C, which is bolted to interior lugs *c* of the casing and which supports at its center a hopper H, through which the material to be ground is fed to the grinding-ring. Between the ribs B² of the casing are arranged segmental openings O, near the circumference of the casing, from which extend in downward direction segmental funnels F, which are provided with flanges *f* at their upper ends for being bolted to the casing and which are connected at their lower ends with pipes F', that discharge the ground material to suitable compartments below the floor.

On the inner portions of the ribs B² of the casing B is supported a circular grinding-plate D. This plate is provided with an annular flange D', having a frusto-conical inner

surface that is furrowed to form the grinding portion d . At suitable points of its circumference the flange D' is provided with lugs d' , to which the upright supporting-
 5 straps e for the cylindrical screen E are attached. These straps bend outwardly at their lower ends and inwardly at their upper ends, so as to support the cover E' of the screen, said cover being provided with a
 10 downwardly-extending cylinder E^2 , that is concentric with the screen. To the shaft S is attached, above the neck-bearing, the hub G of the beater-frame, which is formed of four arms G' , provided at their outer ends
 15 with steel beaters G^2 , attached by countersunk bolts to the arms flush with the face of the same, as shown in Figs. 2 and 3. On the beater-arms G' is supported an annular cover I , formed with an upwardly-bent contracted
 20 portion, which extends somewhat above the lower edge of the interior cylinder E^2 of the screen-cover E' . This cover I serves for the purpose of permitting a free circulation of air in the direction of the arrows through the
 25 interior cylinder E^2 and the cover I to the grinding-ring D and in upward direction through the screen and the space between the cover C of the exterior casing and the cover E' of the screen, so that the current of
 30 air produced by the rotating beater-arms circulates continuously in the same course without resorting to the outside atmosphere for relieving the pressure at the grinding-surface. The quick rotation of the beater-arms
 35 produces an effective action near the central portion of the grinding-plate and keeps thereby the air in motion, so as to produce the cooling of the grinding-surfaces and prevent any injurious pressure of the air on the operating
 40 parts. The face of the beaters is flush with the ends of the beater-arms, so as to produce the free outward sliding and forcing of the material by centrifugal force toward the grinding-ring. This is an important fea-
 45 ture, as there is no impediment to the flow of material in outward direction, so that it can be acted on effectively by the grinding-ring and the beaters, which project outwardly and downwardly from the ends of the beater-
 50 arms, as shown clearly in Fig. 2.

The step-bearing for the driving-shaft S is formed of a disk-shaped fiber plate b with convex sides, having a steel disk s below the same, with a convex side adjacent to the fiber
 55 disk. A tightening-gasket is interposed between the socket a and the bearing of the interior sleeve a' of the step-bearing. A screw b' is arranged below the lower steel disk, said screw being provided with a jam-nut b^4 and
 60 lamp-wick gasket b^5 and serving for adjusting the step-bearing, and thereby by the position of the shaft the position of the beaters, so as to provide for the wear of the same. This screw also regulates the distance be-
 65 tween the beaters and the grinding-ring, and it has the advantage that convenient access is given to the same, as the attendant can

get directly to the space formed between the discharge-funnels and the two adjacent stand-
 ards, as shown in Fig. 1. The adjustment
 70 of the set-screw can therefore be accomplished at any time without removing any parts of the mill. The journals of the shaft at their neck and step bearings are lubricated by any
 75 suitable lubricating devices connected with the same. Power is imparted to the shaft by means of a pulley P , which is keyed to the shaft between the neck and step bearings, said pulley receiving power by a motion-
 80 transmitting belt from a suitable driving-shaft.

The grinding-ring D , screen E , and the top plate E' form one connected mechanism, which can be taken out from the mill com-
 85 plete by first taking off the top plate C of the exterior casing B and the beater-arms, with the annular cover supported thereon. The entire driving mechanism is thereby not in-
 90 terrupted, so that repairs can be made to these parts without interfering with the driving mechanism.

My improved grinding-mill has the following advantages: First, the casing is support-
 ed at a suitable height, so that the discharge
 95 funnels or spouts are above the floor, so that the ground material can be discharged independently into receiving-chambers directly; second, all the journals of the bearings of the
 100 driving-shaft are below the working or grinding parts of the mill, so that it is impossible for any oil to get into the material being ground; third, the grinding-ring, screen,
 105 beater-arms, and annular cover can be removed independently without interfering with the driving mechanism that is arranged below the same; fourth, by the arrangement
 110 of the annular cover on the beater-arms and its relative position to the grinding-ring and screen-cover an effective circulation of air is kept up continuously without any air-inlet; fifth, the exterior casing, discharge-funnels,
 115 air-space in the same, and the grinding parts can all be removed independently of the driving mechanism, so that a very compact grinding-mill is obtained in which all the parts are uniformly balanced and conveniently ar-
 120 ranged.

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

1. In a grinding-mill, the combination, with
 a stationary grinding-plate having a circum-
 125 ferential grinding-ring, of a cylindrical screen supported on the circumference of said grinding-ring, a cover for the screen provided with a downwardly-extending interior cylindrical
 130 portion, rotary beater-arms provided with beaters at their outer ends, an annular cover supported on said beater-arms extending with its upper contracted end upwardly to the interior cylindrical portion of the screen-cover, an exterior casing provided with a cover located at some distance above the top of the screen-cover, and a central hopper in said casing-

cover for the supply of material to be ground, substantially as set forth.

2. In a grinding-mill, the combination, of a stationary grinding-plate, having a circumferential grinding-disk, lugs at the exterior of the grinding-disk, upright straps attached to said lugs, a cylindrical screen attached to said upright straps, a screen-cover attached to the upper ends of said straps and provided with an interior downwardly-extending cylindrical flange, rotary beater-arms, beaters at the ends of the same, an annular cover supported on the said beater-arms and ex-

tending upwardly into the downwardly-extending cylindrical flange of the screen-cover, an exterior casing, a cover for said casing at some distance above the screen-cover and a central hopper supported on said casing-cover, substantially as set forth. 15

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses. 20

MAX F. ABBÉ.

Witnesses:

PAUL GOEPEL,

HENRY J. SUHRBIER.