(No Model.)

F. WILSON.

GRINDING MILL.

No. 281,814. Patented July 24, 1883.

Fig. 1.

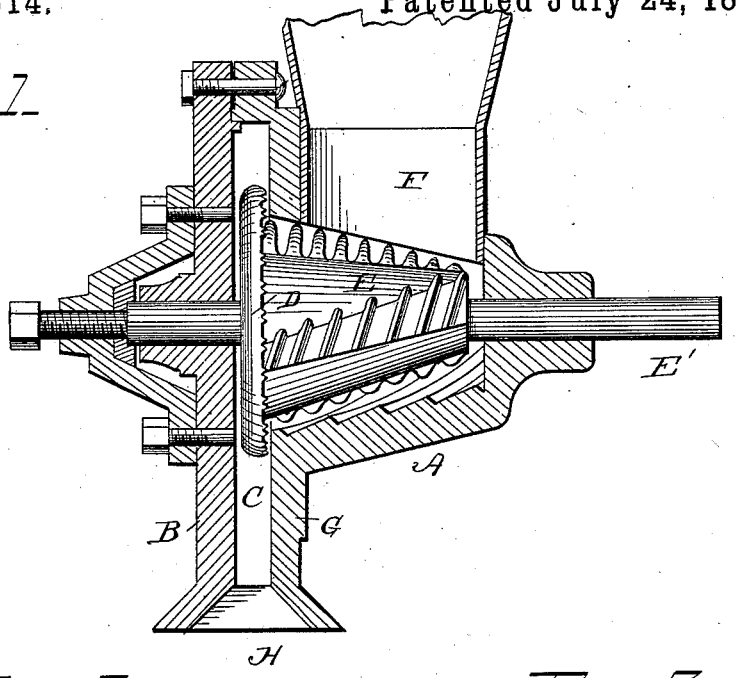


Fig. 2.

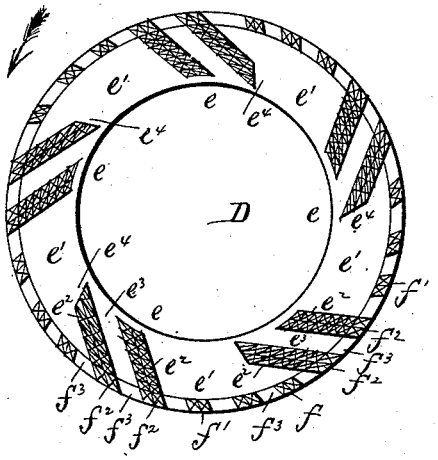
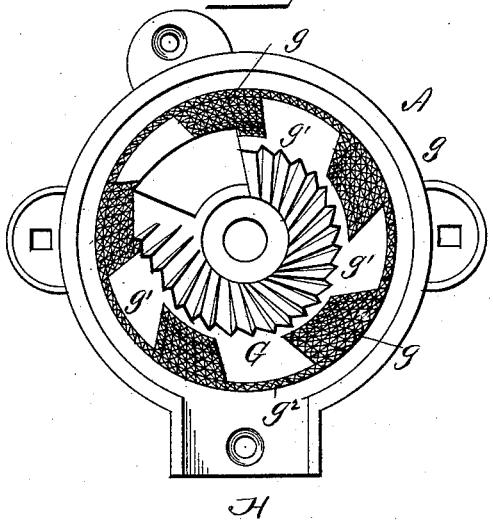


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANK WILSON, OF EASTON, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO JAMES E. WILSON AND JOHN L. WILSON, OF SAME PLACE.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 281,814, dated July 24, 1883.

Application filed May 21, 1883. (No model.)

To all whom it may concern:

Be it know that I, FRANK WILSON, a citizen of the United States, residing at Easton, in the county of Northampton and State of Pennsylvania, have invented a new and useful Grinding-Mill, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to grinding-mills; and it has for its object to provide a new construction of the teeth, whereby the grinding is done effectively and at the same time the ground portion will be allowed a ready means of escape, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a longitudinal vertical section of a mill embodying my improved construction. Fig. 2 is a plan view of the disk detached. Fig. 3 is a bottom view of the conical shell.

The same letters refer to corresponding parts in all the figures.

Referring to the drawings, A designates the conical shell; B, the cap-plate secured to the shell, and leaving a space or chamber, C, for the disk D, which is secured to or formed with the conical grinding-cylinder E. One end of the shaft E′ of the grinding-cylinder and disk is journaled in the outer end of conical shell A, while the remaining end of said shaft is journaled in the cap-plate.

