J. W. SMITH.

Crushing Mills.

No. 137,035. Patented March 18, 1873.

Fig. 1.

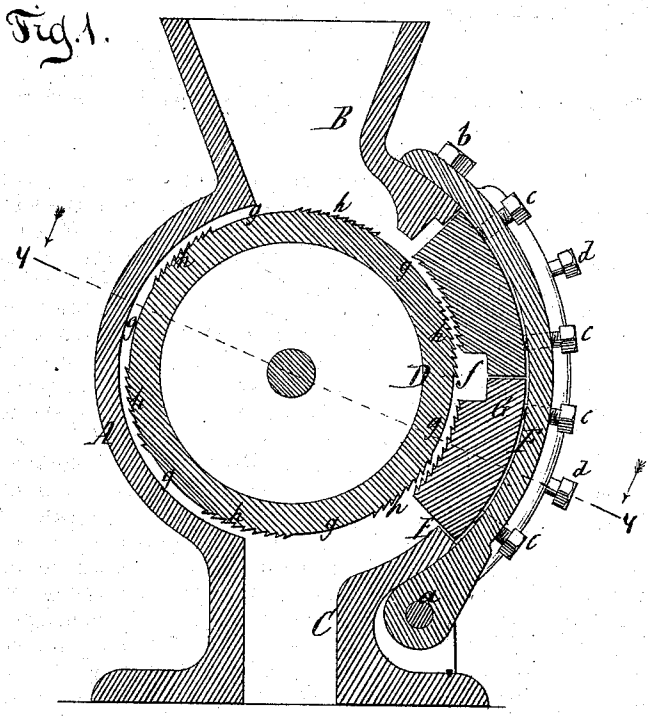
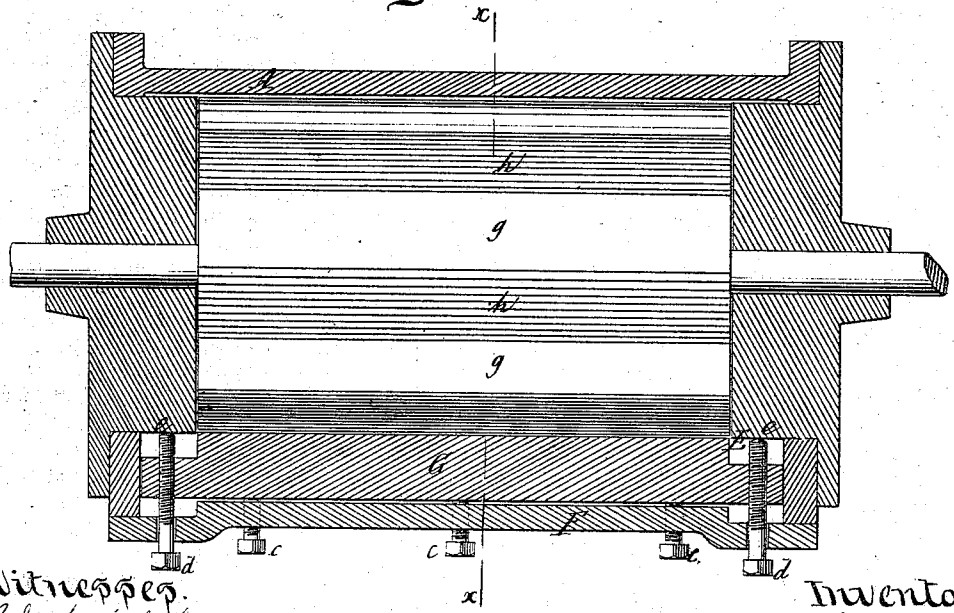



Fig. 2.




Witnesses.

E. G. Kristenhuber.

Chas. Wahlers.

Inventor.

James W. Smith

per

Van Santvoord & Hauff,

AM. PHOTO-LITHOGRAPHIC CO. N.Y. (OSBORNE'S PROCESS.)

