

(No Model.)

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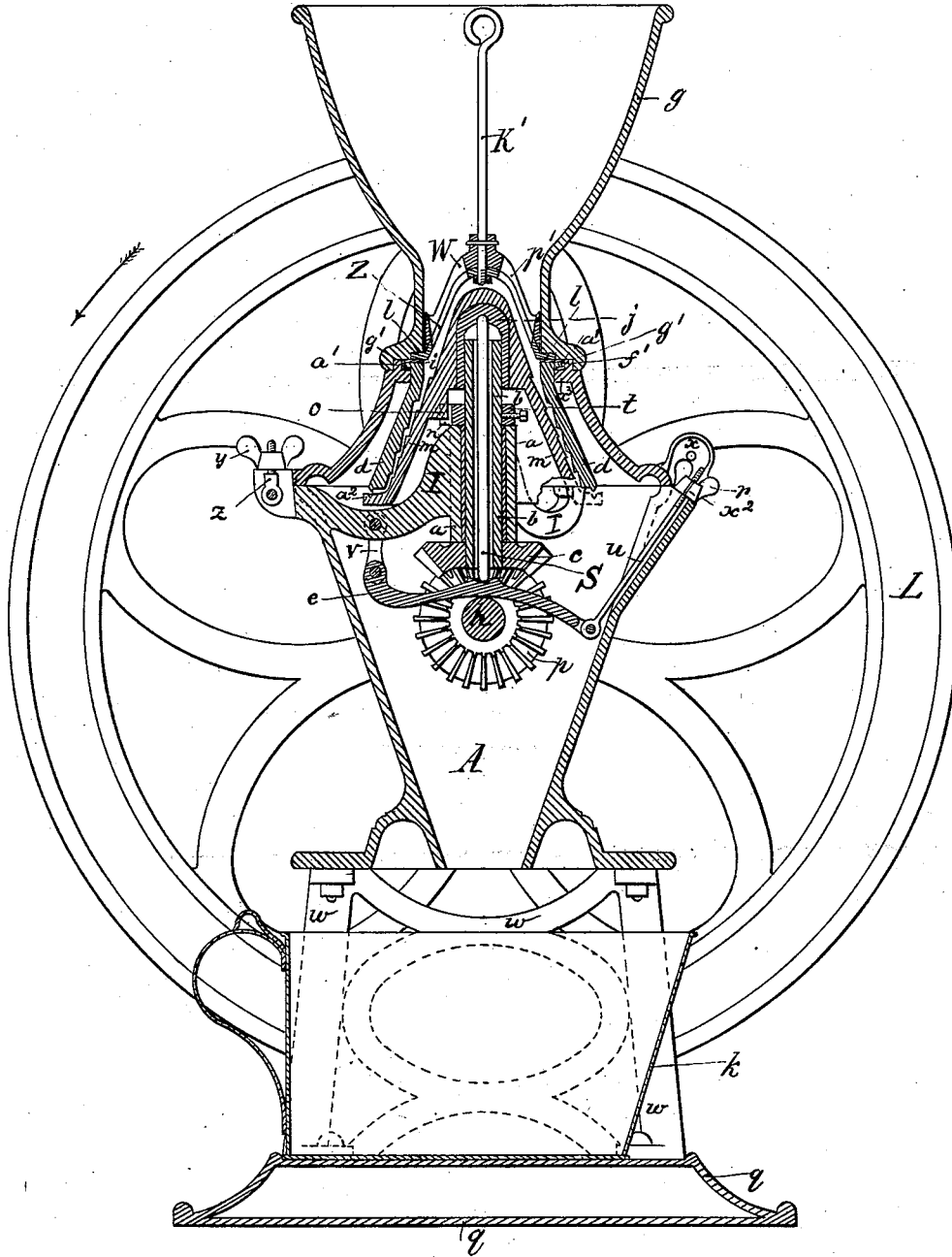
T. & C. D. ROSS,

R. BARRETT and J. C. DUNN, Administrators of T. Ross, deceased.

GRINDING MILL.

No. 253,496.

Fig 1. Patented Feb. 14, 1882.