A suitable hopper, F, is attached to the conical shell on one side, and at the lower end of chamber C is arranged a spout, H, adapted to carry off the material as it is ground.

The construction and operation of the foregoing parts are identical with the construction shown in my Patent No. 246,356, dated August 30, 1881, and to said patent reference is hereby made for fuller illustration and description.

The inner surface of the conical shell A, adjacent to the disk D, is formed with sets or rows of teeth g, (see Fig. 3,) and between each set are left spaces g', as shown. A circular series of teeth forming a ridge, g^2, is arranged in the rear of said sets, so that a continuous line of teeth is formed around the same.

The disk D (see Fig. 2) is provided on its outer surface with teeth, which act in conjunction with the teeth on the conical shell to grind the material fed through the hopper. As shown, the teeth on the said disk are arranged in sets e, each set being formed of two or more obliquely-inclined parallel rows, e^2, a space, e^3, being left between each row. Between the sets e is a space, e', of greater width than the aforesaid space e^3, and the rear row, e^2, of each set of teeth is beveled inwardly at its inner end, as shown at e^4. The object of this beveled construction is obvious. While the grinding-cylinder is being revolved the peculiar shape of said cylinder forces the partly-ground material outward toward the junction of the disk and cylinder. When the material arrives at this point the beveled construction permits it to pass freely outward into the space between the sets e. Without this bevel e^4 the rear row would tend to bar the free passage of the bones or other material, and thus clogging would be the result.

On the outer edge, f, of the disk a series of teeth are formed. These teeth are arranged as shown, two or more teeth, f', being formed in the space e', between each set of teeth e, while teeth f^2 are formed along said edge back of each set, suitable spaces, f^3, being left, as shown, to correspond with the spaces e^3 between the rows e^2. The spaces e^3 and f^3, having the inclination of the rows e^2 f^2, permit the ready escape of the ground material into chamber C, whence it passes to the discharge-spout.

The conical grinding-cylinder is formed with specially-arranged lines of teeth curving spirally around the cylinder, blank spaces being left between them, said spaces running from top to bottom. The conical shell has also arranged upon its surface, adjacent to the grinding-cylinder, serrations or grooves, which act with the teeth on the grinding-cylinder to grind the material fed through the hopper.

In operation the teeth on the disk act in conjunction with the teeth of the conical shell to thoroughly grind the bones or other substances fed to the hopper. By leaving spaces, as shown, between the sets and rows of teeth all danger of clogging is obviated, since the material, as it is ground, will tend to escape through the spout by means of the construction and arrangement of teeth described.

In grinding bones, oyster-shells, and similar hard substances, it is necessary that a severe grinding of the same may be maintained

while the material is in the mill, in order that it may be reduced to the proper degree of fineness. For this reason the disk is rotated in the direction indicated by the arrow in Fig. 2, which is the reverse of the direction in which mills for grinding grain and such light substances are revolved.

It will be apparent that when the disk is rotated in the direction indicated a severe grinding of the bones will be effected, while the arrangement and construction of the teeth and the spaces between the same will permit of a draft or feed of the ground material outward to the edges of the disk, and, notwithstanding the severe grinding, clogging will not occur.

It is obvious that by reducing the size of the teeth and other minor changes, and by reversing the direction of rotation of the disk, my mill can be adapted to grind all kinds of grains, although, by reason of its construction, it is more especially adapted to grinding substances harder than grain.

Suitable mechanism, such as shown in my drawings hereto annexed, and described in my aforesaid patent may be arranged to adjust the teeth so that the bones or other materials will be more finely ground.

My improved mill is simple and durable in its construction, efficient in operation, and obviates all danger of clogging, besides possessing other advantages too numerous to mention.

Having thus described my invention, what I claim as new is—

1. The disk provided with teeth arranged in sets, each set being formed of two or more obliquely-inclined parallel rows, a space being left between each row, the rear row of each set being beveled, as shown at e^4, for the purpose set forth.

2. The disk provided with teeth arranged in sets, and a space between each set, said sets being composed of two or more rows, a space being left between each row, the rear row of each set being beveled inwardly at e^4, and the edge f of said disk having a series of teeth, f' f^2, arranged as specified, for the purposes set forth.

3. In a grinding-mill, the combination of the shell A, provided with teeth arranged in sets, alternating spaces g', and a circular ridge of teeth, g^2, forming a continuous line at its outer edge, with the disk D, provided with teeth arranged in sets, and having a space between each set, the edge of said disk also having a series of teeth, f' f^2, arranged as shown and set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

FRANK WILSON.

Witnesses:
A. L. KUTZ,
RINCERO RELLIERT.