# UNITED STATES PATENT OFFICE.

JAMES W. SMITH, OF COLUMBUS, GEORGIA.

## IMPROVEMENT IN CRUSHING-MILLS.

Specification forming part of Letters Patent No. **137,035**, dated March 18, 1873.

*To all whom it may concern:*

Be it known that I, JAMES W. SMITH, of Columbus, in the county of Muscogee, in the State of Georgia, have invented a new and Improved Crushing-Mill; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a transverse vertical section of this invention in the plane *x x*, Fig. 2. Fig. 2 is a longitudinal section of the same in the plane *y y*, Fig. 1.

Similar letters indicate corresponding parts.

This invention consists in combining with a crushing-cylinder, having longitudinal plain interspaces alternating with the tooth portion, an adjustable concave made in two or more sections, having a groove or recess between them, the whole constructed and arranged in such a manner that as the concave wears it can be readjusted, and the material introduced between the crushing-surfaces is reduced to a uniform fineness, and by means of the groove or recess the crushing-surfaces are relieved and the machine prevented from clogging, while by the presence of the plain interspaces between and alternating with the teeth the crushing-surface is relieved at intervals; also, in the arrangement of a door, which is hinged to the case inclosing the crushing mechanism, and which carries the concave in such a manner that by turning down said door easy access can be had to the concave for the purpose of repairing or changing the same as may be required.

In the drawing, the letter A designates a case made of cast-iron or any other suitable material, and provided with a hopper, B, on top and with a discharge-opening, C, at its bottom. Said case is made cylindrical, and it incloses the crushing-cylinder D, the gudgeons of which have their bearings in the heads of the case, and one of which extends through said head to make room for a pulley or cog-wheel that serves to transmit motion to the crushing-cylinder. In one side of the case A is an opening, E, which can be closed by a door, F, that is secured to the case by a hinge joint or pivot, *a*, Fig. 1, while its loose or upper end can be fastened by two or more screws, *b*, which are tapped into the shell A. On the inner surface of the door F is placed the concave G, which is adjusted in the proper position by two sets of screws, *c d*. The screws *c c* are tapped into the door F, and they bear with their ends on the concave; but the screws *d* pass loosely through holes in the door, and they are tapped into the concave, while their tips or ends bear against shoulders *e* formed on the heads of the case A. By means of the screws *d* therefore the concave can be forced away from the crushing-cylinder D, while the screws *c* serve to force said concave up toward such cylinder, and by the combined action of the screws *c* and *d* the concave can be adjusted and firmly retained in the desired relation toward the crushing-surface of the cylinder. Said concave is made in two or more sections, (see Fig. 1,) which are entirely independent from each other, each section being provided with its separate set of screws *c d*, so that if the concave should wear off its crushing-surface can be readjusted in the proper relation toward the crushing-cylinder. If the concave is made in one piece and its ends wear off it has to be taken off and worked over to fit the cylinder, and such concave cannot be used for cylinders of different diameters. My sectional concave is readily adjusted and it can be used with cylinders of different size. In the middle of my concave is a recess, *f*, that extends throughout its entire length, and serves to relieve the crushing-surfaces and to prevent the machine from becoming clogged. The crushing-surface of the cylinder D is provided with plain interspaces *g*, which alternate with the toothed portions *h*, and which extend throughout the entire length of said cylinder. By means of these plain interspaces the material to be crushed is prevented from heating, its access between the crushing-surfaces is facilitated, and my machine can be run at considerable speed with a comparatively small amount of power.

By opening the door F easy access can be had to the concave for repairing or changing the same.

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

1. The crushing-cylinder D, provided with

the plain spaces *g* and teeth *h*, as herein shown, in combination with two or more adjustable section concaves, G, having the recess *f* between them, as described, the whole constructed and arranged substantially as set forth.

2. The door F on the case A, in combination with a concave and with a crushing-cylinder, constructed and operating substantially in the manner and for the purpose herein set forth.

JAMES W. SMITH.

Witnesses:
W. B. ORR,
JEFF. JOHNSON.