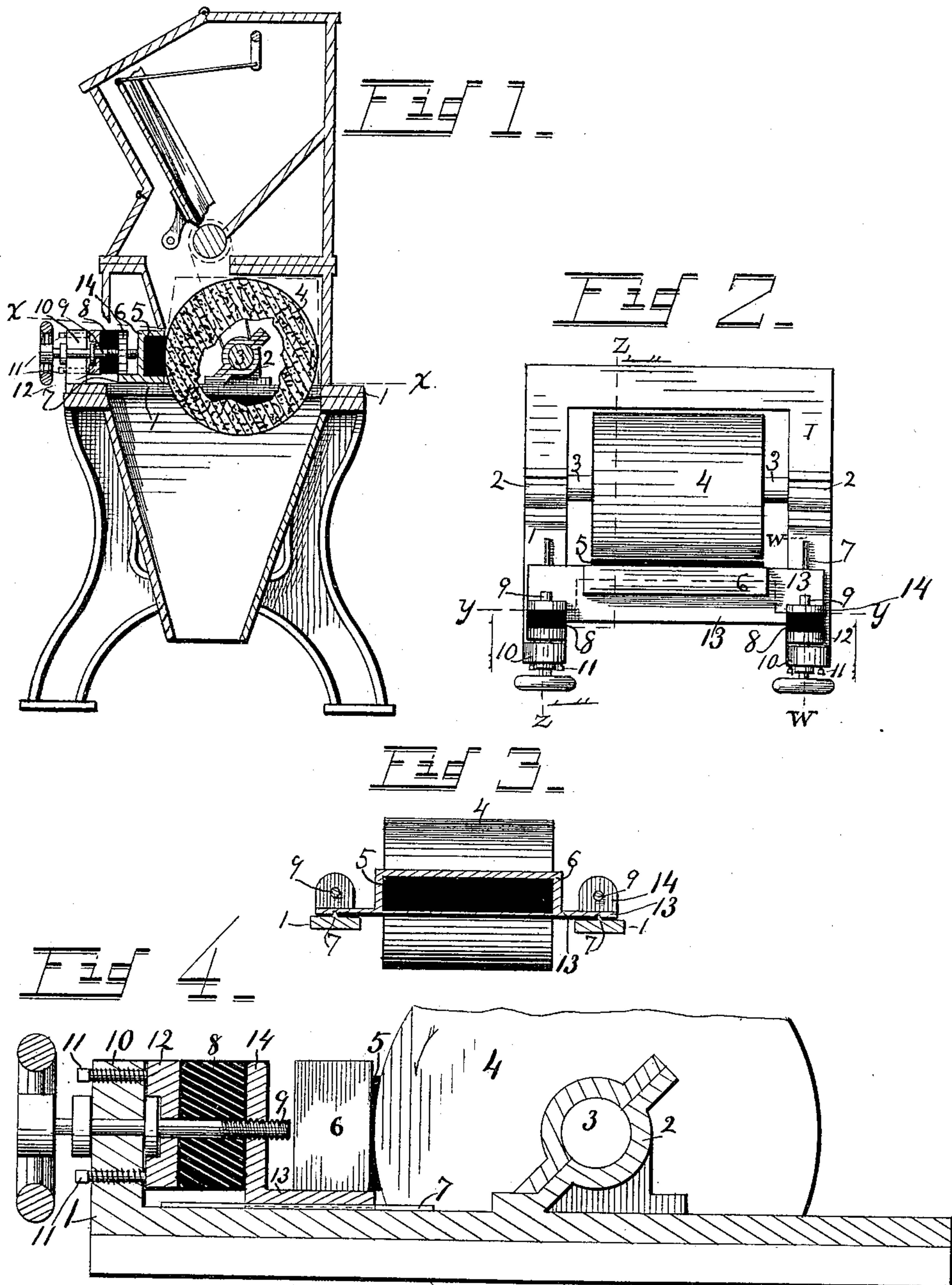


(No Model.)

W. T. PYNE.
GRINDING MILL.

No. 365,022.

Patented June 14, 1887.



Witnesses..

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UNITED STATES PATENT OFFICE.

WILLIAM T. PYNE, OF LOUISVILLE, KENTUCKY.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 365,022, dated June 14, 1887.

Application filed September 1, 1886. Serial No. 212,391. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. PYNE, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Grinding-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of grinding-mills called "cylinder and concave," the rotary stone being cylindrical and the opposing stationary stone a corresponding concave.

The object of the invention is, first, to adapt such stones to grind evenly at all times and with as little wear to the machine and with as little expenditure of power as possible; second, to adapt the concave stone to be adjusted with great nicety relatively to the revolving stone, while offering a yielding resistance in grinding any material.

To this end the invention consists in the construction and combination of parts forming a grinding-mill, hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a transverse vertical section on the line *z*, Fig. 2, of a mill, showing my invention. Fig. 2 is a horizontal section of the same, looking down upon the line *x*, Fig. 1; and Fig. 3 is a longitudinal vertical section thereof at the line *y y*, Fig. 2. Fig. 4 is a transverse vertical section at *w w* of Fig. 2, on a larger scale.

