

(No Model.)

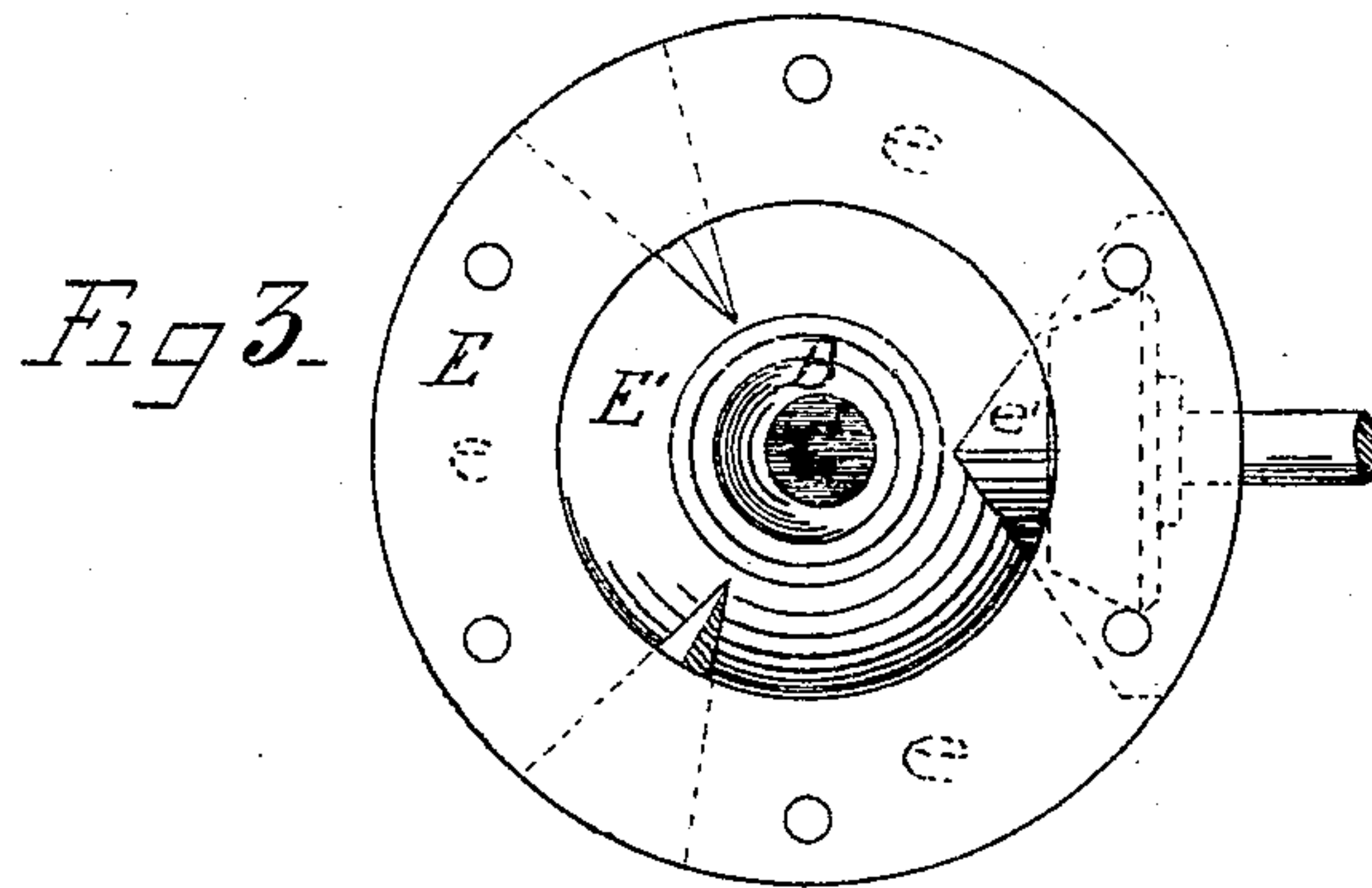
