(No Model.)

2 Sheets—Sheet 1.

M. W. SHAFER.

COFFEE AND SPICE MILL.

No. 249,110. Patented Nov. 1, 1881.

Fig 1,

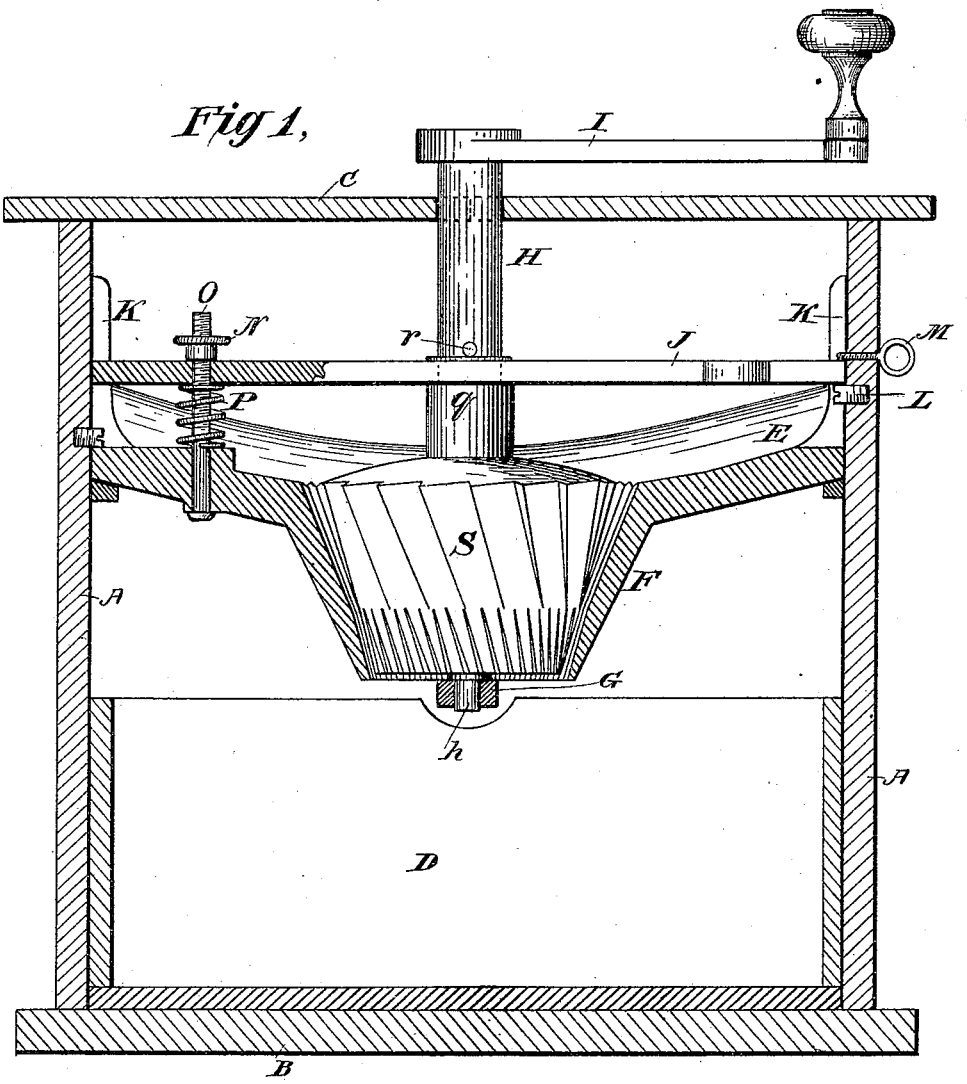
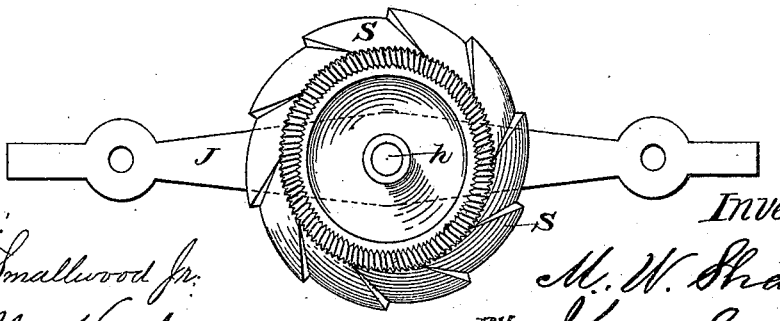


Fig 2,



Attest:
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(No Model.) 2 Sheets—Sheet 2.

