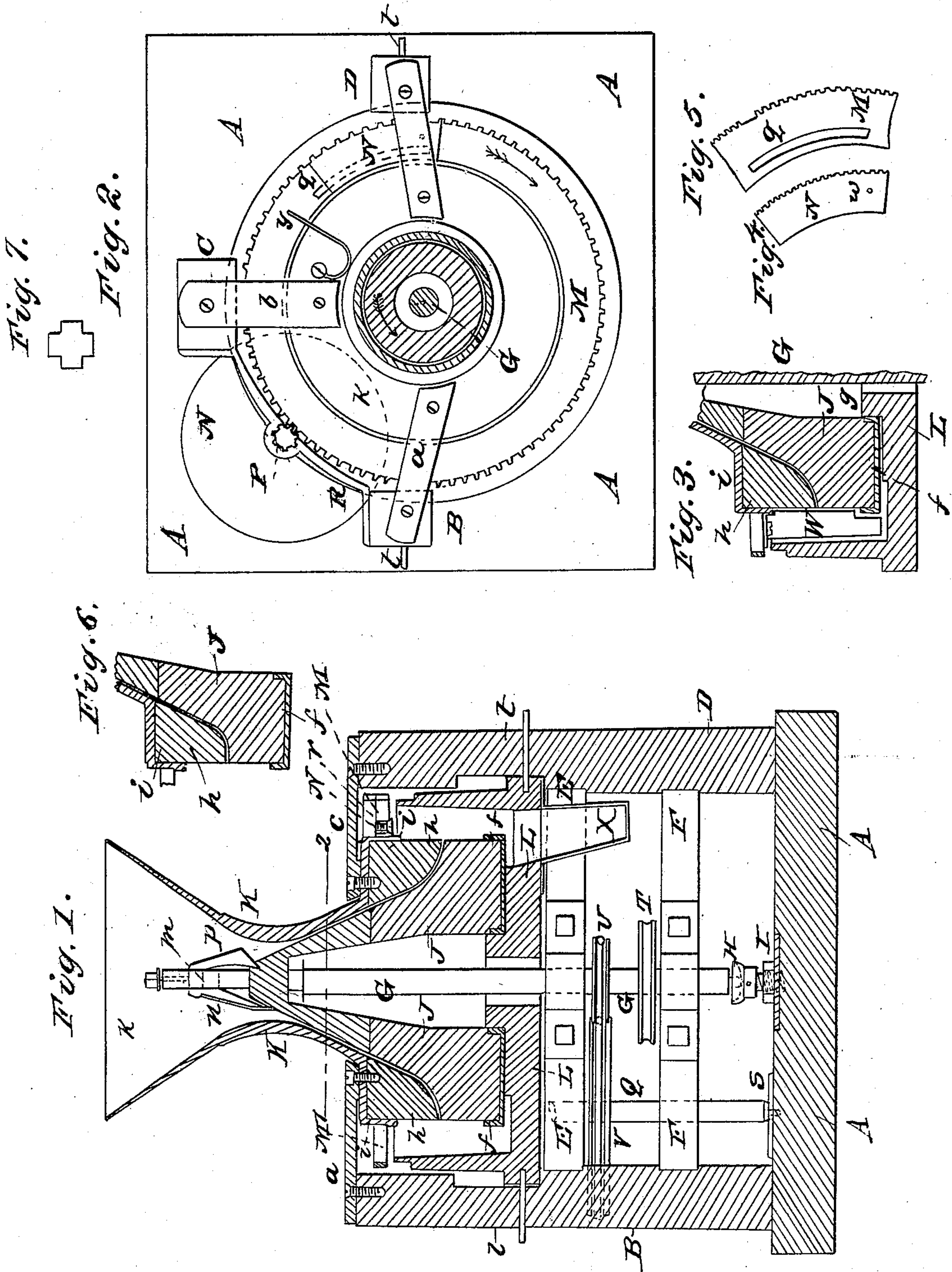


D. E. BREINIG.
Grinding Mill.

No. 19,826.

Patented April 6, 1858.



UNITED STATES PATENT OFFICE.

DAVID E. BREINIG, OF PHILADELPHIA, PENNSYLVANIA.

GRINDING-MILL.

Specification of Letters Patent No. 19,826, dated April 6, 1858.

To all whom it may concern:

Be it known that I, DAVID E. BREINIG, of the city of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Grinding-Mills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

My invention relates to mills for grinding paints, printer's ink, drugs, grain, and other materials and consists in constructing the shell and bur with their upper surfaces cone-shaped, with inclined sides terminating in a horizontal grinding surface, in combination with arms for directing the material toward said grinding surfaces, and, also in combination with the above mentioned form of grinding surface, a scraper driven by a system of gearing described hereafter, whereby the ground material is allowed full liberty to escape, and is yet prevented from flying off.

In order to enable others skilled in the art to make and use my invention I will now proceed to describe its construction and operation.