1 represents the frame of the machine, usually made of iron.

2 2 are pillow-blocks firmly bolted to the frame 1, and serving as bearings for the shaft 3 of the cylinder or grinding-roller 4. This cylinder is made of granite or other suitable material for a grinding-stone, and it is to be revolved in the direction of the arrows (shown in Fig. 4) in the usual manner in service.

5 represents the concave grinding-block. This block is usually made of the same material as the cylinder-stone opposed to it, and is vertically about one-third the thickness thereof. It is concave along the side next to the cylinder to fit against the convex surface thereof, and it is held in position by a box, 6, which is cast in one piece with the bottom

plate, 13, which plate extends beyond the ends of the stone and is grooved to fit upon ribs or slideways 7 on the frame 1. Thus the box 6 may slide toward or away from the cylinder carrying the concave stone 5, with its center in a horizontal plane radial to the cylinder.

8 represents one or more cushions, which I place behind the piece which carries the stone 5 to hold it up to its work. These cushions I prefer to make of india-rubber spring material.

9 represents a pair of hand-screws loosely journaled in ears 10 of the frame 1 and threaded into ears 14, which are cast solid upon the plate 13, thereby connecting the screws 9 with the box 6 to retract it from the cylinder against the resistance of the cushions 8. These screws do not push the stone 5 forward to its work. On the contrary, they stop the stone rigidly from advancing beyond their limit, no matter how strongly the cushions 8 may press, thus serving as adjusting-screws to the stone, whereby it may be set to grind the material into coarse or fine meal.

While it is possible that one or more cushions might be fitted into a mill so accurately that they would always press the stone 5 forward with the required force to do good grinding, yet I have thought it to be a surer way of securing unvarying evenness in the work produced to provide means for adjusting the pressure of the cushions. The simplest way that now occurs to me to do this is to thread adjusting screws 11 into the ears 10, or some other suitable portion of the frame 1, to bear against the cushions 8, or against intermediate washers, 12, to compress the cushions to the degree of tension required for service. By this means suitable adjustment might be made to correct the evil of one end of the cylinder wearing away faster than the other, and by the same means more or less elasticity may be given to the cushion, as required for grinding different kinds of material. In general use, after the screws 11 are once properly adjusted they may not require alteration in a year or more, dependent on the evenness in quality of the two cushions, &c. It is not intended that the cushions 8 shall be so elastic as to permit a perceptible vibration of the stone 5 to and from the cylinder in service. On the contrary, they should present the characteristics

of cushions or slightly-yielding bodies. The ways 7 lie in a horizontal plane parallel with the horizontal radial plane of the cylinder and enough below the said radial plane to carry the center of the stone 5 radially to or from the cylinder. The ears 10 of the frame 1 project vertically across the line of the ways 7, and the ears 14 project vertically from the plate 13 of the stone-carrying box 6 above the ways 7 and directly opposite to the ears 10, in order that the stone 5 may be held practically in a solid corner of the frame. The cylinder 4, revolving in the direction of the arrow, tends to press the stone 5, with its box, down upon the ways 7, while the wedging action of the material which is being ground between the stones tends to press the stone 5 directly backward. This pressure is resisted by the fixed ears 10, acted upon through the medium of the ears 14, the cushions 8, and the washers 12. One of the forces producing the said pressure acts in a direction nearly vertical, the other horizontal, and the resultant is a diagonal between the two pressing the stone into or toward the solid corner of the frame formed at the base of the ears 10. The ears 14, cushions 8, washers 12, and ears 10 are so rigidly bound together by the screws 9 that the stone 5 would be a rigid fixture were it not for the yielding character of the cushions 8. By this means the chattering common to rigidly-set stones is avoided, better work is produced, and there is less wear upon the machinery, and consequently less power wasted.

The screws 11 and collars 12 may be dispensed with and the cushions 8 allowed to rest

directly against the ears 10. The said screws 11 and collars 12 are common means for such adjustment.

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

1. The combination of the frame 1, provided with the bearings 2, the slideways 7, and the ears 10, standing across the line of the said ways, the cylinder 4, journaled in the said bearings, the box 6, provided with the bottom plate, 13, fitted to slide on the said ways and having the ears 14 standing opposite to the ears 10, the concave stone 5, carried in the box 6 radially to the said cylinder, the cushions 8, interposed between the ears 14 and 10, and the screws 9, binding the said ears and cushions together, substantially as shown and described.

2. The combination of the mill-frame 1, provided with horizontal slideways 7, and with vertical ears 10, standing across the lines of the said ways, the stone-carrying box 6, fitted to slide upon the said ways and provided with vertical ears 14, the cushions 8, placed between the ears 10 of the frame and the ears 14 of the box, and the screws 9, passing through the ears 10, the cushions 8, and the ears 14, and binding the box, the cushions, and the frame together, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM T. PYNE.

Witnesses:

NEWTON G. ROGERS,
GEO. B. DEL VECCHIO.