

A. MECHWART.

MILL FOR GRINDING GRAIN, &c.

No. 251,124.

Patented Dec. 20, 1881.

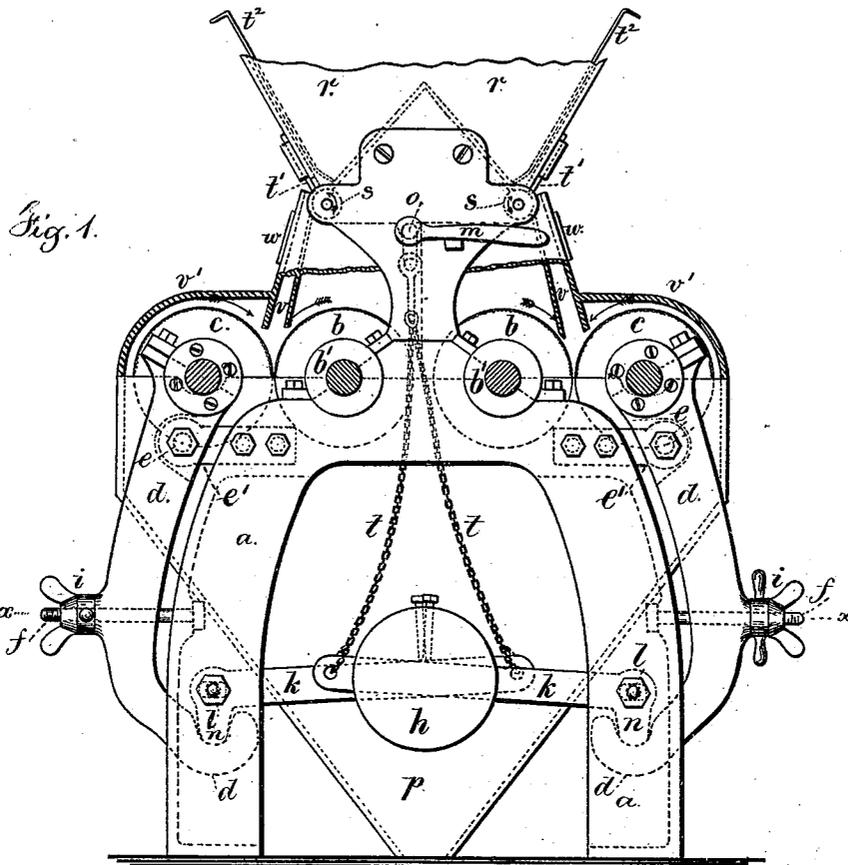


Fig. 1.

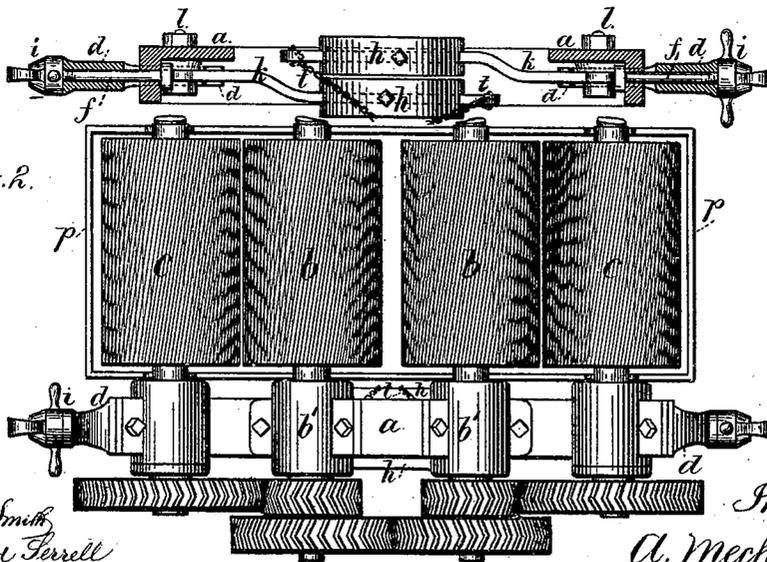


Fig. 2.

Witnesses  
 Chas. Smith  
 Harold Ferrell

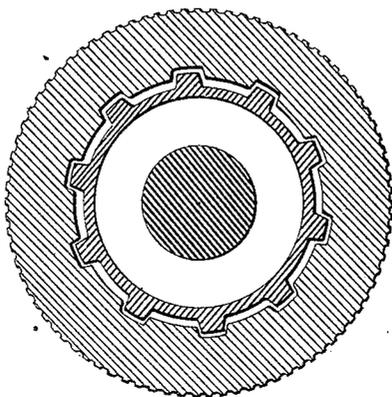
Inventor  
 A. Mechwart.  
 per L. W. Ferrell atty