On reference to the drawing which forms a part of this specification, Figure 1, is a sectional elevation of my improved mill as adapted for grinding paints; Fig. 2, a sectional plan on the line 1—2 Fig. 1; Fig. 3, a detached sectional view showing the operations of the scraper; Fig. 4, a detached view of the sliding toothed segment; Fig. 5 a detached view of part of the wheel connected to the scraper; Fig. 6 a sectional view showing a modified form of shell and bur; Fig. 7 a view of the top of the spindle.

The same letters of reference allude to similar parts throughout the several views.

A is the foundation of the mill on which are erected the three upright pieces B, C and D. Between the uprights are secured the two brackets E and F in which turns the main spindle G of the mill. This spindle rests and revolves in the footstep or socket H, the latter screwing into the plate I which is secured to the base A. The top of the spindle is furnished with a cross shaped head (see Fig. 7) which fits into a similarly shaped recess on the inside of the bur J. The upper portion of the latter is constructed of metal, and the lower part of any of the stones used for grinding purposes. The

lower portion rests in the annular socket *f* through the central opening of which passes the hub *g'*, on the bottom of the trough L. The shell K, of which the upper portion *k* forms the hopper of the mill, is secured to the upright pieces B, C, and D by means of the strips *a*, *b*, and *c*, the lower portion of the shell having a flanch *i* which forms a recess for the reception of the stone *h*. The metal portions of the shell and bur are furnished with teeth of the usual form. I propose to make the upper portion of the grinding surface of the shell and bur cone shaped, the inclined sides terminating with a gentle or abrupt curve (as seen in Figs. 1 and 6) in a horizontal or partially horizontal surface.

The top of the bur is furnished with a spindle *m* projecting into the hopper *k*, and to this spindle are secured the two arms *n* and *p* the former being nearly straight, and the latter curved.

Around the flanch *i* fits loose the wheel M in one portion of the periphery of which the teeth are cut away as seen in Fig. 5. Through the wheel, and in the neighborhood of the point where the teeth are cut away is a curved slot *q*, into which fits a similarly shaped projection *r* on the underside of the segment N so that the teeth of the latter may coincide with those of the wheel. A pinion P, of sufficient depth to gear into the teeth of both wheel and segment, is secured to the top of the spindle Q which turns, at the top in the bracket R on the uprights B and C, and at the bottom in a plate S attached to the base A.

T is the driving pulley on the main spindle, U another pulley around which as well as around the pulley V on the spindle Q passes a cord or strap.

To the underside of the wheel M is secured the scraper W, the form and position of which, as regards the shell, bur, and trough is seen in Fig. 3. The trough is secured by bolts or pins *t*, *t*, *t*, to the uprights B, C, and D, and in the bottom of the trough is an opening communicating with the spout X.

Operation: The material to be ground being introduced into the hopper *k*, the bur is driven in the direction of the arrow, the wheel M with its scraper W and segment N taking a contrary direction. The straight arm N on the spindle *m* serves the purpose of agitating the material in the hopper, and

the deflecting arm p to force it toward the teeth on the upper portion of the shell and bur, the combined action of these teeth break up the material preparatory to the same being acted upon by the grinding surface of the stones. When the point of the wheel M where the teeth are cut away, and where the segment is situated, arrives at the pinion P, the wheel ceases to revolve, as the pinion however gears into the segment, the latter moves independent of the wheel until its projection r reaches the end of the curved slot q at which point the teeth of the segment coincide with those of the wheel, so that both continue to revolve together as before, until a projection w on the segment comes in contact with the point of the spring y which retains the segment until the opposite end of the slot comes in contact with the projection r ; the point of the spring y becoming released from contact with the projection w , the wheel and segment continue their course together until the point where the teeth are cut away again arrives at the pinion P when the above described movements are repeated. It will be now seen that a temporary stoppage of the wheel M, and consequently of the scraper takes place at every revolution. The scraper is so situated that when this stoppage takes place its edge coincides with the edge of the opening in the trough L, thus affording sufficient time for the ground material, accumulated during one revolution, to escape. By causing the breaking of the material or rather the coarser grind-

ing to be effected by conical surfaces, and the finer grinding or levigating to be accomplished by partially horizontal surfaces, I find the work is not only more rapid, but also more effective.

The curve at the junction of the horizontal with the inclined grinding surfaces may be more or less abrupt according to the nature of the material to be ground, and although I have shown these grinding surfaces in the present instance as composed partially of metal and partially of stone, I do not intend to confine myself to the union of these two substances, as the shell and bur for grinding some materials may be made of metal only.

I claim and desire to secure by Letters Patent:

1. The upper portion of the grinding surface of the shell and bur, cone shaped, with inclined sides terminating in a horizontal or curved grinding surface, in combination with the deflecting arms n and p , or their equivalents.

2. The shell and bur, formed as above described, in combination with the scraper W, sliding segment N and pinion P, arranged and operating substantially as described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

D. E. BREINIG.

Witnesses:

HENRY HOWSON,
ALFRED MONNIER.