Witnesses:

*J. P. Theo. Lang.*  
*Robt. L. Fenwick.*

Inventor:

*Crawford S. Ross*  
*Richard Barrett, James C. Dunn*  
*Administrators of Thomas Ross, deceased.*  
*by Messrs. Fenwick & Fenwick*  
*their Attys.*

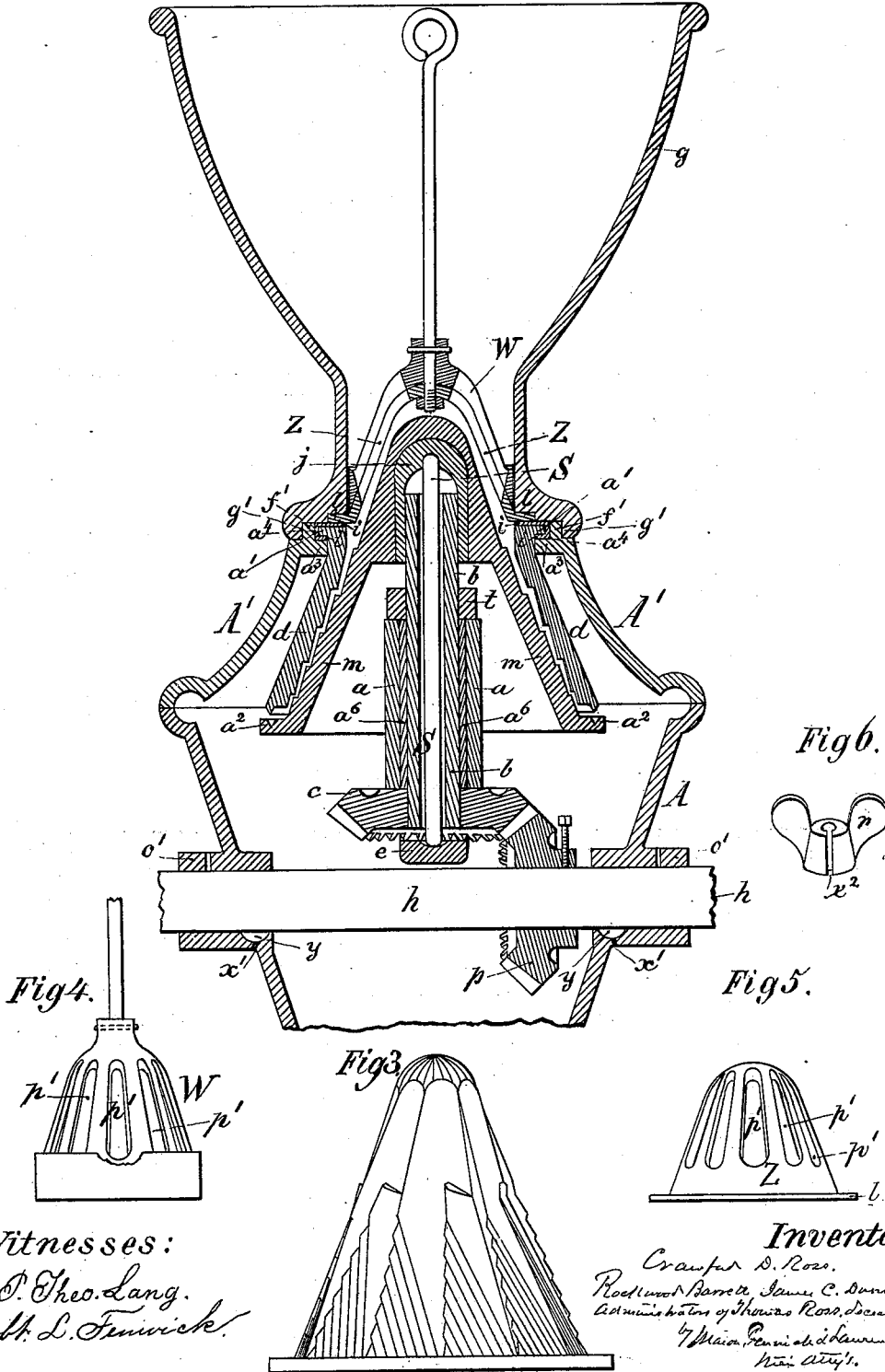
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Fig 2. Patented Feb. 14, 1882.



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*J. P. Theo. Lang.*  
*Robt. L. Fenwick.*

Inventor:  
 Crawford B. Ross.  
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 Administrators of Thomas Ross, deceased.  
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*Wm. Atty's.*

# UNITED STATES PATENT OFFICE.

ROCKWOOD BARRETT AND JAMES C. DUNN, ADMINISTRATORS OF THOMAS ROSS, DECEASED, AND CRAWFORD D. ROSS, OF RUTLAND, VERMONT; SAID CRAWFORD D. ROSS ASSIGNOR TO SAID ADMINISTRATORS.

## GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 253,496, dated February 14, 1882.

Application filed November 10, 1881. (No model.)

*To all whom it may concern:*

Be it known that THOMAS ROSS, late a citizen of the United States, residing at Rutland, in the county of Rutland and State of Vermont, deceased, did in his lifetime, in conjunction with CRAWFORD D. ROSS, a citizen of the United States, residing at Rutland aforesaid, invent a new and useful Improvement in Grinding-Mills, of which the following is a specification.

The object of said invention is the production of a grinding-mill which shall be very efficient in its operation, and with all its working parts readily accessible, said mill relating to that class of grinding-mills used by grocers and families, usually known as "coffee" and "spice" mills.

It consists in certain constructions and combinations of parts, as will be hereinafter described and specifically claimed.

In the drawings, Figure 1 is a vertical central cross-section of the mill constructed in accordance with said invention. Fig. 2 is a vertical central cross-section at right angles to Fig. 1. Fig. 3 is a side elevation of the inner grinding-cone detached from the mill. Figs. 4 and 5 are detail views of the feed-regulating device, and Fig. 6 is a detail view of the split nut of the adjusting-rod of the grinding-cone.

Similar letters indicate corresponding parts in the several figures.

A is a hollow inverted truncated cone, which is designated as the lower case of the mill, and inside of which the gearing for operating and adjusting the grinding mechanism is placed. From the upper edge of this case three arms, I, converge to a central hub, a, which serves as a bearing for an upright hollow shaft, b, said shaft having on its lower end a bevel-pinion, c. The lower case, A, above referred to, rests on and is secured to an upright frame, w, the latter being supported by the base g. A hollow truncated-cone-like case, A', which constitutes the upper case, is connected to the lower case, A, by a hinge, x, thumb-nut y, and pivoted bolt z, as shown in Fig. 1. An adjustable lever, e, is situated inside the lower case, and suspended at one end by the link-plates v, pivoted to an arm, I, of said case, and at its other end by the rod u and thumb-nut r.

S is a rod, which passes freely through the upright hollow shaft b; and the lower end of this rod rests on a concave surface on the upper side of the adjusting-lever e, while the upper end of said rod extends up through the hollow shaft b and supports the inner grinding-cone, m. This grinding or rotating cone is dressed in the ordinary manner, and is constructed hollow and of chilled iron or other suitable hard metal, and incloses a softer metal bearing-shell, j, applied at its apex on the inside, as shown; and as this bearing-shell is of soft metal it can readily be bored true, so as to fit the upper end of the hollow shaft b, which extends up into said shell, while the shell rests on the upright rod S. A collar, as at t, is secured to and is supported by the hollow shaft b, and revolves with it. This collar is made with a vertical slot, n, to engage with a lip, o, projecting from the inside of the grinding-cone m, and so communicate motion to said cone.

An upright hollow truncated stationary cone, as at d, serves as the outside grinding-shell, said cone being provided with lips a', projecting outward from its upper edge and resting upon a flange, a<sup>3</sup>, of an annular recess, a<sup>4</sup>, at the upper edge of the outside upper case, A', said recess being of greater dimensions than lip a', in order to admit soft metal between said lip and the flange f' of said case. These lips are coated with soft metal i, which allows the outer grinding-shell, to which they are attached, to be nicely fitted to a true position for the working of the inside revolving grinding-cone, m.

The hopper, as at g, serves to receive the material to be ground, and at its lower end is provided with a stepped annular recess, g', into which the annular flange f' of the case A' extends, as shown. This hopper rests down upon the soft metal i of the stationary grinding-shell d, as well as upon the flange f' of the upper case, A', and also upon the case A' outside of its flange f', and also upon the flange l of the part Z of the feed-regulator, and is held in position by being bolted to the top edge of said case. By this means the outer grinding-shell, d, is held firmly in position, as well as the part Z of the feed-regulator.

A horizontal shaft, h, passes through both

sides of the lower case, A, and works in fixed bearings *o'*, and carries a fly-wheel, L, on each end, one or both of which wheels are provided with a handle for turning the same. A bevel-gear wheel, *p*, situated inside of the lower case, A, is also carried by the shaft *h*, and said bevel-gear engages with a bevel-pinion, *c*, on the lower end of the hollow upright shaft *b*, and thus by means of these parts and the collar *t* on said shaft *b* rotary movement is communicated to the grinding-cone *m*.