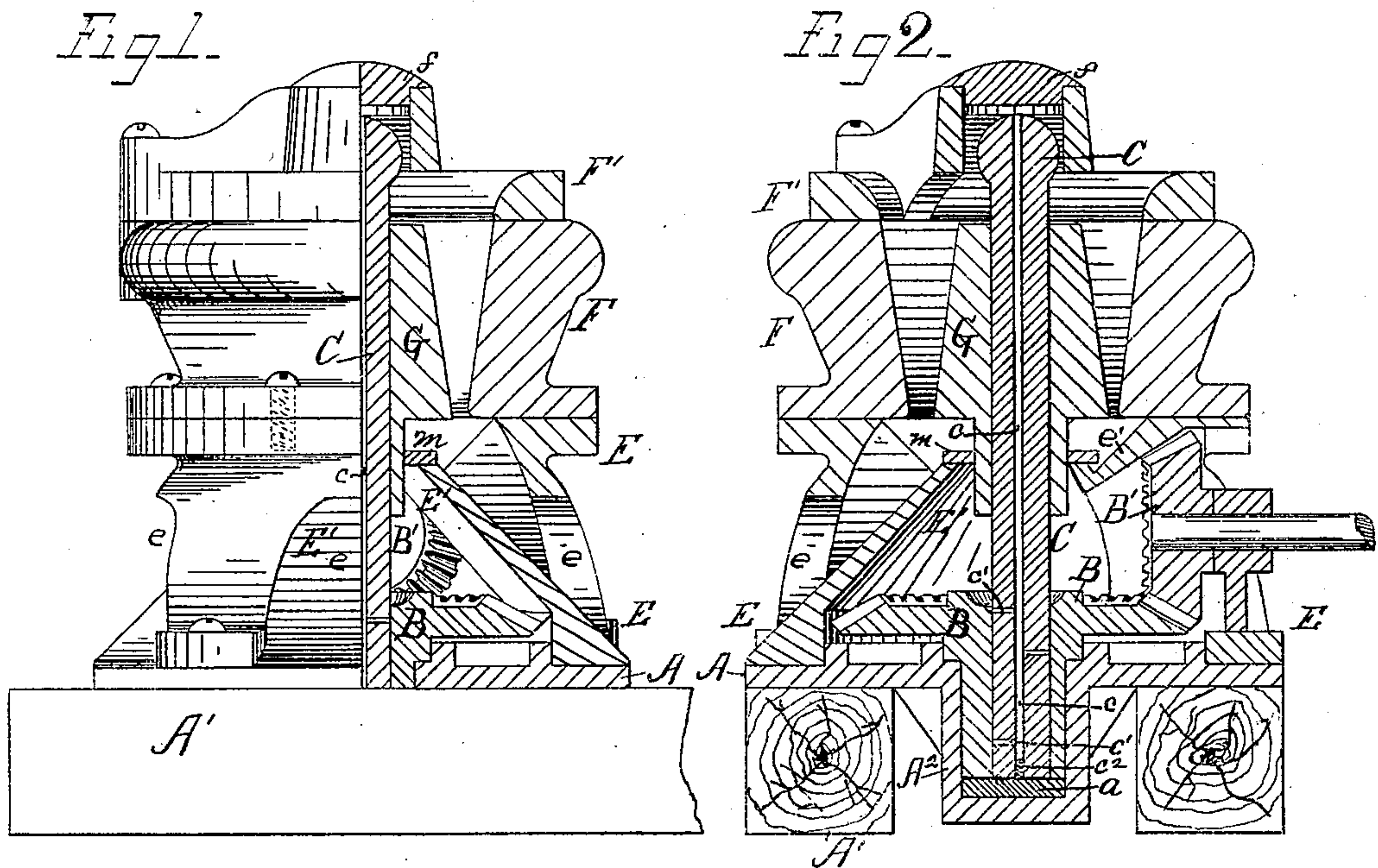
2 Sheets—Sheet 1.

