

G. Mitchell,

Ore Mill.

No. 106,271.

Patented Aug. 9. 1870.

Fig. 2.

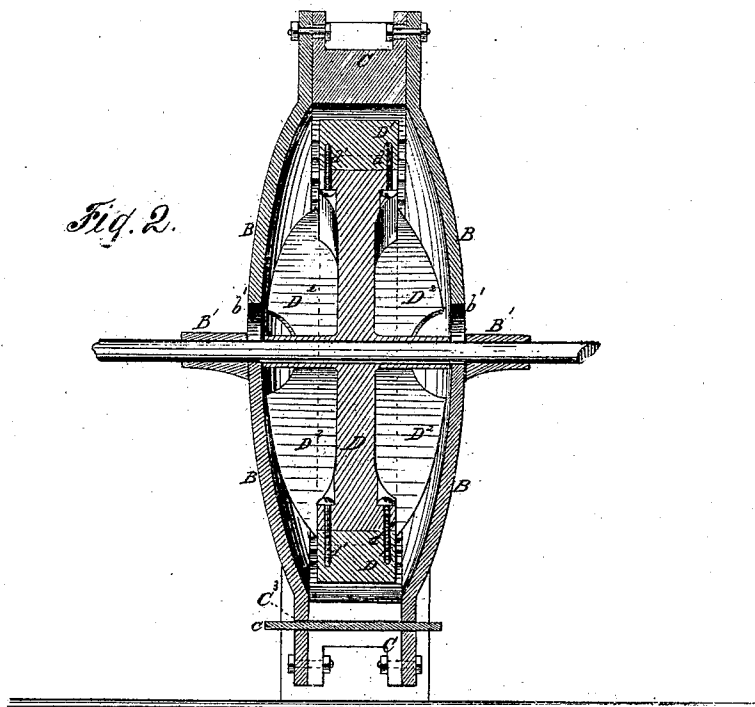
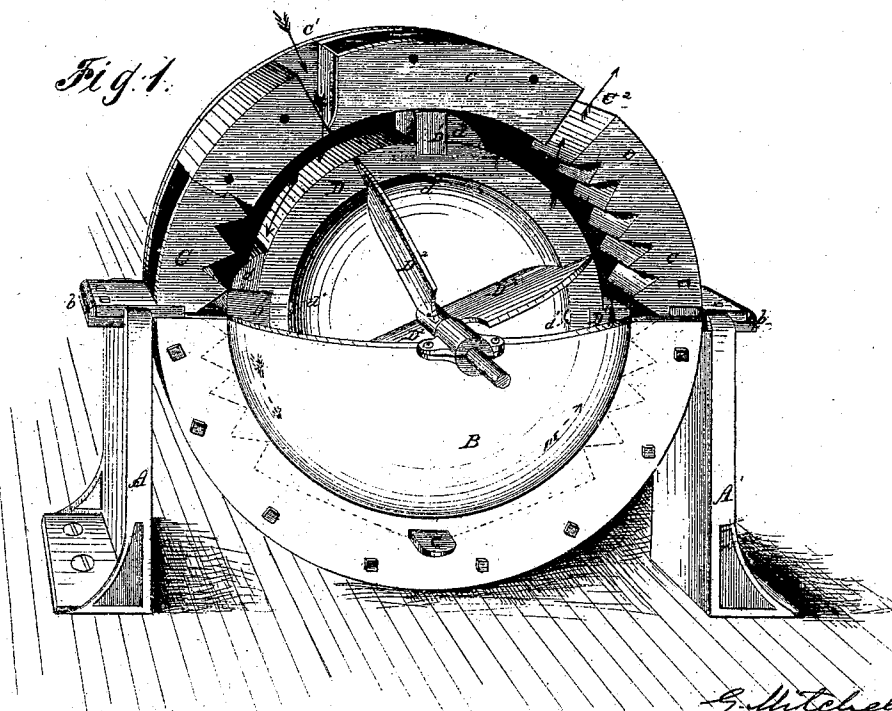


Fig. 1.



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UNITED STATES PATENT OFFICE.

GOVE MITCHELL, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN GRINDING-MILLS.

Specification forming part of Letters Patent No. **106,271**, dated August 9, 1870.

