J. MILLS.

Middlings-Grinding Mill.

No. 215,236. Patented May 13, 1879.

Fig. 1.

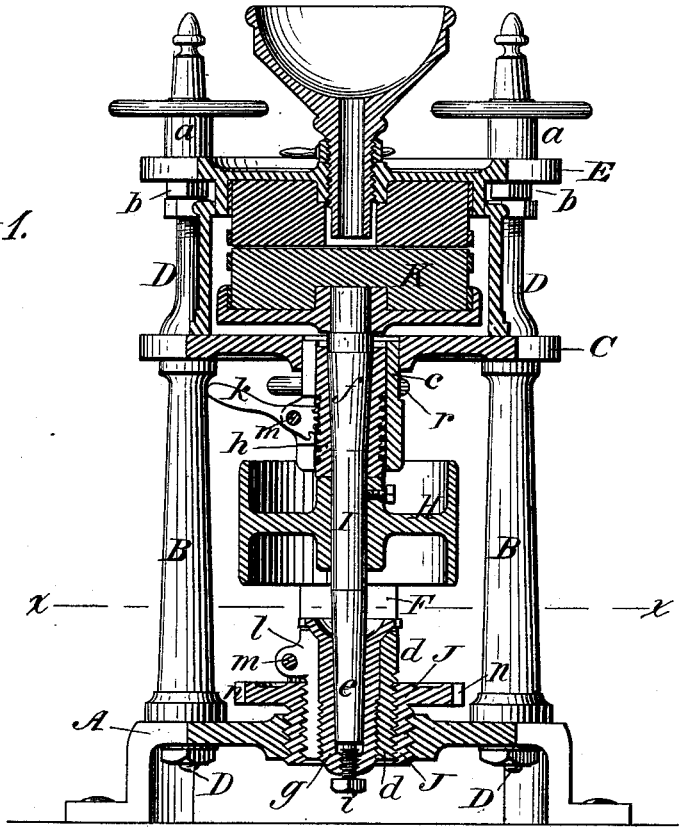
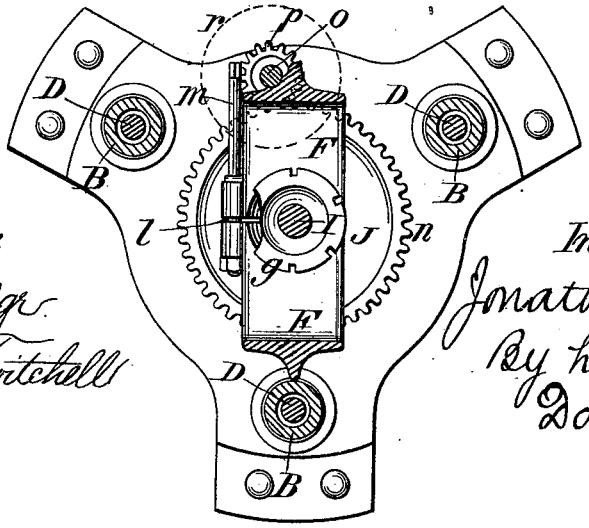


Fig. 2.



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UNITED STATES PATENT OFFICE.

JONATHAN MILLS, OF MILWAUKEE, WISCONSIN.

IMPROVEMENT IN MIDDLINGS-GRINDING MILLS.

Specification forming part of Letters Patent No. **215,236**, dated May 13, 1879; application filed January 8, 1879.

To all whom it may concern:

Be it known that I, JONATHAN MILLS, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Grinding-Mills; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of mills in which the runner-stone is rigidly secured to a vertical driving-spindle, and particularly those mills represented in an application recently filed in my own name in which the spindle has both ends mounted in an adjustable yoke.

The present invention consists in making the bearings adjustable in the yoke, in the special construction and arrangement of the yoke and bearings and the adjusting devices, and in details of minor importance, all as hereinafter described.

Figure 1 represents a vertical central cross-section through my mill; Fig. 2, a horizontal cross-section of the same on the line *x x*.

A represents a base-plate, sustaining three pillars, B, which in turn sustain the horizontal plate C. The plates and pillars are united by means of bolts or rods D, which are continued upward above the plate C to receive a third horizontal plate, E, and nuts *a b*, for supporting and adjusting the same. F represents the yoke or frame, in which the two ends of the spindle are mounted, this yoke being made with an enlarged open center to admit the driving-pulley H, and with two contracted central ends or journals, *c d*, which serve to maintain the yoke in position, and also to receive and sustain the two ends of the spindle I.

