No. 841,921. PATENTED JAN. 22, 1907.

O. C. BEACH & A. L. BUZZELL.

COMBINED PULVERIZER AND SAMPLER.

APPLICATION FILED MAR. 21, 1906.

2 SHEETS—SHEET 1.

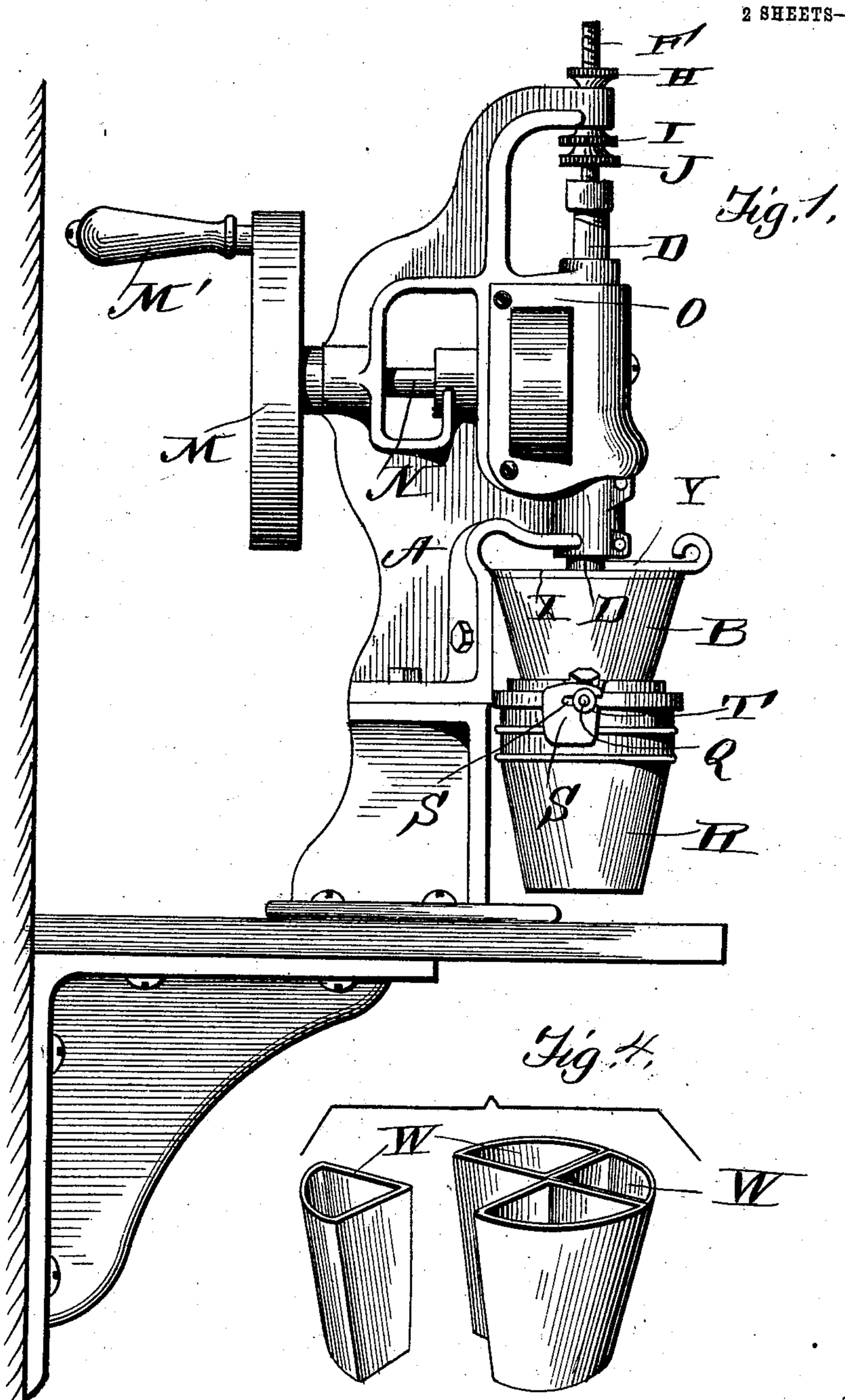

Fig. 1.

Fig. 4.

