(No Model.)

J. STEVENS.
Grinding Mill.

No. 236,104. Patented Dec. 28, 1880.

FIG. 1.

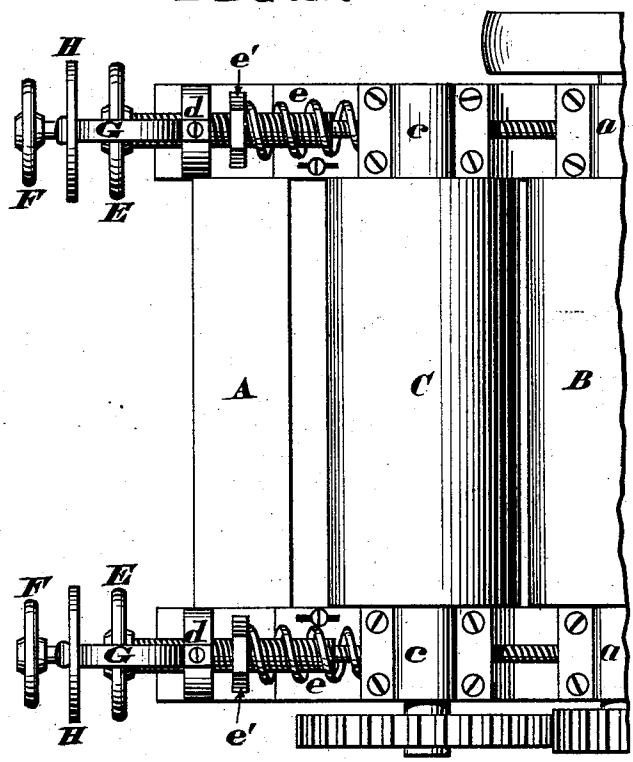

FIG. 2.

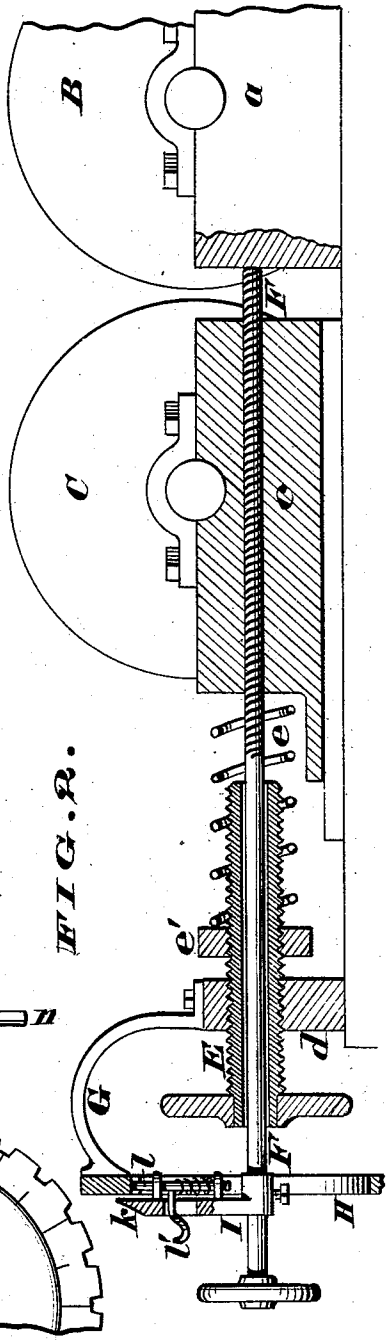

FIG. 3.

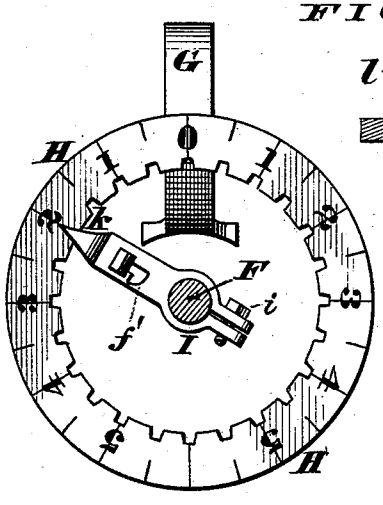

FIG. 4.

