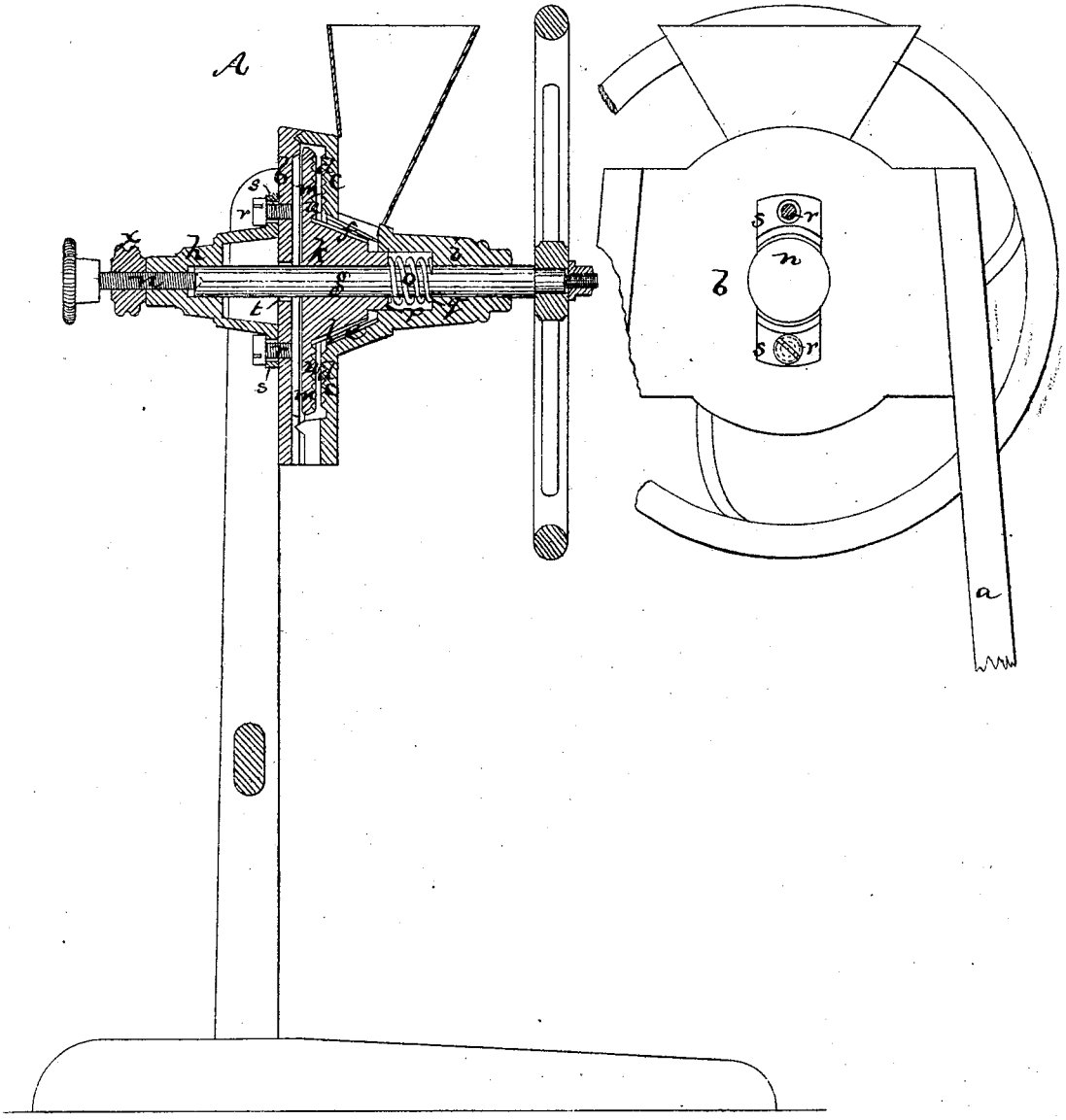
Joel Garfield,

Imp'd Mill for Grinding Coffee, Spices, &c.

117879 PATENTED AUG 8 1871



Witnesses
S. B. Kidder.
M. W. Frothingham.

Joel Garfield
by his Attys
Crosby & Gould

UNITED STATES PATENT OFFICE.

JOEL GARFIELD, OF AYER, MASSACHUSETTS.

IMPROVEMENT IN MILLS FOR GRINDING COFFEE, SPICES, &c.

Specification forming part of Letters Patent No. 117,879, dated August 8, 1871.

To all whom it may concern:

Be it known that I, JOEL GARFIELD, of Ayer, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Mills for Grinding Coffee, Spices, &c.; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention, sufficient to enable those skilled in the art to practice it.