Witnesses

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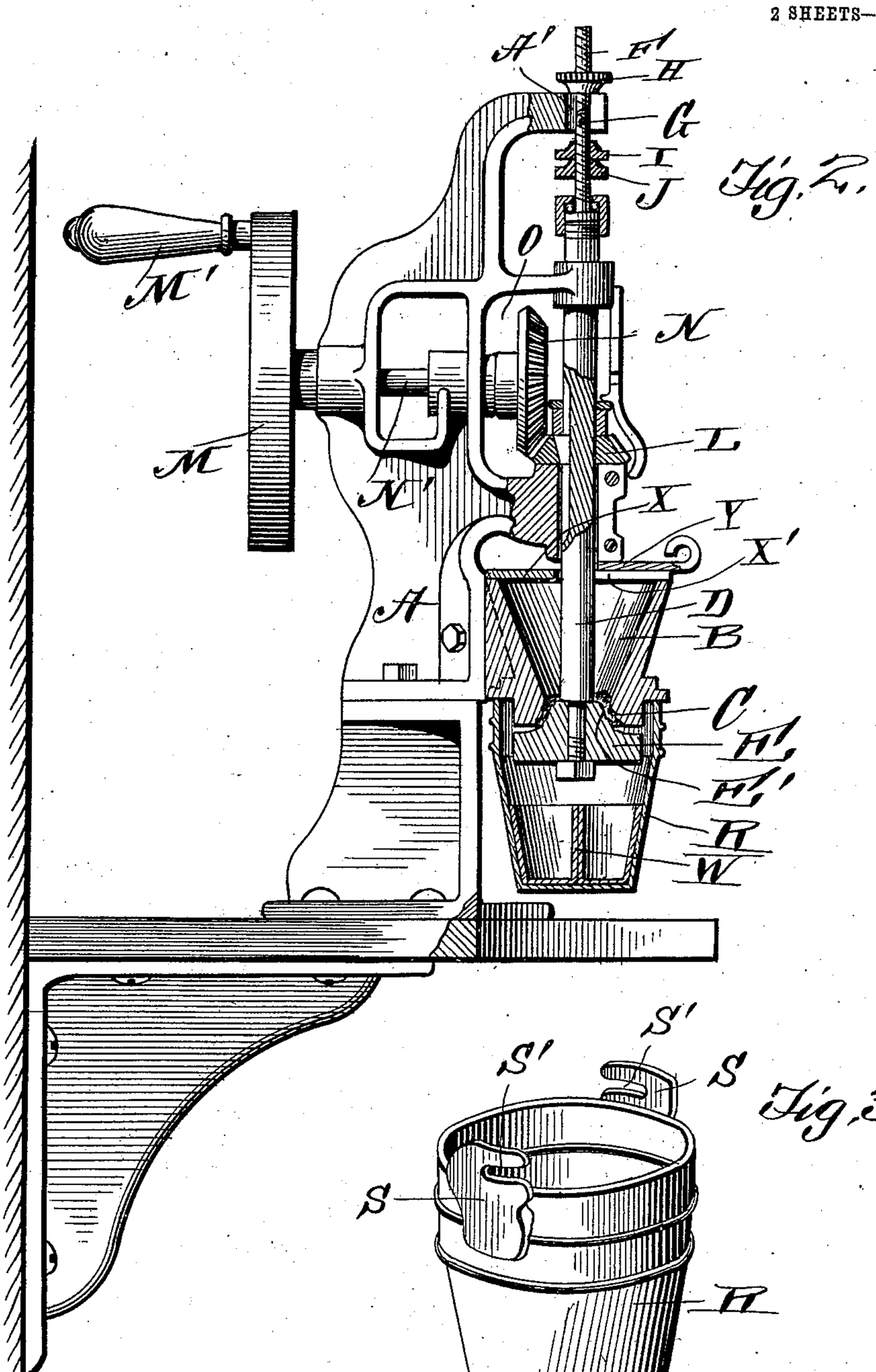

Fig. 2.

Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

OSCAR CLARENCE BEACH AND ARTHUR LEE BUZZELL, OF LOS ANGELES, CALIFORNIA, ASSIGNORS, BY MESNE ASSIGNMENTS, TO FREDERICK W. BRAUN, OF LOS ANGELES, CALIFORNIA.

COMBINED PULVERIZER AND SAMPLER.

No. 841,921. Specification of Letters Patent. Patented Jan. 22, 1907.

Application filed March 21, 1906. Serial No. 307,242.

To all whom it may concern:

Be it known that we, OSCAR CLARENCE BEACH and ARTHUR LEE BUZZELL, citizens of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in a Combined Pulverizer and Sampler; and we 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in apparatus for pulverizing frangible material and simultaneously quartering the same, if desired; and the object of the invention is to produce a machine in which the grinding-plates are held in horizontal planes, one of which is vertically adjustable, being held by means of a knuckle-joint having suitable ball-bearings and so arranged that the grinding-surfaces may be adjusted for any degree of fineness.

The invention consists in various details of construction and combinations and arrangements of parts, as will be hereinafter fully described and then specifically defined in the appended claims.

We illustrate our invention in the accompanying drawings, in which—

Figure 1 is a perspective view of our invention. Fig. 2 is a vertical sectional view centrally through the apparatus. Fig. 3 is a perspective view of a receptacle for receiving the pulverized material, and Fig. 4 is a detail view showing the dividing-cups positioned therein.