H. H. SCOVILLE.

ORE CRUSHER.

No. 253,231.

Patented Feb. 7, 1882.



WITNESSES—  
J. Everett Brown  
J. M. Munday.

INVENTOR—  
Hiram H. Scoville,  
By Munday, Evans & Ascock  
his Attys.

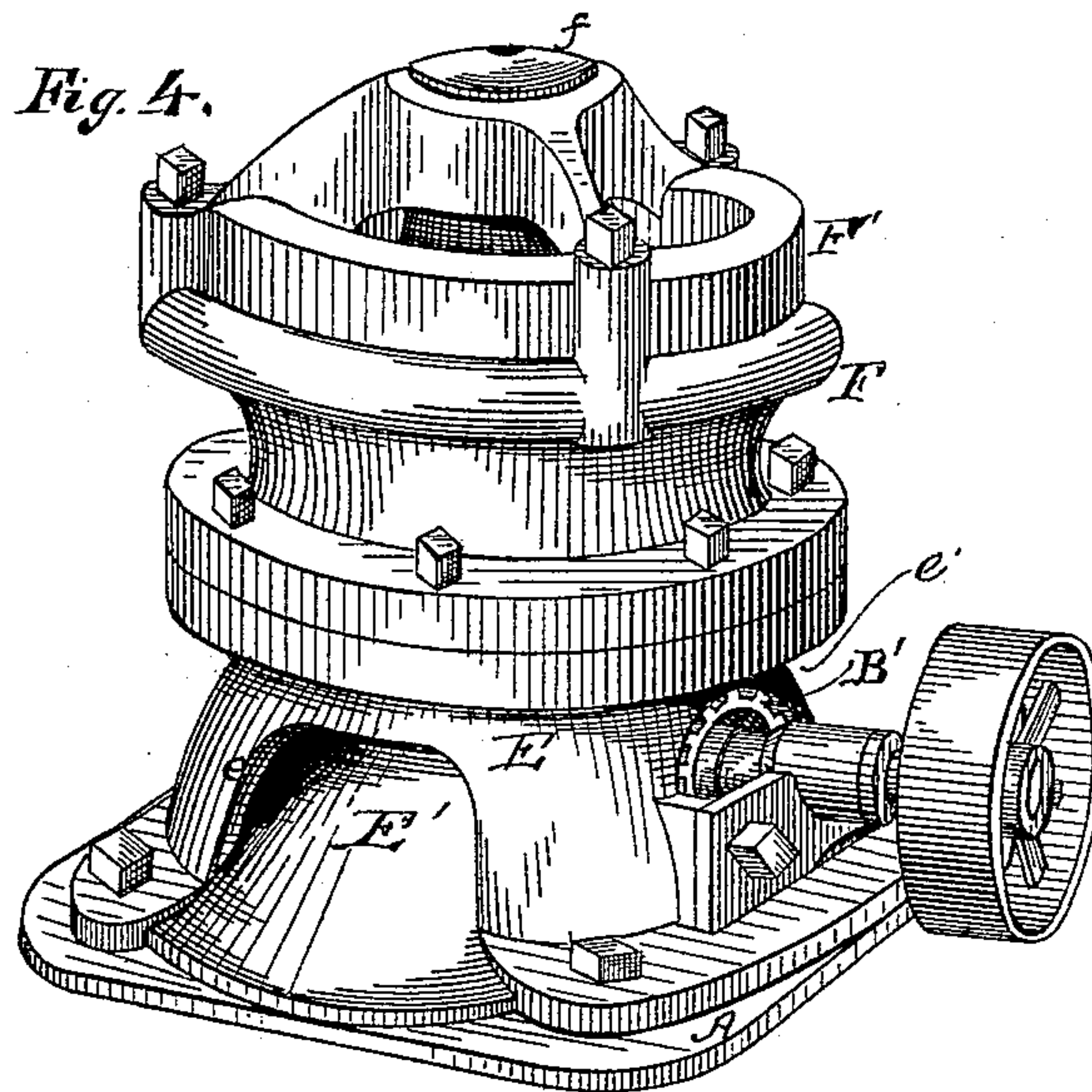
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2 Sheets—Sheet 2.