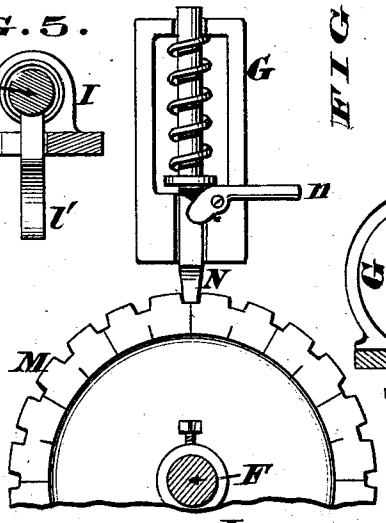

FIG. 5.

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UNITED STATES PATENT OFFICE.

JOHN STEVENS, OF NEENAH, WISCONSIN.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 236,104, dated December 28, 1880.

Application filed November 4, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHN STEVENS, of Neenah, in the county of Winnebago and State of Wisconsin, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification.

My invention relates particularly to the adjusting mechanism which determines the distance between the rolls in that type of grinding-mills known as "roller-mills," or between the cylinder and concave in concave-mills; and it consists in combining with such mechanism a register whereby the adjustment is visually indicated, and a locking device, instantly controlled by the attendant, which permanently locks against an accidental change of adjustment, substantially as hereinafter described and claimed.

Letters Patent of the United States numbered 230,834 were granted me August 3, 1880, for adjusting mechanism applied to the sliding bearings of a yielding concave or roller, whereby both the limit of approach of one grinding-surface to the other and the extent of its retreat therefrom might be determined. In order to properly explain my present invention I have chosen to illustrate it in connection with this patented device.

In the drawings, Figure 1 is a plan view of so much of a roller-mill embodying my invention as is necessary to a complete understanding of its principle and mode of operation. Fig. 2 is a side elevation, partly in section, of the machine shown in Fig. 1. Fig. 3 is a front elevation of the registering and locking device; Fig. 4, a modification thereof, and Fig. 5 a detail.

A is the frame of the machine, of any common or suitable construction. Supported upon this frame are stationary blocks *a*, which form bearings for the roller B, and other sliding blocks, *c*, in which is journaled the yielding roller C, geared, as usual in this class of machines, to revolve either toward or away from the other roller and ordinarily at differential speed thereto. These rollers may be smooth or ribbed, and porcelain or metal surfaced, as desired.

Through the frame-work at the exterior of the machine, or through lugs *d*, projecting thereform, pass the hollow adjusting-screws E, which form stops to limit the retreat of the sliding from the stationary blocks, and thereby determine the maximum of distance to which one roller or grinding-surface can yield from the other. Encircling these screws are coiled springs *e*, which bear against the sliding blocks and press the yielding roller toward the converse factor. Nuts *e'* upon the screws serve as adjustable seats to the springs, so that their stress may be changed when necessary.

Lengthwise through the hollow screws, and playing freely therein, are carried other screws, F, which thread into and through the sliding blocks, and bear against the stationary blocks, to determine the limit to which the former may approach the latter, and consequently the minimum of distance between the grinding-surfaces.

The parts thus far described are substantially the same as in my former patent, above mentioned, to which reference may be made for a further or more extended description.

Bolted fast to the frame-work or to the lug *d*, at each side of the machine, in such manner as to overhang the rear end of the screws at that side, is a bracket, G, bearing at its outer end a dial, H, concentric with the screw F, and encircling it between its head or hand wheel and the rear end of the hollow screw, through which it passes. This bracket I have shown as curved to bridge a hand-wheel on the end of said hollow screw; but as the adjustment of the latter rarely needs to be changed, I form it, in practice, with a square or polygonal head adapted to a wrench, whereby less space is taken, and the bracket may be made straight.

