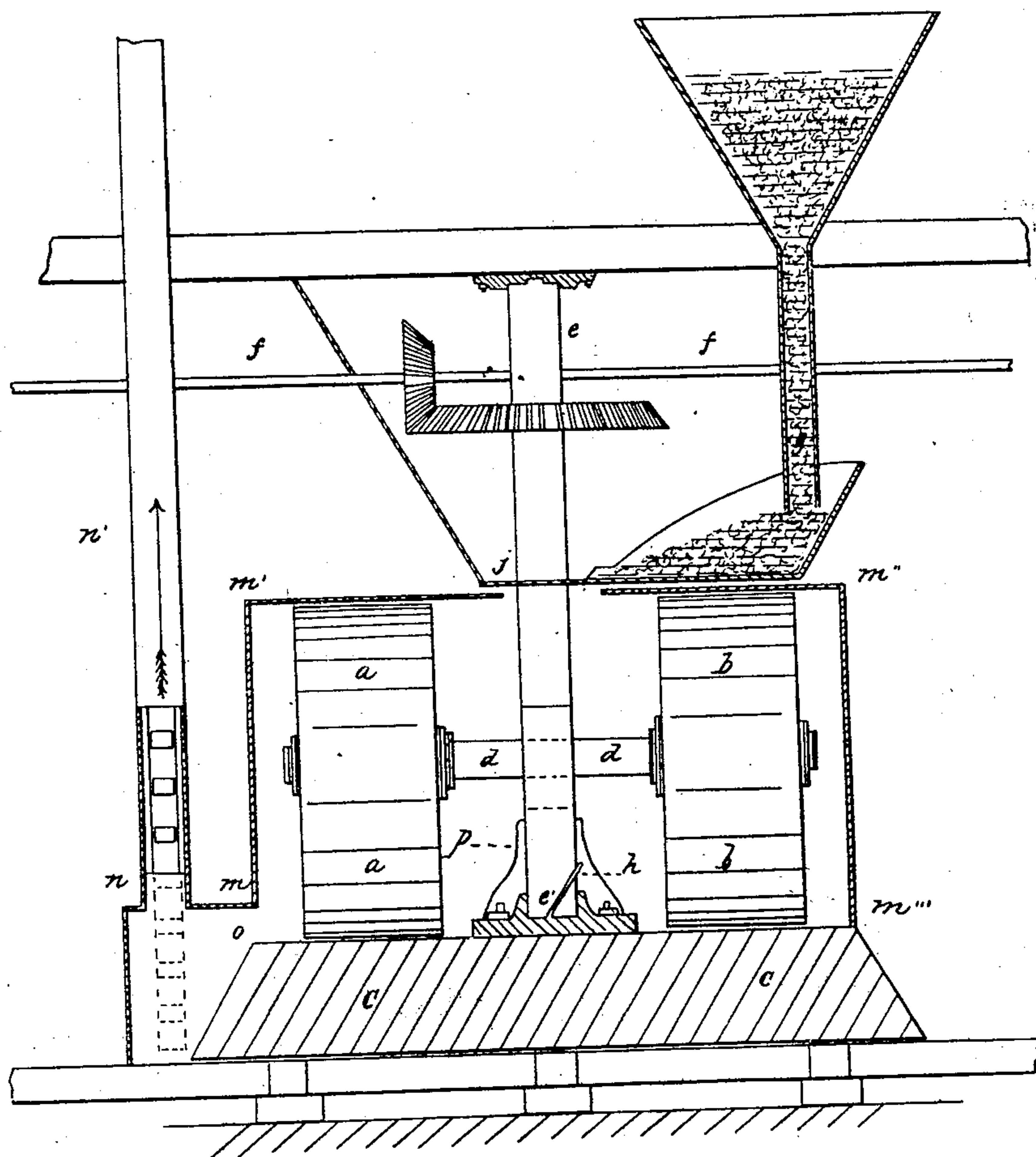


G. F. WILSON.  
GRINDING AND PULVERIZING ACID PHOSPHATES.  
No. 75,333.                      Patented Mar. 10, 1868.



WITNESSES.

