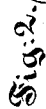


J. A. SPERRY.

No. 266,397.

Patented Oct. 24, 1882.



M. F. Boyle.  
B. E. Stafford.

Inventor:  
James A. Sperry

by his attorney  
Thomas L. Sutton

# UNITED STATES PATENT OFFICE.

JAMES A. SPERRY, OF BROOKLYN, NEW YORK, ASSIGNOR TO FRANK SPERRY AND EUGENE SPERRY, BOTH OF SAME PLACE.

## QUARTZ CRUSHER AND PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 266,397, dated October 24, 1882.

Application filed December 29, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES A. SPERRY, of Brooklyn, Kings county, in the State of New York, have invented certain new and useful  
5 Improvements relating to Quartz Crushers and Pulverizers, of which the following is a specification.

My improved pulverizer acts by the aid of one or more balls of chilled iron or other suitable material traversed around in a casing of the same or other suitable hard material, crushing the stone by the action of the ball or balls thereon. The improvements relate to the provisions for driving and properly controlling the ball, while giving great freedom for the accommodation thereof to the masses of material treated, and to certain scrapers which are provided in advance of the ball and insure the presentation of only a certain quantity of the  
20 rock to such action at any one time.

I will describe the machine as operating with two balls mounted to traverse always on opposite sides of the central shaft; but it will be understood that I can use a greater number  
25 with a corresponding number of cages or housings therefor, or even one alone may serve, if desired.

The accompanying drawings form a part of this specification, and represent what I consider the best means of carrying out the invention.  
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Figure 1 is a vertical section. Fig. 2 is a transverse section. Fig. 3 is a horizontal section of a portion on the line S S in Fig. 1.

Similar letters of reference indicate like parts in all the figures.  
35

A is a fixed casing, of cast-iron or other suitable material, certain portions of which will be distinguished, when necessary, by additional  
40 figures, as A', A<sup>2</sup>, &c. A' is a broad flange, serving as a base. A<sup>2</sup> is an enlargement of the diameter near the mid-width to receive removable pieces A<sup>3</sup>, which are presented to the direct grinding action of the material being pulverized by the action of the balls thereon. A<sup>4</sup>  
45 A<sup>4</sup> are sides, or, rather, ends. The general form of the case is a hollow cylinder of short length and large diameter, with its axis horizontal.

B is a shaft mounted in fixed bearings and  
50 turned by a steam-engine or other suitable

power. It lies in the axial line of the casing A, and is provided with stout arms, which perform important functions. Each arm will be lettered C, certain other portions being marked by additional characters, as C' C<sup>2</sup>, when necessary to distinguish them. C' is a concave  
55 portion near and at the extremity of the arm. C<sup>2</sup> is a broad web, contributing to the stiffness and strength of the arm, and C<sup>3</sup> are removable pieces of chilled iron or other suitable hard  
60 material, which are brought into direct and forcible contact with the ball D in driving it strongly and rapidly around within the case. Each piece C<sup>3</sup> is secured within the concave C' by bolts C<sup>4</sup> and nuts C<sup>5</sup>. Although in work-  
65 ing the concave part C' or the hard lining C<sup>3</sup> thereof is usually pressed against the ball D to compel it to move against the resistance offered by the quartz or other material being treated, there are conditions, especially when  
70 the machine is running slow or stopped, where the ball is liable to become displaced by moving forward too far. This is guarded against by a removable concave, C<sup>6</sup>, bolted strongly to the arm C by the bolts and nuts C<sup>11</sup> C<sup>12</sup>. The  
75 two concaves C' and C<sup>6</sup> together cage or loosely inclose the ball D, allowing it a little motion in all directions, and providing a liberal space for it to move inwardly toward the shaft B whenever the stony material *m* shall be able to  
80 resist the weight and momentum of the ball and shall compel it to do so. The front face of C<sup>6</sup> is a broad flange, C<sup>8</sup>, which is connected with the arm C by a web, C<sup>7</sup>. Upon the face C<sup>8</sup> is secured by bolts C<sup>9</sup> and nuts C<sup>10</sup> an ad-  
85 justable scraper, E. The bolts C<sup>9</sup> stand in slots in the face C<sup>8</sup> or in the adjustable part E, or in both, to allow the adjustment to be made with any required amount of space between the outer end of E and the inner sur-  
90 face of the case A. The back of the concave portion C' is open in the center of its width, as plainly shown in Figs. 2 and 3.

In the use of the machine a sufficient speed is imparted to hold each ball D out with  
95 some force against the interior of the case A even in the highest part of its circuit. In the lowest portion of its path it acts on the material between itself and the case A with its weight and its centrifugal force, and also with what  
100

may be termed still more strictly its "momentum"—the indisposition to change its path suddenly. Altogether it acts with great force to break, crush, and pulverize. The machinery is strong and unusually simple. In case of failure of any part through breakage, wearing out, or other causes, access is readily obtained for repairs. The main portions exposed to destructive wear are exchanged by manipulating the nuts by an ordinary wrench and removing the fastening-bolts.

Modifications may be made in the forms of the several details.

The number of the balls may be changed, as stated, and the sizes and weights greatly varied.

Parts of the invention may be used without the whole.

I can dispense with the scrapers E E; but I greatly prefer to retain them. They serve an important end in removing any excess of the material *m* in advance of the ball, which is able, by acting on a relatively thin layer, to traverse around in a nearly perfect circle, disintegrating the hard masses very effectually.

The material to be pulverized may be supplied through the passage G by hand or by machinery. The fine particles, when sufficient-

ly reduced, may be taken away on the same side or the opposite side through any suitable aperture. (Not shown.)

The machine may be used either as a wet or dry pulverizer. In using it as a wet pulverizer there may be screens of any desired mesh applied in any suitable position to detain the coarse and discharge the fine material.

I claim as my invention—

1. The two concaves C' and C<sup>6</sup> and removable fastenings C<sup>11</sup> and C<sup>12</sup>, in combination with the ball D, arm C, shaft B, inclosing-case A, and suitable means for impelling the shaft, as herein specified.

2. In a quartz-pulverizer, the scraper E, flange C<sup>3</sup>, and means for adjustably securing said scraper, in combination with the ball D, concaves C' and C<sup>6</sup>, the case A, and the shaft B, as herein specified.

In testimony whereof I have hereunto set my hand at New York city, State of New York, this 15th day of December, 1881, in the presence of two subscribing witnesses.

JAMES A. SPERRY.

Witnesses:

CHARLES R. SEARLE,  
B. E. D. STAFFORD.