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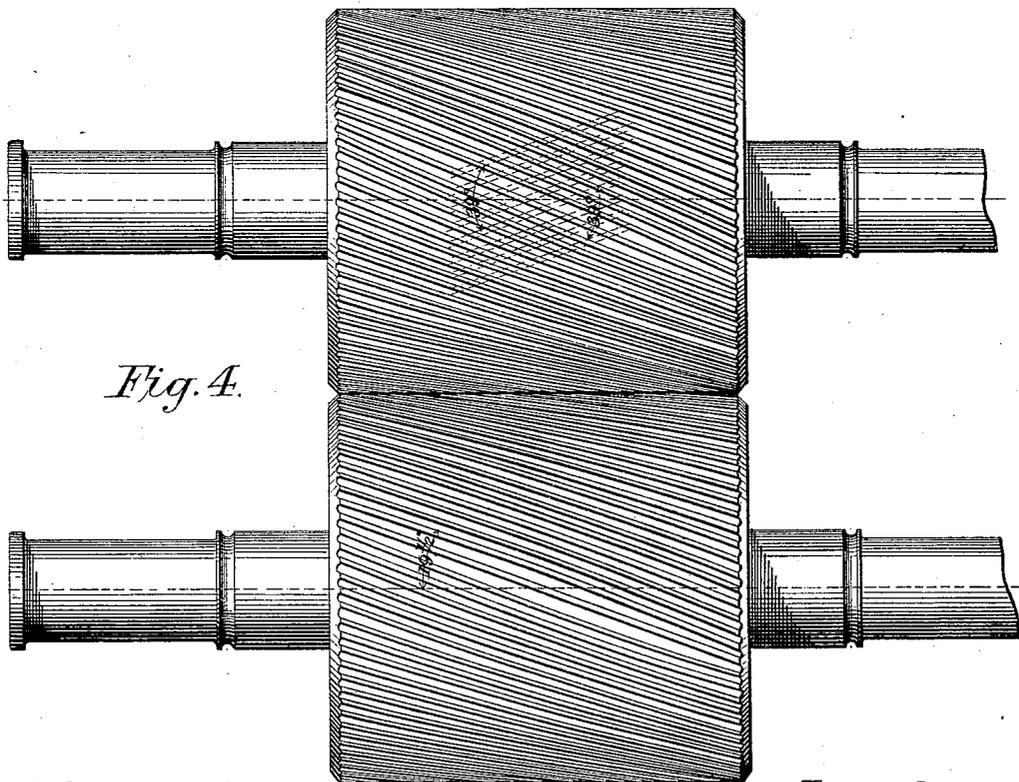
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*Fig. 3.*



*Fig. 4.*



Witnesses:  
*Geo. J. Pinckney*  
*J. Hail*

Inventor:  
*Andreas Mechwart*  
per *Lemuel W. Seeroll*  
*Atty.*

# UNITED STATES PATENT OFFICE.

ANDREAS MECHWART, OF BUDA-PESTH, HUNGARY.

## MILL FOR GRINDING GRAIN, &c.

SPECIFICATION forming part of Letters Patent No. 251,124, dated December 20, 1881.

Application filed April 22, 1880. (No model.) Patented in Austria-Hungary March 9, 1876, in Belgium December 31, 1878, in France March 7, 1879, and in Italy March 25, 1879.

To all whom it may concern:

Be it known that I, ANDREAS MECHWART, of Buda-Pesth, in the Kingdom of Hungary, have invented an Improvement in Mills for Grinding Grain into Middlings and Flour, &c., of which the following is a correct description.

This invention is set forth in Letters Patent No. 2,904, granted March 3, 1876, in Hungary, to Frederich Wegmann, and obtained in my behalf; and some of the features are in the Austrian patent, March 9, 1876, Belgian patent, December 31, 1878, Italian patent, March 25, 1879, and French patent, March 7, 1879, granted to me.

In this mill the grinding is effected between pairs of cylinders having grooved surfaces, said cylinders being revolved at different speeds and delivering the flour or meal into a hopper or receptacle below.

The peculiarity in the present invention consists in the construction and arrangement of the devices for adjusting and holding the movable cylinder in each pair of cylinders so as to regulate with accuracy the approach of one cylinder to the other, whereby absolute contact and wear of one cylinder against the other is prevented, and in case of any solid obstruction falling into the mill the rollers will yield, or the pressure can be removed instantly by the attendant. I also combine with this mill an automatic feeding device that supplies to the grinding-cylinders only the proper amount of grain.

In the drawings, Figure 1 is an elevation with the gearing removed. Fig. 2 is a plan with the frame on one side in section at the line *x x*, Fig. 1. Fig. 3 is a section of one of the rollers, and Fig. 4 is a plan of the two rollers. The dotted lines on one of the rollers indicate the direction in which the grooves cross each other at the points of contact.

The frames *a a* are of a suitable size and strength to receive the parts, as hereinafter set forth.

The cylinders *b b* have shafts that are in fixed bearings *b'* upon the frames *a*, and the cylinders *c c* have shafts that are in yielding bearings or journal-boxes upon the levers *d d*. These cylinders *c c* are preferably of chilled cast-iron. The fulera *e* of the levers *d* are com-

posed of pins passing through the levers and through wrought-iron or steel bars *e'*, that are bolted to the frame and enter central recesses or mortises in the levers *d*, so that the strain will be equalized and not tend to bind any of the parts. The levers *d* and the grinding-cylinders *c* are supported upon these fulcrum-plates *e'*.

