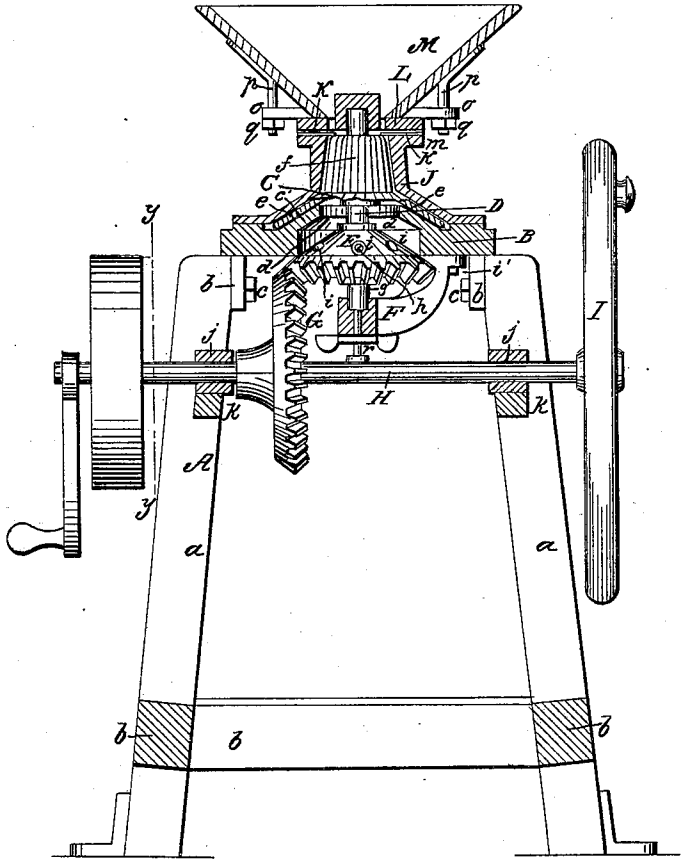
2 Sheets—Sheet 1.

S. S. HOWARD.

Grinding Mill.

No. 40,078. Patented Sept. 22, 1863.

Fig: 1.



Witnesses:
J. W. Coombs
Geo. Reed

Inventor:
S. S. Howard
per Munn & Co
Attorneys

N. PETERS, Photo-Lithographer, Washington, D. C.

2 Sheets—Sheet 2.

S. S. HOWARD.

Grinding Mill.

No. 40,078. Patented Sept. 22, 1863.

Fig: 2.

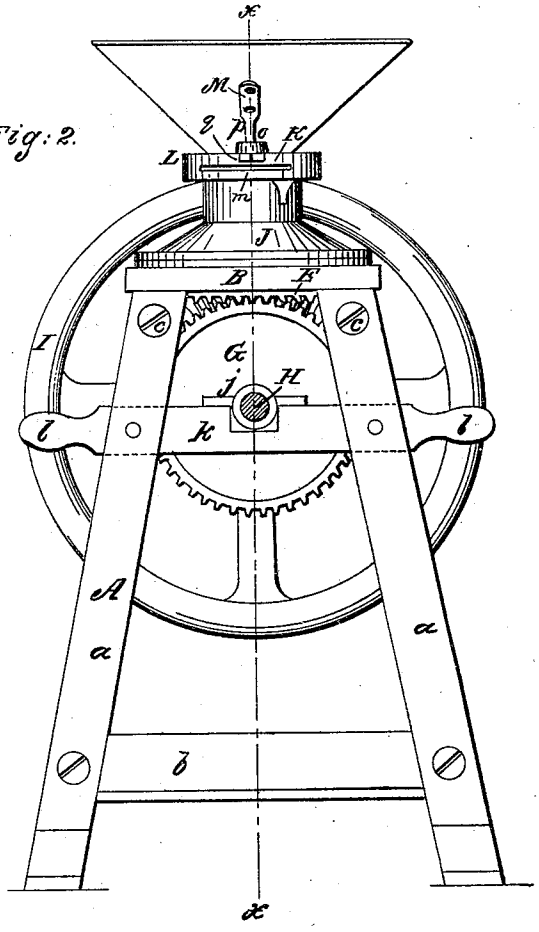
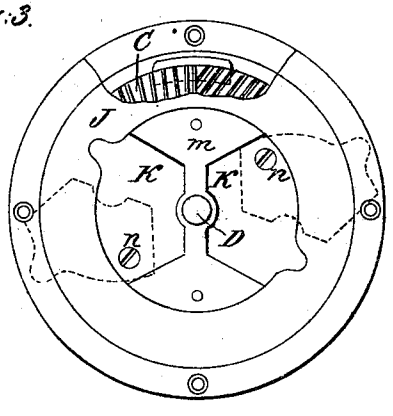


Fig: 3.



Witnesses:
J. W. Coombs
G. W. Reed

Inventor
S. S. Howard
per Munn & Co
attorneys.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

S. S. HOWARD, OF MILTON, NEW YORK, ASSIGNOR TO EDGAR D. GILLIS, OF SAME PLACE.

IMPROVEMENT IN GRINDING-MILLS.

Specification forming part of Letters Patent No. **40,078**, dated September 22, 1863.