My invention relates to details of construction of that class of portable or hand-mills used for grinding coffee, spices, and similar fine or comminuted material. In such mills there is used, in connection with a hopper and a rotary grinding-cone or cylinder fitting into the toothed or serrated case of the mill, a rotary grinder-plate or flange forming an integral part of the grinder-cylinder, the inner surface of such flange being toothed or serrated and operating in connection with the corresponding toothed inner face of one of the plates of the mill, the material being ground between the teeth of the rotary cone or cylinder and the conversly-shaped surface of the mill-chamber and between the teeth of the rotary flange or wheel and the adjacent teeth of the mill-plate. As these mills are generally constructed the grinding-cylinder or cone and the grinding-wheel or flange have provision for relative adjustment, so that the distance apart of the grinding-surfaces may be regulated in accordance with the nature of the material and the fineness to which it is to be reduced. Although the movable plate may be thus adjusted with reference to the stationary plate, there is nothing to prevent the plates coming together or into contact, the adjustment of the movable plate simply limiting its extent of movement from the stationary plate, and, in consequence of this, the plates come together more or less when there is not sufficient material in the mill to keep them apart, and the contact and abrasion of the respective teeth of the two plates dull and injure them.

One of my improvements has reference to a means of correcting this difficulty, and I accomplish the desired result by placing between the inner end of the rotary grinding-cylinder or cone and the bearing of the shaft a suitable spring, the stress of which presses the grinding-cylinder and cone outward or away from the stationary grinding-surfaces, and thus insures their non-contact. It is in this provision that one feature of my invention consists. Another feature of the invention relates to a provision for adjusting one of the bearings of the shaft, so that, when the machine is set up any deflection or want of parallelism of the vertical grinding-plates, or want of concentricity in the frusto-conical grinding-surfaces, may be corrected, thus insuring uniform action over the whole extent of grinding-surfaces.

The drawing represents a vertical central section of the mill and a rear view of it.

a denotes the stand, to the top of the posts of which is attached the stationary journal-plate *b*, this plate *b* having secured to its front side, by suitable screw-fastenings, the stationary grinding-plate *c*. The inner face of this plate *c* is made with teeth or serrations *d*, and at the center is a hollow frusto-conical chamber, *e*, the inner surface of which is toothed or serrated, as seen at *f*. *g* denotes the rotary shaft, journaled at one end in a removable bearing, *h*, attached to the plate *b*, and at the other end in a bearing, *i*, projecting from the front of the cone *e*, as seen at A. Fixed upon this wheel is the movable grinding-wheel, composed of a frusto-cone, *k*, (extending into the cone-chamber *e*, and having peripheral teeth *l* that act with the teeth *f*,) and a vertical flange, *m*, at the back of the cone, this flange standing parallel to the plate *c*, and having teeth *u* on its inner face, which teeth act with the teeth *d* of the stationary plate. The end of the journal-box *h* has an adjusting-screw, *n*, passing through it, the inner end of this screw working against the end of the shaft *g*. By turning up the screw the shaft may be forced inward so as to carry the grinding-wheel up toward the stationary grinding-surfaces, and by turning the screw back the wheel can fall back from such surfaces, thereby regulating the mill to grind finer or coarser, as may be desirable. The screw is held from accidental movement by a check-nut, *x*. To force the grinding-surfaces apart and keep them apart, whether material to be ground be between them or not, I place a spring, *o*, between the end *p* of the grinding-cone and the end *q* of the bearing *i*, the stress of the spring keeping the plates apart to the extent permitted by the position of the adjusting-screw *n*, so that the teeth of the respective surfaces cannot collide. The bearing *h* is fastened to the plate *b* by screws *r* passing through ears *s*. The holes through

these ears are larger than the screw-shanks, the screws working in nut-threads formed in the plate, and the shaft-hole *t* of the plate *b* is made larger than the shaft, and when the mill is set up the bearing *h* is attached to the plate *b*, the end of the shaft being introduced into it. The bearing is then moved up or down or laterally until the the shaft is exactly centered, and then the bearing-screws are tightened, and the mill is ready to work and to grind uniformly over all its grinding-surfaces.

I claim—

1. In combination with the rotary and stationary grinding-surfaces, the spring *o* located between the end of the grinding-cone and the end *q* of the bearing *i*, and also operating to keep the grinding-surfaces apart, all as shown and described.

2. In combination with the shaft and the rotary and stationary grinding-surfaces or plates, the adjustable bearing *h* having holes therein larger than their screws *r*, and having its hole through which the shaft passes also made larger than the shaft, as and for the purpose described.

JOEL GARFIELD.

Witnesses:

A. FENNER,

E. W. BELCHER.