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Fig 3,

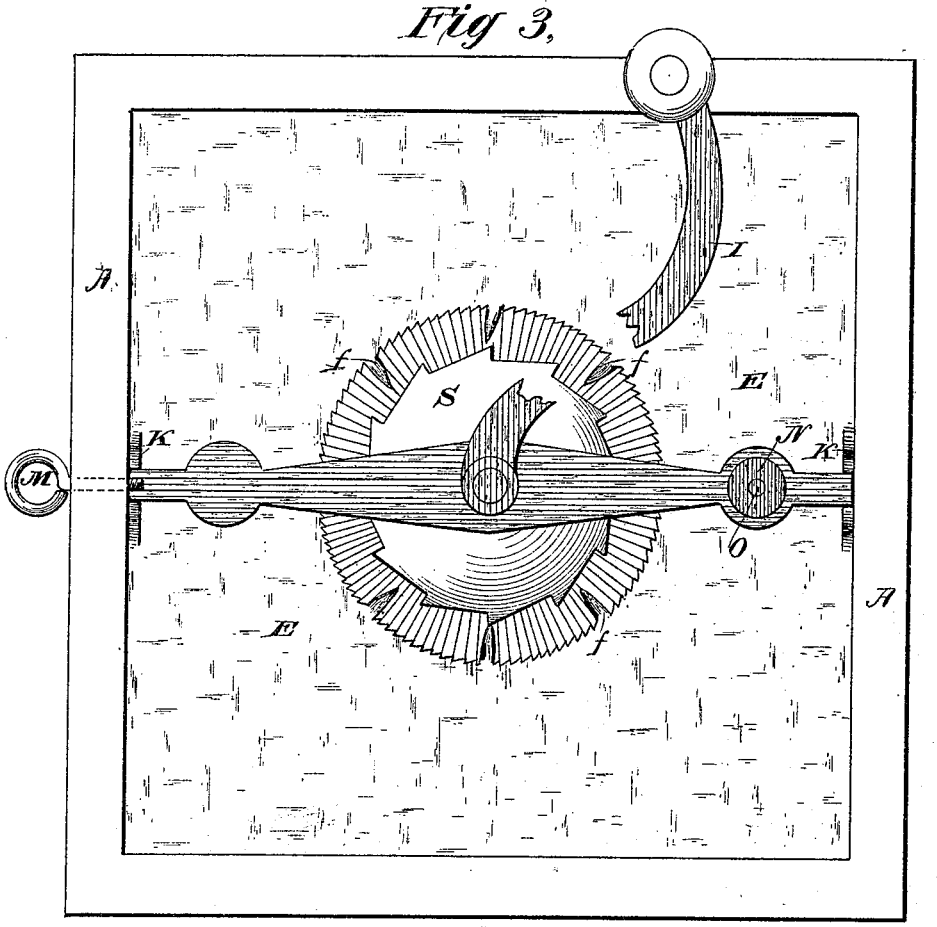
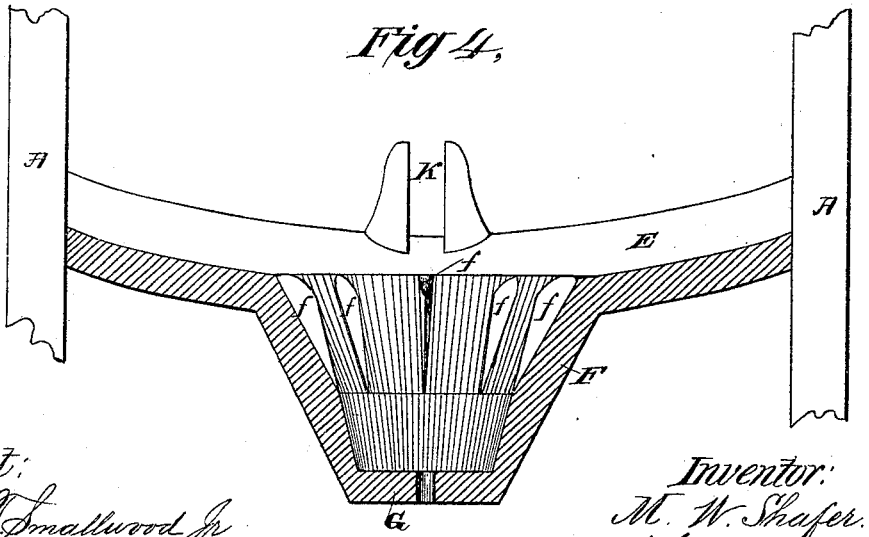


Fig 4,



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UNITED STATES PATENT OFFICE.