To all whom it may concern:

Be it known that I, GOVE MITCHELL, of the city and county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Mills for Grinding Quartz, Guano, Phosphates, and other hard substances; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawing, making part of this specification, in which—

Figure 1 represents a perspective view of the machine, one of the semicircular plates, constituting the half of a head of the casing, being broken away to show the wheel, with its hammers and fanning-flanges, and the construction of the segments of which the rim of such casing is composed. Fig. 2 is a vertical transverse section.

The same letters are used in both figures to designate identical parts.

The object of my invention is to so construct a mill for grinding quartz, phosphates, &c., that it shall first reduce the substances fed into it to a pulverulent or powdered state, and then discharge the substances thus reduced by a blast of air.

To this end my improvements consist in the construction, combination, and arrangement of sundry parts of the mill, as will more fully appear from the following description and claims.

To enable those skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A A' in the drawing represent two standards or frames, upon which the machine is to be mounted. Such frames may be of the construction shown, or of any other form adapted to receive and support the mill.

The grinding or pounding wheel is to be inclosed in a metallic casing, which I propose to construct in sections, for the purpose of the proper adjustment of the parts, as well as to provide for an easy and cheap mode of repairing the machine if any of its parts become fractured or worn out. Thus the heads of the casing may be made of semicircular plates B B, &c., which are united together in pairs by the flanges *b* cast on them, and by which flanges the upper and lower halves of such

heads are then to be secured together by suitable bolts. These heads are to be made of a dished form, so as to afford a suitable space within the casing to the fanning-flanges of the grinding-wheel. B' B' are boxes cast centrally upon or secured at that point to the heads of the casing, forming suitable bearings for the wheel-shaft. Apertures *b'* are provided in the heads for the admission of air to the fans.

C C, &c., represent segments of a circle, of which segments the rim of the casing is composed. They are made to fit snugly between the heads, to which they are secured by bolts; and to allow of the proper adjustment of them with reference to the grinding-wheel the holes in them, through which these bolts pass, are elongated, so that, by loosening the nuts, such segments can be set nearer to or farther from the wheel, as may become necessary.

The interior surfaces of the segments upon the sides of the wheel are of a ratchet or serrated form, as clearly shown in Fig. 1, into the recesses of which the substances to be ground or powdered are forced by the hammers of the grinding-wheel, and out of which recesses they continually slide in the intervals between the departure of one and the arrival of the next succeeding hammer, to be continually acted upon until they are reduced to the required fineness, in which state such substances are taken up by the blast and discharged from the machine. These serrated segments are to be made of steel or chilled cast-iron, to prevent their too rapid wear.

Suitable openings, C¹ and C², are left between adjoining segments in the upper portion of the rim of the casing, through the former of which the substances to be reduced are fed into the mill, and, when thus reduced, discharged through the latter, as indicated by the arrows in Fig. 1.

Another opening, C³, is left in the bottom portion of the rim, ordinarily closed by a slide, *c*, which is withdrawn when it becomes necessary to clean the mill.

D represents the grinding or pounding wheel, which is mounted upon a shaft having its bearings in the boxes B', through which it projects, to receive upon one end a balance-wheel, and upon the other end a pulley or

other device for revolving it and the wheel. Upon the periphery of this wheel are secured, at suitable intervals, the hammers D¹, made of steel or chilled cast-iron. They are dove-tailed into the wheel, and backed by bosses *d* formed thereon, and held in position by screws *d'*.

The number of hammers to be employed depends upon the size of the wheel.

Cast upon or secured to both faces of the grinding-wheel, which may be dished from the rim to the center, as shown, are the flanges D², forming fans, by which a blast of air is generated in the casing upon each side of the wheel on its revolution, by which blast the substances, when properly reduced, are discharged from the mill.

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

1. The combination, in a mill for grinding quartz, phosphates, &c., of the revolving wheel, with removable hammers and fanning-flanges, and an inclosing casing, the rim of which is composed of adjustable segments, some of which are serrated upon their inner surfaces, substantially as herein set forth.

2. The wheel D, constructed with removable hammers D¹ and fanning-flanges D², substantially as and for the purposes set forth.

3. In combination with the wheel D, the adjustable serrated segments C, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GOVE MITCHELL.

Witnesses:

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ALFRED DUVAL.