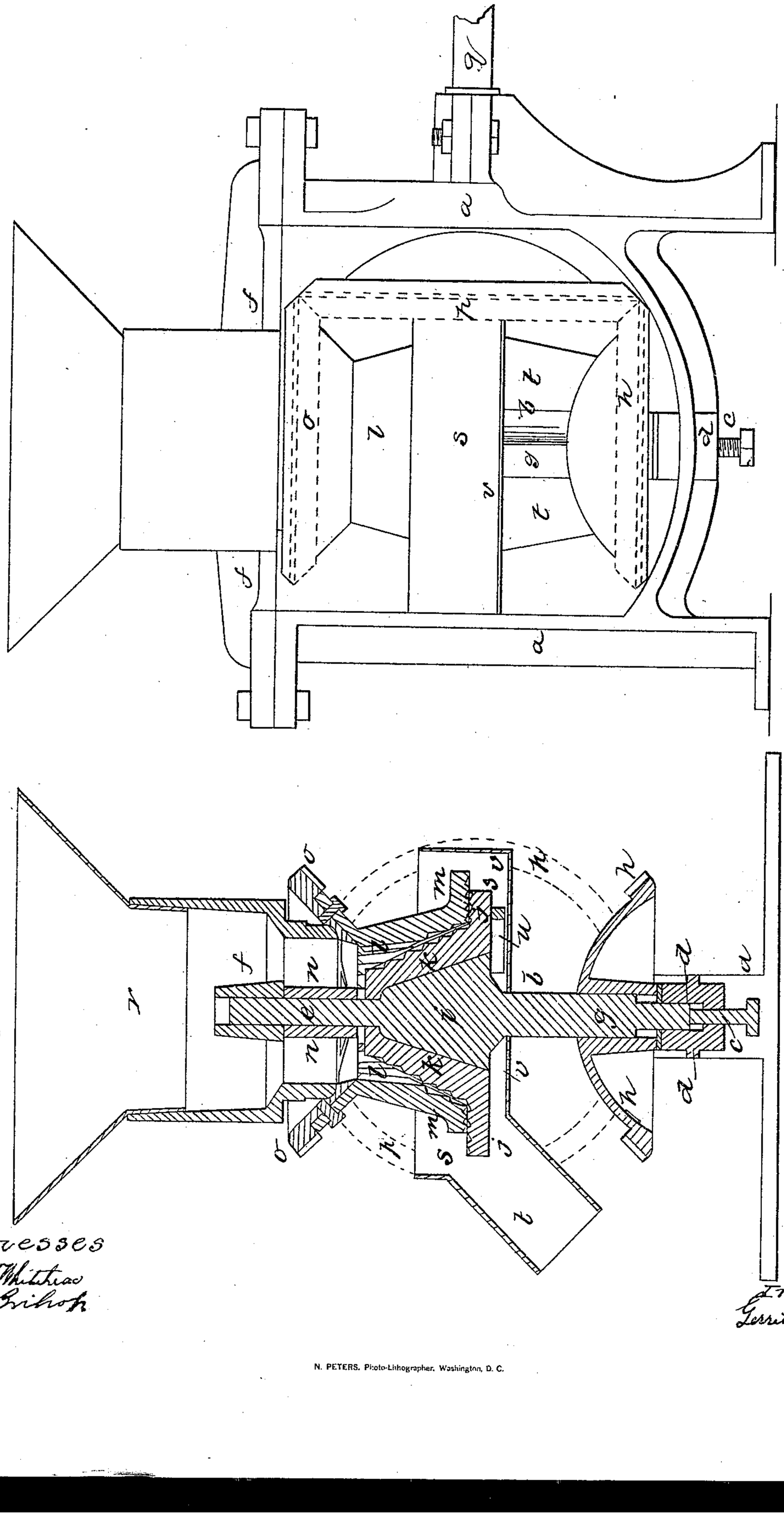
G. ERKSON.

Grinding Mill.

No. 20,941. Patented July 20, 1858.



Witnesses
Harris Whittemore
Wm. H. Gilbert

Inventor
Gerrit Erkson.

UNITED STATES PATENT OFFICE.

G. ERKSON, OF NEW YORK, N. Y.

GRINDING-MILL.

Specification of Letters Patent No. 20,941, dated July 20, 1858.

To all whom it may concern:

Be it known that I, GERRETT ERKSON, of New York city, N. Y., have invented a certain new and useful Improvement in Mills for Grinding Various Substances; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is an elevation of the mill; and Fig. 2, a vertical section thereof.