MICHAEL W. SHAFER, OF FREEPORT, ILLINOIS.

COFFEE AND SPICE MILL.

SPECIFICATION forming part of Letters Patent No. 249,110, dated November 1, 1881.

Application filed April 7, 1881. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL W. SHAFER, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented an Improvement in Coffee and Spice Mills, of which the following is a specification.

The invention relates to a class of mills consisting of a burr revolved by a vertical shaft within an annular concave.

My improvements consist in combining with a customary casing a hopper-bottom and downwardly-converging conical concave, cast in one piece, a downwardly-converging grinding-burr working in conjunction therewith, and a superposed bridge secured at one end by one or more lugs, and at the other by a bolt and nut for adjusting the burr relatively to the concave, all as hereinafter described; also, in combining with the aforesaid casing, hopper-bottom, downwardly-converging concave, burr, shaft, and superposed bridge, a lower bearing for the shaft, formed on the bottom of the concave, the parts being so arranged and connected as to adapt the burr and bridge and their accessories to be readily removed from the top, as hereinafter described.

In the accompanying drawings, Figure 1 is a vertical section of the mill, showing the shaft and grinding-burr in elevation. Fig. 2 is an under side view of the burr with the bridge in which it has its upper bearing. Fig. 3 is a plan with cover removed. Fig. 4 is a vertical section of the casting constituting the hopper-bottom and grinding-concave, the cutting-plane being at right angles to that in Fig. 1.

A B represent the sides and bottom of the external case of the mill, C the cover, and D the drawer for containing the ground material.

E represents a concave basin or hopper, formed in one piece with a downwardly-converging annular grinding-cone, F, having an open bottom, under which is a transverse bearing, G, for the lower journal, *h*, of the vertical shaft H, which is rotated by a crank, I, in the case of a hand-mill, or by gearing or belt or any other customary or suitable means in power-mills. The upper bearing of the vertical shaft H is in a bridge, J, the ends of which are secured from lateral displacement between parallel ribs or flanges K, projecting upward at diametrically-opposite points from the sides of the hopper E, and from vertical displacement at one end between suitable screws or studs, L M. Its other end is held down to any required position by means of a thumb-nut, N, working on a bolt, O, the bridge being pressed up against the under surface of the nut N by a spring, P. The center of the bridge bears on a collar, *q*, formed to receive it on the shaft H, and may be confined to the said shaft by a pin or stud, *r*, above it. The vertical shaft H carries a grinding-burr, S, formed of cast steel or case-hardened iron, or other suitable material, and with crushing and grinding teeth of approved form, the said grinding-burr working within the grinding-cone or annular concave F, the taper of which is so graduated as to form, in connection with the surface of the grinding-burr S, a downwardly-converging annular space for the crushing and grinding of the material, and delivering it pulverized to any desired fineness at the bottom in the customary manner. Eight (more or less) of the teeth of the grinding-concave are made larger than the others, as shown at *f* in Figs. 3 and 4, said large teeth tapering downward, as do the smaller ones.

It is apparent that the turning down of the nut N on the bolt will force the grinding-burr S downward within the annular concave F, so as to accurately regulate the fineness to which the material may be ground, or on turning up the nut N the bridge J will be correspondingly raised by the pressure of the spring P, and the grinding will be coarser. By removing the cover C of the mill, which is made in two pieces for this purpose, taking off the nut N, and turning the screw L part of the way out, the bridge-piece J, shaft H, and grinding-burr S may be bodily removed with great facility, and the hopper-bottom E and annular concave F, being cast in one piece, may then be readily taken out.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The combination, with the casing A, of the hopper-bottom E and downwardly-converg-

ing conical concave F, cast in one piece, the downwardly-tapering grinding-burr S, the shaft H, the superposed bridge J, one or more supporting lugs or screws, L M, the adjusting-bolt and nut O N, for forcing the burr downward within the converging concave through the medium of the bridge, and the supporting-spring P, bearing the bridge upward in opposition to the nut N, as and for the purposes described.

2. The combination of the casing A, hopper-bottom E, downwardly-converging grinding-concave F, bearing G, shaft H, burr S, and superposed bridge J, constructed and arranged substantially as described, and admitting of the ready removal of the bridge and burr from the top.

MICHAEL W. SHAFER.

Witnesses:
CYRUS TOBIAS,
ESROM MAYER.