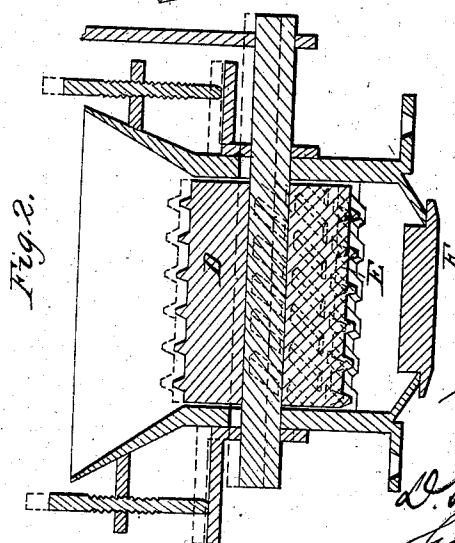
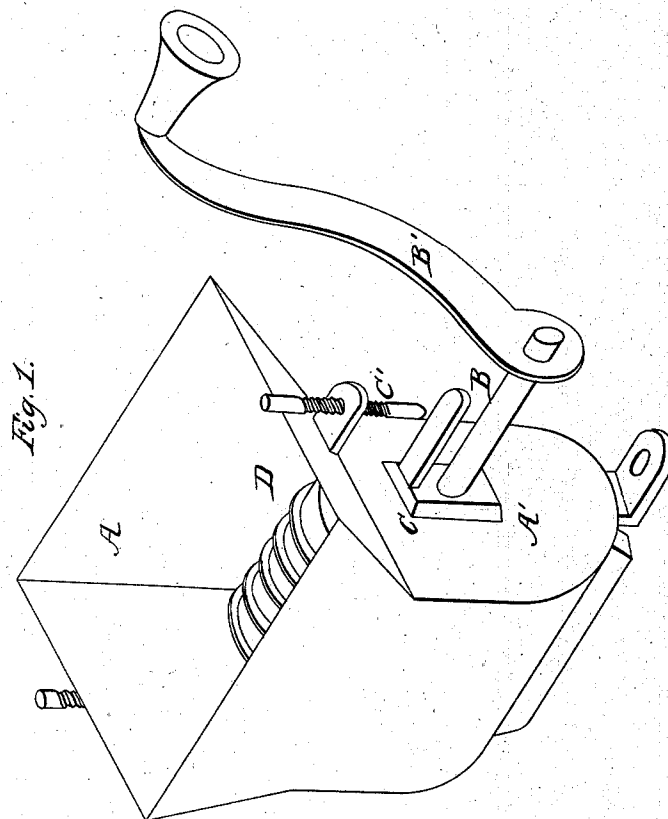


*G. L. Witsell*  
*Grinding Mill.*

*Nº 60,105.*

*Patented Nov. 27, 1866.*



*Witnesses.*  
*E. Blausen*  
*Laurence Murphy*

*Inventor.*  
*Geo L Witsell*  
*by*  
*D. F. Holloway & Co.*  
*his Atty.*

# United States Patent Office.

## IMPROVEMENT IN GRINDING-MILLS.

GEORGE L. WITSIL, OF PHILADELPHIA, PENNSYLVANIA.

*Letters Patent No. 60,105, dated November 27, 1866.*

### SPECIFICATION.

#### TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE L. WITSIL, of Philadelphia, in the county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Machines for Crushing Substances; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a perspective view.

Figure 2 is a vertical longitudinal section.

The same letters are employed in both figures in indicating identical parts.

A is the hopper for receiving the substance to be ground. The part A' is an internally concave chamber through which passes the shaft, B, turned by the winch, B'; this shaft passes through the boxes, C, which are set in dovetailed cleats retaining the boxes, but permitting their free play vertically. C' is a set-screw passing through a lug on the hopper, and resting against a projecting arm attached to the box, C. D is a roller hung upon the shaft, B, and having the spiral thread of a left-hand screw raised upon its surface. The concave face of the chamber, A', is in like manner cut into alternately raised ribs and depressions, arranged spirally, in like manner as with the ribs on the roller. These ribs are shown at E, and by the dotted lines in fig. 2. This construction of the grinding-roller is to be distinguished from that in which a series of spirally inclined grooves or ribs are formed on a cylinder to present oppositely inclined edges to other ribs or grooves on the concave, in this essential feature, that I construct my cylinder with a single helical rib running several times around the cylinder like the thread of a screw, and bringing to bear the power of a screw in crushing substances between the rib and the irregular surfaces of the concave. Substances intended to be ground, (such as paints, clay, quartz, drugs, coffee, &c.,) being thrown into the hopper, and falling between the roller and the sides of the hopper, will be drawn by the screw on the roller towards the end of the box, and being pressed against and and at the same time drawn across the concave face of the chamber, A', they will be crushed and ground between the ribs upon the roller and those upon the concave. The substances when ground will be discharged through an opening in the bottom of the chamber, A', which may be closed by the plug F.

The casing is made tight, except at the orifice of discharge, which may be closed by the plug F, as described. This plug is to be used whenever the machine is used for mixing fluids; the materials placed in the mill being thoroughly incorporated by the action of the roller before the plug is withdrawn which retains them.

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

The roller D, when constructed with a single helical rib like the thread of a screw, and suspended upon the vertically adjusted shaft, B, when used in combination with the hopper A, and spirally ribbed concave A', said parts being respectively constructed and the whole arranged to operate substantially in the manner and for the purposes set forth.

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

GEO. L. WITSIL.

Witnesses:

C. F. CLAUSEN,

LAWRENCE MURPHY.