*William Hodge*  
*Winslow Warren Jr*

*Geo. F. Wilson*

# United States Patent Office.

GEORGE F. WILSON, OF EAST PROVIDENCE, RHODE ISLAND.

*Letters Patent No. 75,333, dated March 10, 1868.*

## IMPROVEMENT IN GRINDING AND PULVERIZING ACID PHOSPHATES.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE F. WILSON, of East Providence, in the county of Providence, and the State of Rhode Island, have invented a new and improved Method of Grinding Horsford's Acid Phosphate of Lime; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

The object of my invention is to reduce to powder the acid phosphate, which, while brittle at common temperatures, is rendered adhesive by the heat produced in the use of ordinary millstones, and, sticking to the stones, soon cements them together and arrests the grinding. I have experimented with the conical iron mill, with polished cylinders, and burr, and other stones, but all have failed, because of the heat developed in continuous pulverization.

The nature of the invention consists in the interrupted crushing of the granulated acid phosphate, by which time is given for the powder to cool. The device by which the object is effected consists of a bed-stone on which, standing on their curved edges like wagon-wheels, are two short stone cylinders, attached to the opposite ends of an axle, which axle passes through an upright shaft midway between the two stone cylinders. By revolving the upright shaft, the stone cylinders are swept round at the extremities of the axle, describing orbits having a radius equal to half the length of the axle, and producing an effect compounded of the pressure of a rolling cylinder on a plane surface, and the slipping of a curved surface on a plane surface.

These motions slowly reduce the granulated acid to powder, while the time required for the wheel to revolve allows the heat developed by the pressure and pulverization to dissipate, so that the acid does not become hot enough to be rendered adhesive, as is the case in grinding between ordinary millstones. As the stones revolve a scraper follows, stirring up the acid and increasing the cooling effect.

The accompanying drawing illustrates the relations of the parts and their mode of operation.

*a a* and *b b* are short stone cylinders, standing on their curved surfaces. *c c* is the bed-stone. *d d* is the axle on which the stone cylinders revolve. *e e'* is the upright shaft, resting on the bed-stone at *e'*, having its oblique oil-tube *h* and its leathern hood *p*. Through the shaft *e e'* passes the axle *d d*. *f f* is the line of shafting, communicating motion to the upright shaft by bevel-wheels, and through it to the axle *d d*, and the stone cylinders *a a* and *b b*.

The practical operation of the mill is as follows: Through the chute *g* the dried granulated acid is fed from a hopper above, as received from the drying-chamber, described in my application for a patent of even date herewith, of which acid a uniform supply is maintained by the jigger *j* attached to the chute. The acid falling, as used in grain-mills, between the cylinders, passes under them, and is crushed and rubbed by them to powder. The parts of the surface of the stones, interior to what may be the point of continuous simple contact without sliding, slip backward, while those exterior to it slip forward, at the same time imparting a total centrifugal and forward motion to the powder, carrying it before and beyond the stones against the casing *m m' m'' m'''* on one side of which, at *o*, there is an overflow, where the powdered acid leaves the bed-stone to be taken up by elevators *n n'* and carried to the bolt. The coarser particles separated by the bolt are returned by elevators to be recrushed. The cylinders may be faced with iron, or wholly of iron, the object being to gain an interval of time between successive crushing effects or impacts in the process of grinding.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. An improved process of disintegrating and pulverizing the dried and granulated mixture of acid phosphate of lime and farinaceous matters, substantially in the manner and for the purposes described, whereby the heating thereof is prevented, by causing the pulverizing action of the mill to be applied to any particular portion of the mixture to be at intervals, which allow time for cooling between successive impacts.

2. I also claim the application of the above-described apparatus to the pulverization of acid phosphate of lime mixed with farinaceous matters, substantially as above described.

Witnesses:

WILLIAM HEDGE,  
WINSLOW WARREN, Jr.

GEO. F. WILSON,