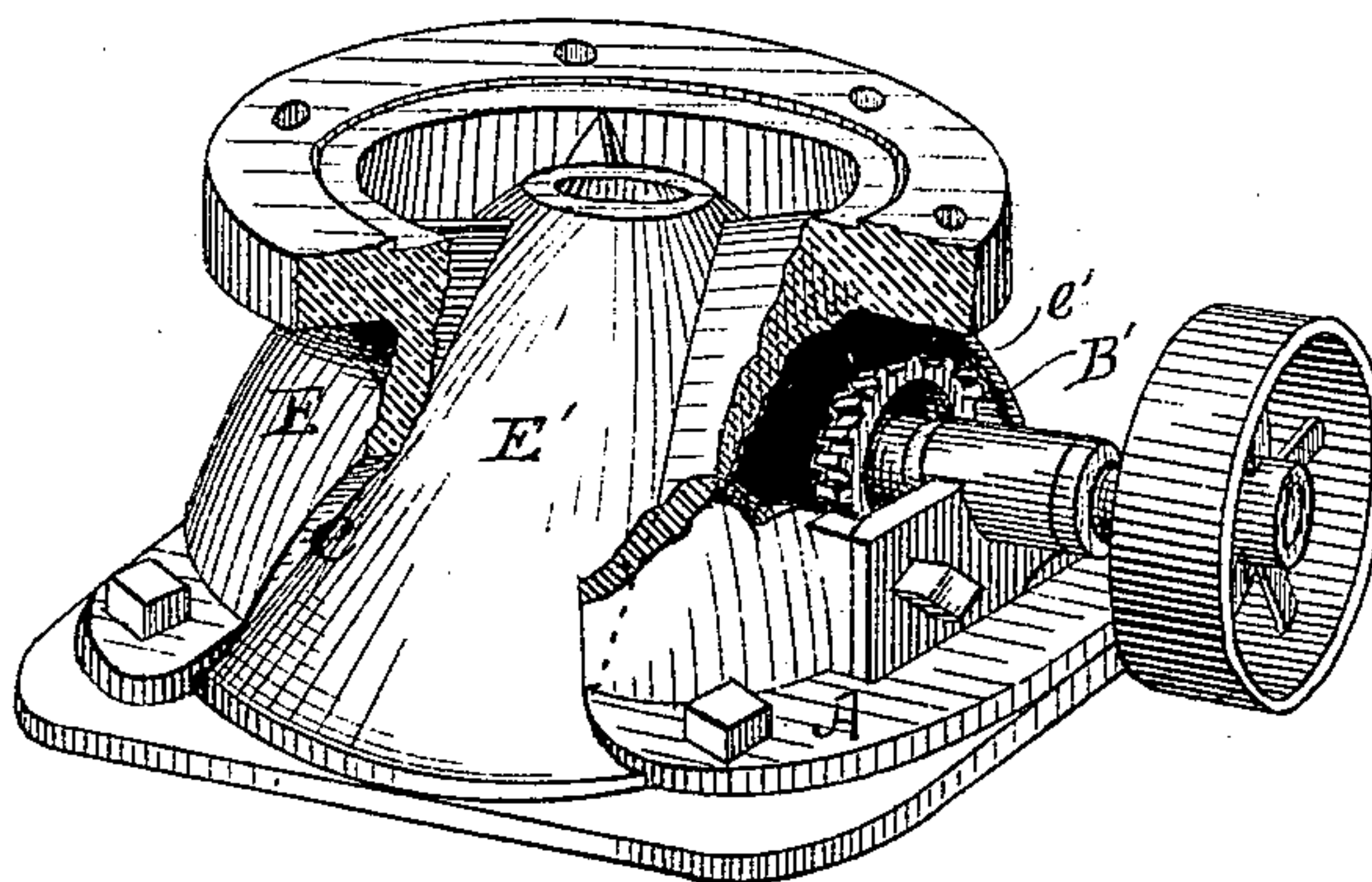
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*Fig. 5.*



Attest

*Aug<sup>2</sup> Jordan*  
*E. C. Ford*

Inventor  
*H. H. Scoville*  
By his atty  
*R. D. O. Smith*



# UNITED STATES PATENT OFFICE.

HIRAM H. SCOVILLE, OF CHICAGO, ILLINOIS, ASSIGNOR TO FRASER & CHALMERS, OF SAME PLACE.

## ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 253,231, dated February 7, 1882.

Application filed October 20, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, HIRAM H. SCOVILLE, of Chicago, Cook county, State of Illinois, have invented certain new and useful Improvements in Ore-Crushers, of which the following is a specification.

This invention relates to the class of ore-crushers set forth in the Reissued Letters Patent of the United States No. 3,633, to James W. Rutter, dated September 7, 1869, and concerns the construction of the apron and discharge-chutes of the apparatus, the gyrating shaft or spindle, and the frame. In Rutter's device the crushing is continuous, by the gyrations of a conical crusher, over the inner surface of a stationary cylinder or grinder. The ground or crushed stone is discharged through a continuously-advancing narrow opening as the crusher revolves; but the ground material being angular fragments of stone do not escape freely, as smooth rounded bodies would do. The difficulties of free discharge are not removed by the inclined chute, such as shown in Brown's patent, (herein elsewhere referred to,) which collects the ground material from all sides of the grinder and conducts it to a single place of discharge at one side of the machine. This method of discharge is common in machines of this character.

The first part of my invention provides a complete remedy by securing an uninterrupted and free discharge on all sides over an ever-widening path over a conical skirt which receives the material near its apex and discharges it from its base.

The second part of my invention is designed to perfect the bearing-step for the gyrating shaft and the lubrication of the same.

The third part of my invention is designed to improve the structure with a view to economy of manufacture and transportation, and durability of mechanism.

Figure 1 is a partial side elevation and partial vertical section of my improved apparatus. Fig. 2 is a vertical section of the same, taken upon a line at right angles to the sectional portion of Fig. 1. Fig. 3 is a horizontal section upon the line immediately beneath the crushing devices. Fig. 4 is a perspective view of my

machine. Fig. 5 is a perspective view of the lower section of the same, partly broken away.