The dials are formed either with skeleton-rims for the graduating-marks, as in the drawings, or with raised rims set out from a solid body portion fitting upon the shank of the screw, so as to be braced against lateral movement thereby. They are each of the same size and graduated alike. The graduations I prefer to number both right and left from a zero-point at the top of the dial until they meet at the bottom, as shown; but they may be numbered consecutively in one direction only.

Upon the screw F, beneath the dial, is mounted a block, I, so secured as to turn with the

screw in its revolutions. An easy and convenient mode of attaching the block to the screw when the dial is formed as first described is by providing it with a split bearing, which may be tightened up by means of a small screw, *i*, so as to firmly clamp the spindle it incloses, and which will permit its ready removal at any time.

From the block projects a finger or pointer, *k*, which rests over the dial-face and indicates the graduations thereupon. Beneath each graduating-mark on the inner edge of the dial-rim is a notch, and upon the body of the pointer is placed a spring-bolt, *l*, which can take into any one of these notches, thereby locking the pointer in position over the corresponding graduating-mark and holding the adjusting-screw against rotation. The point of the bolt, in case its supporting-block is clamped fast to the adjusting-screw, is elongated in the direction of the length of the screw, so that it may take into the notches at any probable adjustment, or allow for the play of the screw as the roll or concave yields. A thumb-piece, *l'*, attached to the bolt, projects through a slot in the body of the pointer, to afford means for retracting it from its seat in any given notch, and at the bottom of the slot the metal is cut away to one side to form a shoulder, *f*, under which the thumb-piece may catch to hold the bolt in its retracted position while the adjustment is being changed by means of the screw.

When a solid dial-body is used or great range of adjustment is desired the pointer-block may be keyed to the adjusting-screw by means of a spline and groove, which will permit it to move longitudinally thereon, and may be kept at a fixed distance relatively to the dial by means of a yoke and collar connection therewith or with the frame-work of the machine.

With the construction described, when, by means of the screws F, the machine has been once adjusted as to the minimum of distance which it may be desired to permit between the grinding or crushing surfaces, the bolts may be released and let into the proper notch in the dials, and thereafter the screws will be securely held from working under the vibrations of the machine and insensibly changing the adjustment, while the pointers will indicate at a glance the gage at which the screws are locked.

The device may be modified by placing the dials upon the adjusting-screws and keying them thereto so as to turn therewith, when the pointers will depend from the brackets and the bolts be mounted thereupon in such manner as to take into notches in the periphery of the dials. Such a construction is indicated in Fig. 4, F being the screw; G, the bracket; M, the dial; N, a combined bolt and pointer, and *n* a cam or other lever, whereby the bolt may be raised and locked out of engagement with the notched rim during any change of adjustment.

It is not essential to my invention that it should assume the precise forms, or be used with the particular adjusting devices herein described, or applied alone to that which determines the minimum of distance between the grinding-surfaces. The construction and application shown and described are, however, those which I consider the best.

I claim—

1. The combination of the adjusting-screws, the graduated dials, the pointers keyed or otherwise secured to said screws to turn therewith, and the bolts upon said pointers, taking into notches in the dials to lock the screws in the adjustment indicated.

2. The combination of the screws whereby the maximum of retreat of one grinding or crushing surface from the other is determined, the screws concentric therewith, whereby the minimum limit of approach of said surfaces is determined, the springs coiled about said screws and pressing the grinding agents toward each other, the graduated and notched dials supported by a bracket between the heads of said screws and concentric with their spindles, and the pointers and bolts secured to the second-named screws to turn therewith, indicate their adjustment upon the dial, and lock them against accidental change.

JOHN STEVENS.

Witnesses:
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ALEX. MCNAUGHTON.