Reference now being had to the details of the drawings by letter, A designates a standard made, preferably, of metal and supports a hopper B, which is tapering, and to the lower end of said hopper is fastened one of the stationary grinding-plates C, which has a central opening with a tapering marginal wall to said opening. D designates a shaft which passes centrally through said opening and is mounted vertically and passes centrally through said opening. A grinding-disk E is fixed to the lower end of said shaft and has upon its upper surface a tapering portion E′, which is corrugated and adapted to conform to the tapering margin of the opening in the grinding-plate C. Said shaft, which is mounted in suitable bearings in the frame of the apparatus, has swiveled to its upper end a threaded rod F, having ball-bearings, and to said rod is pivoted a knuckle-joint G, which is designed to engage the slot A′, formed in the overhanging portion of the frame of the apparatus. An adjusting-nut H is mounted upon said knuckle-joint G and is adapted to bear against the upper end of the frame, as shown clearly in the drawings, whereby the shaft may be held in an adjusted position. An adjusting-nut I is mounted upon said threaded rod, which has swiveled connection with the shaft, and a jam-nut J is also mounted upon the threaded portion of said rod and is adapted to bear against the adjusting-nut I. Fixed to said shaft is a gear-wheel L, which is adapted to mesh with a bevel-gear N within the casing O, said gear N being fixed to the shaft N′, which is journaled in suitable bearings in the frame of the apparatus. A balance-wheel M is fixed to the end of the shaft N′ and is provided with a handle M′.

Projecting from the opposite marginal edges of the flange about the lower end of the hopper are two screws Q, and R designates a receptacle which may be of any size, but which in the drawings is shown as having a tapering circumference, and S S designate ears upon said receptacle, having slots S′ reversely arranged, said slots being provided to receive the screws upon the flange at the lower end of said hopper, and retaining-nuts T are mounted upon said screws, whereby the receptacle may be held in place. W W designate quartering-cups, which when placed together in the manner shown in the drawings have their outer convexed circumference of conical shape adapted to conform to the taper of said receptacle and in which they rest and completely fill the lower portion of the receptacle, thereby causing the material being pulverized to be divided into four equal parts for sampling purposes. X designates a cover to said hopper, having an opening X′ formed therein, and Y designates a lid hinged to said cover and adapted to close over said aperture, whereby material may be fed into the hopper.

In operation, the parts being assembled in place as shown, the grinding-plates are regulated to the degree of fineness at which it is desired to have the mineral reduced by simply raising or lowering the shaft by means of the adjusting-nuts, which will cause the two plates to be nearer together or farther apart, as may be desired. The pulverized material falling through the aperture in the stationary plate is thrown out by centrifugal force between the two plates and falling into the receptacle beneath is equally distributed into the quartering-cups for sampling purposes.

When it is desired to separate the grinding-plates sufficiently to allow the same to be cleansed or for other purposes, the adjusting-nut at the top of the knuckle-joint may be loosened and the knuckle-joint swung out of the slot at the top of the frame, and the shaft will lower by gravity, giving access to the wheels after the receptacle has been removed by first taking off the adjusting-nuts which hold the receptacle, said receptacle being removed by imparting a slight rotary movement to the same sufficient to free the slotted ears from the screws.

From the foregoing it will be observed that by the provision of the apparatus shown and described a simple and efficient means is afforded for reducing minerals to any degree of powdered state by the simple adjustment of the nuts, regulating the distance between the two grinding-plates, and so constructed that easy access may be had at any time to the grinding-plates for cleansing or other purposes, while the receptacle fastened to the hopper and provided with its quartering-cups affords means whereby the product may be divided into equal parts for sampling purposes.

What we claim is—

1. An apparatus for pulverizing and dividing frangible materials, comprising a frame having a laterally-extending arm which is provided with an open slot, a stationary grinding-plate having an opening therein, a screw positioned in said slot and provided with a head at its lower end, a nut mounted upon said screw and resting upon said slotted arm, a vertically-mounted shaft swiveled to said head, a grinding-plate fixed to the bottom of said shaft, and means for rotating the latter, as set forth.

2. An apparatus for pulverizing and dividing frangible materials, comprising a frame, a stationary grinding-plate having an opening therein, a hopper, a vertically-adjustable shaft, means for supporting the same, a grinding-plate fixed to the bottom of said shaft, screws projecting from the flange of said hopper, a receptacle having ears with oppositely-disposed slots therein adapted to receive said screws, nuts upon said screws for holding the receptacle in place, and dividing-cups within said receptacle, as set forth.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

OSCAR CLARENCE BEACH.
ARTHUR LEE BUZZELL.

Witnesses:
SAMUEL L. BOECKEL,
M. ELIZA DOXIE.