A movable basin, *k*, situated inside of the upright frame *w* and directly under the lower case, A, receives the ground material as it falls through said case.

Z and W together constitute a feed-regulator, consisting of two hollow cones, (see Figs. 4 and 5,) each provided with corresponding oblong openings or perforations, *p'*, through which the material to be ground passes to the two grinding-cones *m* and *d*, situated directly below. The cone Z, when in position, as shown in Fig. 1, is stationary, while the upper perforated cone, W, can be turned by means of the rod *k'*, applied to it for such purpose, in order to regulate the feed or close it off entirely, as circumstances may require.

The bearings *o' o'* for the horizontal shaft *h* are provided with a recess, *y'*, and a drip-outlet, *x'*, to arrest and conduct off the lubricating-oil, which would, if not arrested, get into the inside of the case A, and thence into the coffee or other substance ground in the mill.

The adjusting thumb-nut *r* (shown detached in Fig. 6) has a slot, *x<sup>2</sup>*, in it, as shown, so that it may act with a spring force, and thereby maintain its hold upon the rod *u*, notwithstanding the jarring action of the mill.

The lower edge of the inside grinding-cone, *m*, is provided with three or more projecting lips, *a<sup>2</sup>*, to form a stop against the lower edge of the outside grinding-cone, *d*, and thereby prevent the teeth of the two grinding-surfaces from being brought into actual contact. The hub *a* may be bored out large enough to receive a bushing, as at *a<sup>3</sup>*, which bushing, when worn loose or worn out of true, may be replaced by a new one.

The operation of the mill is as follows: The material to be ground is put into the hopper *g*. The fly-wheel L, with its shaft *h* and bevel-gear *p*, is then turned in the direction indicated by the arrow in Fig. 1. The bevel-gear *p*, engaging with bevel-pinion *c* on lower end of the upright hollow shaft *b*, causes said shaft with its collar *t* to revolve, and by means of the groove *n* in the edge of the collar and the projecting lip *o* the cone *m* is also made to revolve. The material to be ground is free to

enter between the two grinding-surfaces, where it is first acted upon by the coarse grooves of said surfaces, and as it descends lower the cracked material is acted upon by the finer grooves of the grinding-surfaces until it passes out therefrom into the lower case, A, which converges downward to a narrow opening, through which the ground material is discharged into the receiving-basin *k*. By means of the thumb-nut *r*, rod *u*, adjusting-lever *e*, link *v*, and upright rod S the inside grinding-cone, *m*, can be raised or lowered in an almost straight line, and thereby adjusted for grinding either fine or coarse, as may be desired, and this adjustment can be effected without disturbing the working relation of the teeth of the bevel-gear wheels *c* and *p*, as the inner grinding-cone, *m*, is supported entirely by the upright rod S, whose lower end rests upon the adjusting-lever *e*. By turning or loosening the thumb-nut *y* and swinging it out of its slot, and by means of the hinge *x*, the upper case, A', with its outer grinding-shell, *d*, and hopper *g*, can be raised from its position whenever necessary, the same as the cover of a chest.

Having thus described said invention, what is claimed as new, and is desired to be secured by Letters Patent, is—

1. The lower hard-metal or chilled grinding-cone, *m*, provided with the lip *o*, and soft-metal bearing-shell *j*, in combination with the hollow upright shaft *b*, adjusting-rod *s*, grooved collar *t*, and outer grinding-cone, *d*, substantially as and for the purpose described.

2. The upper or outside stationary grinding-shell, *d*, provided with lips *a'*, coated with soft metal *i*, in combination with the outer case, A', provided with flange *a<sup>3</sup>* and annular recess *a<sup>4</sup>*, substantially as and for the purpose described.

3. The outer grinding-shell, *d*, provided with lips *a'* and soft metal *i*, in combination with the case A', provided with flange *f'*, and the hopper *g*, provided with annular recess *g'*, substantially as described.

4. The combination of the hollow stationary perforated feed-cone Z, the upper movable and correspondingly-perforated cone, W, hopper *g*, rod *k'*, and grinding-cones *d* and *m*, substantially as and for the purpose described.

Signed in presence of two subscribing witnesses.

ROCKWOOD BARRETT,  
JAMES C. DUNN,

*Administrators of the estate of Thomas Ross, deceased.*

CRAWFORD D. ROSS.

Witnesses:

WARREN S. GUILFORD,  
FRED. H. SMITH.