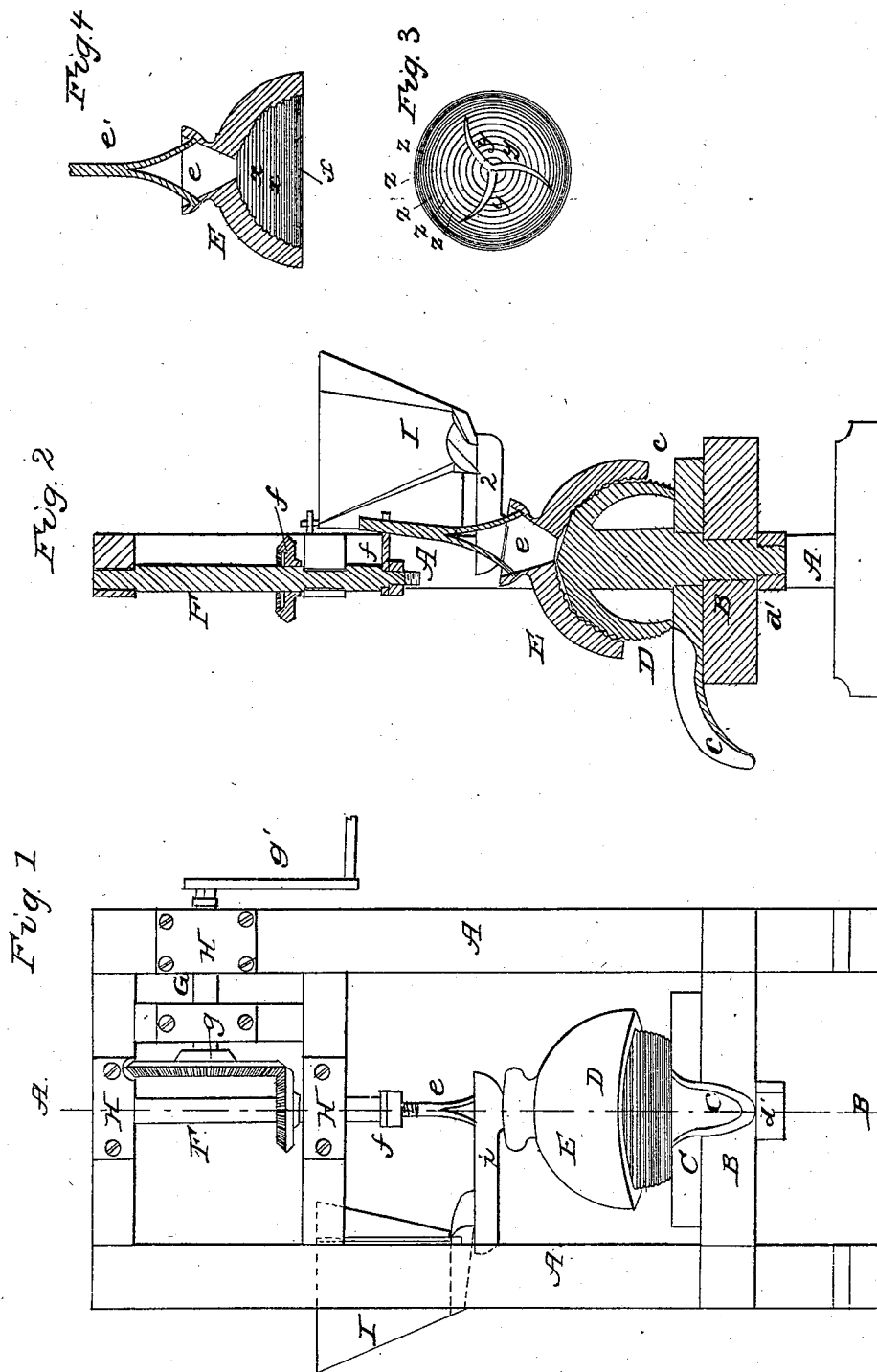


J. F. OSTRANDER.

Grain Mill.

No. 4,478.

Patented April 25, 1846.



# UNITED STATES PATENT OFFICE.

J. F. OSTRANDER, OF NEW YORK, N. Y.

## GRINDING-MILL.

Specification of Letters Patent No. 4,478, dated April 25, 1846.

*To all whom it may concern:*

Be it known that I, JONATHAN F. OSTRANDER, of the city of New York, in the State of New York, have invented a certain  
5 new and useful Improvement in Mills; and I do hereby declare that the following is a full, clear, and exact description thereof.