As in my original mill, the yoke has its upper end mounted in the plate C, and its lower end threaded and seated in a nut, J, which is in turn threaded on its exterior and screwed into the base-plate, the two threads being of different pitches, so that the rotation of the nut will raise or lower the yoke.

The spindle is made with two tapered or conical necks, *e* and *f*, to form the wearing-surfaces, both necks being tapered downward, as shown. These tapered necks, instead of being seated directly in the yoke, are mounted in two adjustable bearings, *g* and *h*, which are secured in the respective ends of the yoke. The lower bearing, *g*, is closed at the bottom to form an oil-cup, and provided with a vertical screw, *i*, upon which the spindle is seated, and by which it is sustained, so that it may be lowered within the bearing to compensate for wear. The bearing *g* has the main portion of its body made cylindrical, and fitted accurately and closely within the nut, and has its lower end threaded into the bearing, as shown in Fig. 1, so that by turning the bearing it may be raised or lowered in the nut to determine the height of the spindle and stone.

The upper bearing, *h*, is provided with circumferential grooves or teeth, and the yoke provided with a segmental lever-pinion, *k*, which engages with the bearing, as shown in Fig. 1, so that by moving the lever the bearing may be raised to compensate for the wear of the conical neck, and thus keep the spindle tight and true.

As a means of clamping the two bearings *g* and *h*, the ends or necks of the yoke are split or divided on one side, as shown at *l*, and provided with transverse bolts or screws *m*, by which the yokes may be drawn tightly together upon the bearings.

The neck *c* of the frame may be, and ordinarily is, made to fit upon the box-bearing *h* with such closeness as to hold it from descending, but at the same time permit its adjustment by the pinion-lever without requiring the screw *m* to be adjusted.

The upper one of these bolts also serves as a pivot for the pinion-lever. As a means of operating the nut J, by which the yoke is raised and lowered, it is enlarged at the top and toothed on the periphery, as shown at *n;* and in the frame there is mounted an upright shaft, *o*, the lower end of which is provided with a pinion, *p*, and the upper end with a hand-wheel, *r*, as shown.

The shaft *o* will bear in a groove or pass through eyes on the side of the yoke, to prevent the same from rotating, the form of the present yoke being such that it admits of the

driving-belt being applied in nearly all directions.

The lower grinding-stone, K, is secured rigidly to the upper end of the spindle, and the upper stone secured rigidly to the under side of the plate.

The rotation of the hand-wheel turns the nut J, and causes the spindle, its bearings, and the lower stone to move vertically together, so as to change the distance between the faces of the stones. The rotation of the screw *i* raises or lowers the spindle within the bearing *g*, to maintain the proper closeness of fit therein, and the rotation of the bearing *g* within the nut J raises or lowers the bearing, to compensate for the adjustment of the screw *i*, and thereby prevent the spindle from being moved vertically in the yoke. The movement of the bearing *h* compensates for the wear of the upper end of the spindle without changing its adjustment.

In order to prevent the spindle from working upward, as it would have a tendency to do on account of the conical bearings, the driving-pulley is adjusted to bear at its top against the upper spindle-bearing, as shown.

Having thus described my invention, what I claim is—

1. In a grinding-mill, the combination of the adjustable yoke F, the spindle having the two conical necks, and the two bearings adjustably mounted within the yoke.

2. In combination with the yoke F and the spindle having the conical neck *f*, the externally grooved or toothed bearing *h* and lever *k*.

3. In combination with the vertically-movable yoke, provided with and sustained by necks at its ends, and its adjusting mechanism, the shaft O, applied as shown, and serving the double purpose of operating the adjusting devices and of preventing rotary motion of the yoke.

4. The vertically-adjustable yoke or frame F, the spindle having its ends tapered and sustained by the yoke, the bearing *g*, adjustable vertically within the yoke, and the step *i*, adjustable within the bearing, in combination with means of adjustment substantially such as shown, whereby the three independent adjustments are permitted, as described.

5. The combination of the mill-spindle having the two conical necks, the driving-pulley having a bearing at or against its upper side, the two adjustable spindle-bearings *g h*, and means, substantially such as described, for adjusting said bearings vertically.

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

JONATHAN MILLS.

Witnesses:
FRANK J. STERN,
JNO. H. STEINWAY.