The same letters indicate like parts in both figures of the said drawings.

My invention relates to the construction of mills for grinding or reducing all kinds of substances which are usually reduced by the process of grinding; and my said invention consists in combining with and attaching to two eccentric rotating plates having the same axis of rotation and turning in opposite directions, or in the same direction but with different velocities, and whose contiguous surfaces are formed or otherwise prepared for grinding and reducing substances, a male and female nut one within the other, and concentric with each other, for the purpose of breaking or crushing the substances which are passed between and finally ground or reduced between the surfaces of the eccentric plates.

In the accompanying drawings *a* represents a suitable frame, and *b* a vertical shaft with a journal at the lower end and fitted to, and controlled by a cross tree *d* with the extreme end of the said shaft resting on an adjusting set screw *c*. The upper end *e* of the said shaft is cylindrical and fitted to turn in an upper cross cup *f* of the frame, in such manner that it can be elevated or depressed by the set screw which acts as a step. The lower part *g* of the said shaft above the lower journal is made square or feathered to the eye of a horizontal bevel cog wheel *h* by which it is rotated while at the same time it, (the shaft) can be adjusted up or down through the eye of the wheel which has its hub resting on a suitable boss on the cross tree. Above the square part *g* the said shaft is enlarged as at *i*, in the form of an eight (more or less) sided pyramid, with the upper portion thereof slightly rounded and this enlarged part enters the eye of the lower eccentric plate *j* and the nut *k* which are made in one piece, and this connected plate and nut rests on the rounded part of this pyramid, there being a slight play between the sides of the pyramid and the eye that the nut and eccentric plate may be free to oscillate to a sufficient extent to enable the grinding surface of the eccentric plate to adapt itself to the under surface of another eccentric plate, to be presently described, while at the same time the sides of the pyramid on the shaft shall drive the eccentric plate and nut. The nut *k* is concentric with the shaft and made in the general form of, and with, breaking teeth substantially in the manner of a coffee mill and other mill nuts, but the plate *j*, which forms the base of the nut, is eccentric and of greater diameter, and with its upper flat surface formed with suitable furrows or teeth or otherwise formed to suit the kind of grinding to which the mill is to be applied.

Above the nut *k* is a female nut *l* suited to the male nut *k* and concentric therewith, and the base of this female is formed with another eccentric plate *m* the converse of the one *j*. The upper end of the eye of the female nut *l* is connected by arms with a central hub *n* fitted freely to the cylindrical part of the shaft, so that it can turn thereon by means of a bevel cog wheel *o* attached to the upper edge of the nut. The upper end of the hub *n* works under the cross cap *f* to hold down the female nut and its eccentric plate. Motion is imparted in opposite directions to the two nuts and their eccentric plates by a bevel cog wheel *p* in a horizontal driving shaft *q;* the male nut *k* and its eccentric plate receiving motion in one direction directly from the shaft, while the female nut and its plate are turned in opposite direction on the shaft by the bevel cog wheel on its upper rim.

The substance to be ground is supplied in a hopper *r* which conducts it through the eye of the female nut to be broken between the two nuts, which, as before stated are concentric, and thence the substance so broken passes between the two concentric plates which, by reason of their eccentricity and rotation in opposite directions, reduce it to any extent desired, according to the nature of the furrows or teeth or other dressing of the surfaces of the plates and the adjustment to which they are set by the set screw, the lines of action of the two surfaces passing each other in a manner never before obtained in any other mill with which I am acquainted. The substance when

reduced is discharged from the periphery of the eccentric plates into a surrounding curb *s* provided with a discharge spout *t* to which the substance is carried for delivery by a scraper *u* projecting from the under surface of the eccentric plate *j* and which sweeps around over the bottom *v* of the curb.

It will be obvious from the foregoing that the teeth or other dressing of the two nuts and the grinding surface of the two eccentric plates may be made in any manner suited to the nature of the substance intended to be ground or reduced, and that if the nuts and eccentric plates are desired to be rotated in the same direction but at different velocities that the gearing must be differently arranged, and in a suitable manner well known to machinists.

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

Combining with the two eccentric grinding plates having the same axis of rotation, substantially as described, a male and female nut, concentric with each other, and attached to, and rotating with the eccentric plates, as set forth, and for the purpose specified.

GERRETT ERKSON.

Witnesses:
HENRY WRITEHEAD,
WM. H. BISHOP.