To all whom it may concern:

Be it known that I, S. S. HOWARD, of Milton, in the county of Ulster and State of New York, have invented a new and Improved Grinding-Mill; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side sectional view of my invention, taken in the line *x x*, Fig. 2; Fig. 2, a side elevation of the same, the driving-shaft being in section, as indicated by the line *y y*, Fig. 1; Fig. 3, a plan or top view of the same, the hopper and hopper-plate being removed.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain improvements in that class of grinding-mills which are portable and designed for domestic purposes—such, for instance, as grinding feed for stock.

The invention consists in constructing and arranging certain parts of the mill in such a manner that it may be furnished at a much less cost than those of a similar kind hitherto constructed, and possess other advantages hereinafter stated.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents the framing of the mill, which is of wood, constructed of four inclined posts, *a*, connected near their lower ends by cross-bars *b*.

B represents a cast-iron plate of rectangular form, which rests upon the upper ends of the posts *a* of the framing, and is provided at each corner with a pendent ear or lug, *b*, which abut one against the inner surface of each post *a*, and have screw-bolts *c* passing through them into said posts. This plate B serves to stiffen the framing A, and obviates the necessity of employing braces or cross-bars at the upper part of the framing, and at the same time said plate serves as a bed for the mill. The plate B has a conical eminence, C′, at the center of its upper part, and an opening, *d*, is at the center of said plate, said opening being of larger diameter at its lower than at its upper end, and extending entirely through the plate, as shown in Fig. 1.

C represents a rotary grinder, the lower part, *e*, of which is of conical form, and fits over the conical part *c* of the plate B. The upper part, *f*, of the grinder is quite slightly conical, and is much less in diameter than *e*, as shown in Fig. 1. This grinder C is fitted on a vertical shaft, D, which extends down through the opening *d* in plate B, and has a dish-shaped bevel-toothed wheel, E, upon it, said wheel projecting upward in the opening *d*, and having a hub, *g*, through which a set-screw, *h*, passes into the shaft D, and secures the wheel E to said shaft. The hub *g* is entirely within the dish or hollow of the wheel E, and the latter is cast in skeleton form or with holes *i*, to admit of a screw-driver being passed through it to reach the screw *h*, in order to detach the wheel E from its shaft D, which is necessary in order to admit of the grinder C being removed from the mill.

The grinders, it will be understood, when worn by use, are removed and new ones used instead, and by this arrangement of the wheel the latter may be readily detached from its shaft D and applied to it to facilitate the application of new grinders when required. This is an important feature of the invention, for with the ordinary mills in use there is considerable difficulty attending the adjustment of new grinders to them.

The lower end of the shaft D is fitted in a bridge-tree, F, the ends of which are secured to the plate B by screw-bolts *i′ i′*, (see Fig. 1,) and the wheel E gears into a wheel, G, which is placed on a driving-shaft, H, the latter having a horizontal position, and its bearings *j j* being secured to cross-bars *k k* in the upper part of the framing A. These cross-bars may be sufficiently long to project beyond the posts *a* to form handles *l* at two opposite sides of the framing, as shown in Fig. 2. By this arrangement I avoid the heavy and expensive casting usually employed at the upper part of the framing A, and on which the bearings of the shaft H are cast, and are enabled to remove the bearings of said shaft whenever they become worn by use, and replace them by new ones at a very trifling expense. The shaft H is provided with a fly-wheel, I, at one end, and the former may be driven by horse or other convenient power.

J represents a cast-iron cap of conical form corresponding to the form of the grinder C,

which it covers. This cap is bolted to the plate B, and it has a horizontal flange, *m*, at its upper end, on which two plates, K K, are secured by screws *n n*, as shown clearly in Fig. 3. These plates are allowed to work freely on the screws *n*, and directly over them and upon the flange *m* there is secured by screws or bolts an annular plate, L, which is provided with two ears or lugs, *o o*, the latter projecting horizontally from the plate L, as shown clearly in Fig. 1. The under surface of the plate L has recesses made in it to admit of the plates K K being adjusted or turned freely on their screws *n*, and to the plate L the hopper M is secured, said hopper being of the usual form and having two pendent rods, *p p*, attached to it, which pass through the ears or lugs *o o*, and have nuts *g* on their lower ends. By this arrangement the hopper M is firmly secured in position, and ample space allowed for the adjustment of the plates K K. These plates K K perform an important function—to wit.. they admit of the grain being fed to the mill more or less rapidly, or cut off entirely, as required. This is a great advantage, for frequently in starting a mill of this kind the grain, in consequence of passing freely into it before the grinder rotates with a proper speed, chokes up the mill. The plates K, it will be seen, regulate the feed in consequence of being made to cover the orifice of the cap J, more or less.

I would remark that the exterior of the grinder C and the exterior of the cap J are corrugated in the usual or any proper way, and that the grinder may be raised and lowered by means of a screw, *r*, in the bridge-tree F.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The arrangement of the feed-regulating plates K K, between the cap J and the plate L, substantially as and for the purpose herein shown and described.

2. The annular plate L, provided with the ears *o o*, in connection with the pendent rods *p p*, attached to the hopper M, and passing through the ears or lug *o o*, for the purpose of securing the hopper to the mill and rendering the plate K accessible for adjustment.

S. S. HOWARD.

Witnesses:

ROBERT J. DICKEY,

EDWARD NEAR.