The nature of my invention consists in making the surfaces of the stones, or metallic plates, between which the material is ground, the one convex and the other concave—the convexity and concavity being hemispherical, or of the form of spherical segments; and also in giving the movable  
10 plate, or stove, a compound motion, consisting of, firstly, an oblique gyrating motion of its axis around the axis of the fixed plate, and, secondly, a rotating motion around its own axis. These motions will be more fully  
20 understood from the following description of a mill for grinding paint and other substances. In this mill the stationary part is a truncated sphere of metal, consisting of more than a hemisphere: it is fastened firmly  
25 upon the platform of a frame of wood, or iron, by a pin passing through the platform and secured upon the under side by a nut:—its position is such that the flat side rests upon the platform, leaving the hemisphere  
30 opposite projecting upward. In order to give a clearer idea of the construction and operation of the mill it will be necessary to consider this truncated sphere as having an axis, and that the axis is perpendicular to  
35 the plane, or truncated, side and, consequently, in a vertical position. The movable part of the mill is a hollow hemisphere, which, for distinction, I shall call the shell: it rests upon and incloses the hemisphere of  
40 the stationary part and it is between the surfaces thus in contact that the paint is ground. The upper part of the shell is provided with an opening of a cup or funnel shape through which the paint is fed to  
45 the mill. The surface of the hemisphere is cut into furrows, circular and concentric with the axis, or like parallels of latitude upon a geographical globe, and 2 or 3 cross furrows are cut in it, beginning at the pole  
50 and extending partly down the sides of the hemisphere, for the better distributing of the paint over the grinding surfaces; the interior of the shell is also cut into furrows, circular and concentric with the axis;—  
55 when speaking of the axis of the shell I mean that semidiameter which is perpen-

dicular to the plane formed by the base of the shell. Motion is imparted to the shell through a rod, or handle, which surmounts it and extends upward in the direction of its  
60 axis; the upper end of the handle passes through a hole in the end of a short arm extending at a right angle from an upright shaft; this shaft also carries a bevel wheel, into which gears another wheel carried by a  
65 horizontal shaft, and this latter shaft terminates in a winch, or crank, to which the power is applied. Both shafts work in bearings attached to the frame of the mill. The upright shaft coincides exactly with the  
70 axis of the stationary hemisphere, hence, when the handle of the shell is inserted in the arm extending from the shaft, as described, the shell will be thrown off of its center, so to speak, or its axis will not coincide  
75 with the axis of the stationary hemisphere but will be oblique to it, and when the upright shaft is made to revolve it will give the handle, and of course the axis of the shell; an oblique gyrating motion around the  
80 axis of the stationary hemisphere; and there will also be given to the shell a rotating motion around its own axis—this latter motion resulting from the former one and from the pressure of the shell upon the sta-  
85 tionary hemisphere conjointly.

The paint is fed to the mill by being placed in the cup shaped opening in the top of the shell, before described, and the ground paint is received in a gutter sur-  
90 rounding the base of the stationary hemisphere. When the mill is used to grind dry substances it is furnished with a hopper, hung to the frame by hinges: the material is put into the hopper and from thence  
95 fed to the mill by a gutter leading to the opening in the top of the shell.

Description of drawings hereto annexed, illustrating my invention, and forming part  
100 of this specification.

Figure I side elevation of a mill for grinding paint and other substances. Fig. II sectional elevation of the mill through the line A, B. Fig. III top view of the stationary hemisphere. Fig. IV side view  
105 of a section of the shell through the center.

A frame of wood to which the several parts of the mill are attached. B platform upon which the truncated sphere, or stationary part of the mill, rests. C gutter sur-  
110 rounding the base of the truncated sphere and terminating in a spout (c) to lead away

the contents of the gutter. D the truncated sphere, from which a bolt ( $d$ ) passes through the platform and is secured on the under side by a nut ( $d'$ ). The surface of the spherical part is cut into furrows ( $z$ ) circular and concentric with the axis, and those are crossed by three furrows ( $y$ ) beginning at the crown of the hemisphere and extending a short distance down the sides.

10 E the shell, or hollow hemisphere, forming the movable part of the mill. It is provided with a funnel shaped opening ( $e$ ) at the top through which the paint is fed to the mill, and with a handle ( $e'$ ) by which

15 motion is imparted to it. The interior surface is cut into furrows ( $x$ ) circular and concentric with the axis. F an upright shaft which carries at its lower end an arm ( $f$ ) through a hole in which the handle of the

20 shell passes, the hole being sufficiently large for the handle to play freely within it. The shaft also carries a bevel wheel ( $f'$ ) through which it derives motion. G a horizontal shaft carrying at one end a bevel wheel ( $g$ )

25 which gears into the wheel upon the upright shaft; and provided at the other end with a winch ( $g'$ ) to which the power for oper-

ating the mill is applied. H bearings in which the shafts work. I a hopper with which the mill is provided when it is used to 30 grind any substances. The material is fed to the mill by a gutter ( $i$ ) leading from the hopper to the opening in the top of the shell.

What I claim as my invention and desire 35 to secure by Letters Patent is—

The making of the surfaces of the stones, or metallic plates, between which the material is ground, the one convex and the other concave—the convexity and concavity being 40 hemispherical or of the form of spherical segments—and giving the movable plate, or stone, a compound movement consisting of the following motions viz. an oblique gy- 45 rating motion of its axis around the axis of the fixed plate, and of a rotating motion around its own axis, substantially as herein described, the whole forming a mill for grinding paint, grain, &c.

JONATHAN F. OSTRANDER.

Witnesses:

GEO. D. BALDWIN,  
P. F. STIRLING.