Similar letters of reference indicate like parts.

In the drawings, A represents a bed-plate adapted to the timber-supports A', and provided with a central socket, A<sup>2</sup>, wherein the hub of the horizontal bevel-gear B, by which the shaft C is gyrated, is inserted, and upon the bottom of which, or upon an interposed steel surface, a, said shaft is supported.

B' is a bevel-gear intermeshing with the gear B, and is the medium by which the latter is actuated. The gear B is perforated through its hub to receive the shaft C, and such perforation is located out of center, so that the shaft is gyrated as the gear revolves, in the same manner as in said Rutter's invention.

To provide adequate and convenient facilities for oiling the shaft C at its lower end, where it is in frictional contact with the gear and the bottom of the socket A<sup>2</sup>, a central longitudinal opening, c, extending from end to end, is made in it, and from this extend a number of lateral openings, c'. The oil is fed at the top of the shaft to the opening c, and finds exit at the points needed through the lateral openings c'.

E is the lower section of the frame, resting upon the bed-plate A. Located within it and around the shaft is a conic frustum, E', which serves to catch the crushed ore and to conduct it away through the openings e in the part E. Of these openings three are shown, which will ordinarily be sufficient; but the number is not material. It will be observed that when the ground material passes from between the grinding-surfaces it immediately falls free into a more ample space, and as it slides down the surface of the conical skirt its path is a continually-widening one, wherein it cannot become clogged. Upon the side where the wheel B' is located a raised portion, e', is employed to give room to said wheel; but that of course would not be necessary if the wheel were dropped to a lower plane. Under this frustum the gears are entirely protected from debris from the crushing devices; and in order to more perfectly insure this, the shaft is encir-



cled by a washer, *m*, which rests upon the apex of the frustum, and moves about thereon as the shaft gyrates.

5 F is the middle section of the frame, between the interior of which and the cone G the crushing takes place.

10 F' is the upper section of the mill, wherein is located the bearing of the ball end of the shaft. A cap, *f*, covers the opening over the shaft. By dividing the parts E and F of the frame, as shown, convenient access is afforded to the interior of the frame for repairs, and the transportation of the mill is rendered more easy, as the parts can be handled with much  
15 greater facility than if both of said parts are inseparably united. In the usual manner of constructing these mills this division cannot be made.

20 The skirt or frustum may be integral with the frame or separate therefrom, as the judgment of the constructor dictates. I am aware of the construction shown in patent to C. M. Brown, of March 26, 1878, No. 201,646, and disclaim the same.

25 The bottom of the shaft-opening *e* is preferably closed by a steel step or plug, *e*<sup>2</sup>, to prevent undue use of oil.

I claim—

1. The ore-crusher provided with the conic frustum-skirt for conducting away the crushed ore freely and protecting the actuating-gears, substantially as and for the purpose set forth. 30

2. The ore-crusher provided with a hollow vertical gyrating shaft, C, having openings for the emission of the oil fed to the interior thereof, combined with the rotating step-gear B, having an eccentric socket for said shaft C, and a stationary socket-hub, A<sup>2</sup>, wherein said wheel B has its bearing, and the foot-plate *a*, substantially as specified. 35 40

3. The ore-crusher the frame whereof is divided into sections E, F, and A, whereof section F contains the grinding-surfaces, section E contains the conic frustum-skirt, and the section A contains the hollow hub wherein is the bearing for the operative mechanism, substantially as described. 45

HIRAM H. SCOVILLE.

Witnesses:

H. M. MUNDAY,

WILLIAM J. CHALMERS.

It is hereby certified that Letters Patent No. 253,231, issued February 7, 1882, upon the application of Hiram H. Scoville, for an improvement in "Ore Crushers," were improperly granted to Fraser & Chalmers, as owners of the entire interest by assignment from said Hiram H. Scoville; whereas it appears by assignments upon record in this Office that said Fraser & Chalmers were assignees of one-half only of said Scoville's interest, and that the said Letters Patent should have been granted to said Hiram H. Scoville jointly with said Fraser & Chalmers; that the proper corrections have been made in the files and papers pertaining to the case in the Patent Office, and are hereby made in said Letters Patent to make the title therein conform to the records of the Office.

Signed, countersigned, and sealed this 14th day of February, A. D. 1882.

[SEAL.]

A. BELL,

*Acting Secretary of the Interior.*

Countersigned:

E. M. MARBLE,

*Commissioner of Patents.*