The bolts *f* pass through the frame *a*, and also through the respective levers, and the nuts *i* serve to regulate and adjust the movement of the levers outwardly, and prevent the surfaces of the cylinders *b* and *c* coming into intimate and injurious contact. This also allows the miller to regulate with accuracy the "chop" or fineness of the flour or meal.

The weights *h* and levers *k* upon the fulera *l* act, through the toes *n*, upon the lower ends of the respective levers *d* to force them outwardly. These weights can be moved along upon the levers, so as to regulate the force with which they act in keeping the pairs of grinding-cylinders together, and in case of any obstruction getting into the mill the pressure is thrown off instantly by turning the handle *m* and revolving the shaft *o* and its cranks at each side of the machine to raise the weights *h* by the chains *t*, that connect the weights and cranks. The material as crushed or ground falls into a bin or hopper, *p*, and is removed from the same from time to time.

The grain, seeds, or other material to be ground is placed in the hopper *r*, at the bottom of which there are inclined boards to direct the material to the upper surface of two rollers, *s s*, that are revolved, and the grain passes over these rollers out at a narrow mouth that is between the surface of the roller and a movable slide *v*. By adjusting this slide the feed may be increased or lessened, and the movement of the roller prevents the grain becoming clogged. These rollers *s s* should be grooved longitudinally, and the surfaces of the grinding-cylinders are also to be grooved longitudinally, but at a slight inclination to the axis, so as to act with a shearing or rubbing cut, and this is promoted by the one cylinder in each pair moving faster than the other cylinder.

A cut-off is provided at *t'*, by lowering which the supply of grain to the cylinders *b c* is

stopped. This dispenses with altering the adjustment of the slide *t'* when it is necessary to shut off the supply of grain to the cylinders *b c*.

The gearing employed to drive the cylinders may be of any desired character. The teeth of the gears are, however, by preference, made with a double inclination, or V-shaped, upon the faces of the wheels, to prevent inequality of movement; and the driving-power may be applied separately to the respective pairs of cylinders, or to both pairs of cylinders, from one pulley or wheel.

The grain, as it is delivered by the rollers *s*, runs down an incline, *v*, directly to the grinding-cylinders. There are to be covers *v'* above the cylinders *b c*, inclosing them from dust and foreign substances, and the glass applied at *w* allows the attendant to observe the flow of the grain as it passes down the incline *v*.

Crushing-cylinders have before been made with grooves in the surfaces parallel with the axis, and also oblique or inclined; but when inclined the grooves in one cylinder were the reverse of those in the adjacent cylinder; hence these grooves as the rollers revolved coincided; and a rib of one cylinder might pass into or move opposite to a groove of the adjacent cylinder if the two moved at the same speed; hence there was not any reliable cutting action between the projecting edges. In instances where grinding has been done by rollers with saw-teeth ribs these ribs have been inclined in the same direction; but one cylinder revolved in the same direction as the other; hence the adjacent surfaces moved in opposite directions and are not adapted to grinding grain or similar material. I make my cylinders of chilled cast-iron, with the grooves in the same direction of inclination; hence the right-hand side of one roller in which the inclination of the grooves is upwardly will be adjacent to the left-hand side of the next roller in which the inclination of the grooves is downwardly, and said grooves will therefore cross each other, and one roller moving faster than the other, the difference of speed being at least

one to two, for otherwise the cutting of the grain is not perfect, produces a constant cutting action, similar to a number of shears, and the edges on one cylinder cannot pass into the grooves of the adjoining cylinder, because they always cross each other at an inclination. As a result of this construction the grinding is of the most perfect and uniform character, and the working capacity of the machine is greatly increased.

It is to be understood that the pairs of rollers being geared together by gears of different sizes insures the proper relative speeds, and the adjacent surfaces of the rollers are moving in the same directions.

In this application I do not make any claim to the hopper and roller feed with an adjustable gate and an independent closing-gate, as the same is shown in my English Patent No. 563 of 1878, and claimed in a prior application made by me for a patent in the United States.

I claim as my invention—

1. In combination with the pairs of grinding-cylinders, the levers *d*, fulcrum plates *e'*, passing into mortises in the levers, the adjusting-bolts *f*, passing from the frame through the levers, the weighted levers *k k*, and lifting device, substantially as set forth.

2. In a mill for grinding grain or other material, a pair of chilled cast-iron cylinders, the surfaces of which are obliquely grooved in the same direction, in combination with mechanism for revolving both rollers at different speeds, substantially as set forth.

3. In a mill for grinding, the combination, with the rollers and the levers carrying one roller, of screw-bolts secured to the frame of the mill, and a nut applied to each screw and bearing against the lever, substantially as and for the purposes set forth.

Signed by me this 24th day of March, A. D. 1880.

ANDREAS MECHWART.

Witnesses:

SZULÁNYI LÓPTI,  
REIKE BERNHARD.