HEMPHILL & KNOX.

Grinding Mill.

No. 5,836. Patented Oct. 10, 1848.

Fig. 2

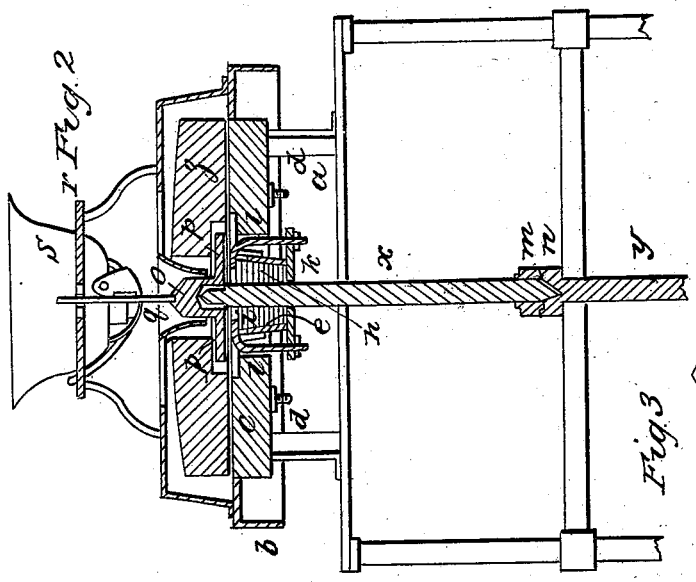


Fig. 4

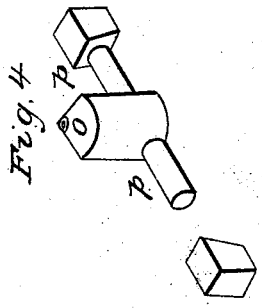


Fig. 3

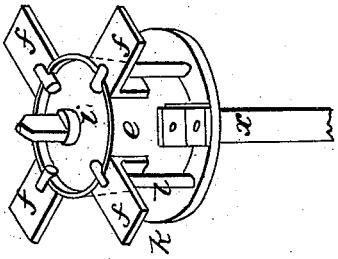
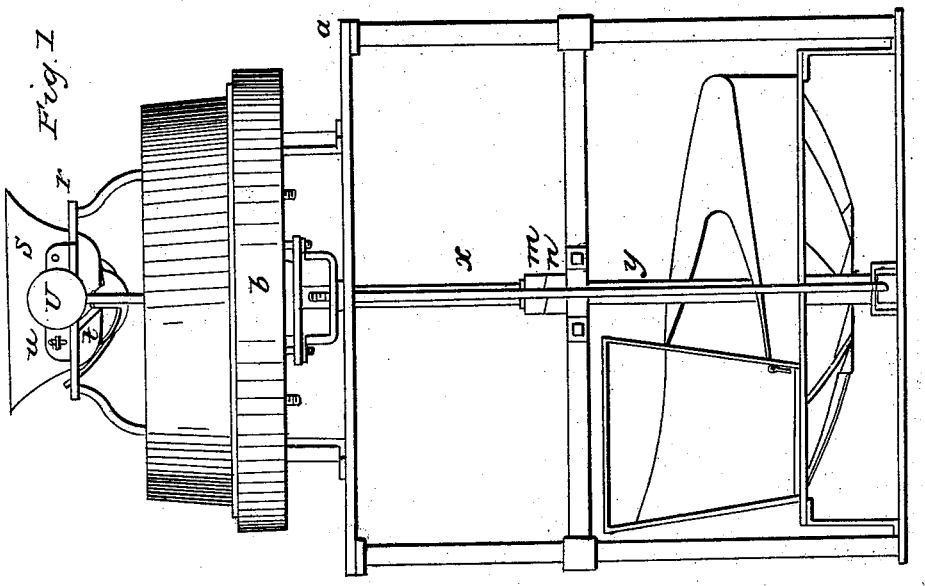


Fig. 1



UNITED STATES PATENT OFFICE.

F. M. HEMPHILL AND R. H. KNOX, OF WASHINGTON, OHIO.

MILL FOR GRINDING.

Specification of Letters Patent No. 5,836, dated October 10, 1848.

To all whom it may concern:

Be it known that we, FRANCIS M. HEMPHILL and ROBERT H. KNOX, of Washington, in the county of Fayette and State of Ohio, have invented certain new and useful Improvements in Mills for Grinding Grain, &c., and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known and of the usual manner of making, modifying, and using the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation, Fig. 2 is a vertical section through the center of the stone, &c., Fig. 3 is the bush detached, Fig. 4 is the balance rind and driver detached.

The same letters refer to like parts in all the figures.

The nature of our improvements in mills for grinding consists in the manner of attaching the spindles to the water-wheel shaft; the driver and balance rind formed in one piece; the stationary center or eye in the runner, and in the manner of bushing the spindle.

The construction is as follows: upon the platform (*a*), or floor of the mill, instead of forming the usual wooden husk, we make a circular iron rim a cross section of which is rectangular (*b*) supported upon four legs, which are firmly bolted to the floor, leaving a space underneath open, through which the air is at liberty to circulate; in this rim the bedstone (*c*) is fixed and supported on timbers (*d*) that extend across under it on each side; bolts pass through the ends of these timbers, and up through the rim (*b*), and are there headed; the lower ends of these bolts have screws cut on them, on which nuts are put, by which the bedstone can at any time be levelled, the parts being readily got at; in the center of the bedstone the husk is placed; it is composed of an outer rim (*e*), more clearly shown in Fig. 3; this rim is circular and is smaller at the bottom than the top, like an inverted truncated cone, from its upper edge four wings (*f*) project, that are firmly beaded into the bedstone; within this rim or outer case, rings of leather (*h*) are introduced to pull up the rim, and just to fit close around the spindle (*x*); above these there is a metal plate or follower (*i*) to hold them down, on the bottom a plate (*k*) is fastened and through a flanch thereon four bolts (*l*) pass, the upper ends of which are hook formed and catch over the plate (*i*); their lower ends are threaded for nuts, which serve to draw down the bolts, and with them the follower, to tighten the leather around the spindle, which effect is aided by the conical form of the rim, which gradually contracts the leather toward the spindle; slots are cut in the side of the rim for the purpose of letting the hooks pass down, and when the bush cannot be tightened by screwing down the follower, the bottom plate must be removed, one of the leathers taken out, and another put in at top; this bush is readily accessible and can be tightened while the mill is running.

The spindle (*x*) is stepped directly upon the upper end of the water wheel shaft (*y*), which is recessed for that purpose; above the bearing end the spindle is for a short space square, and on it there is a toothed clutch (*m*) which is free to slide up and down, but must turn with the spindle; a similar clutch (*n*) is dropped on the upper end of the shaft (*y*); by this arrangement, if the water wheel becomes impeded, or suddenly stopped, the spindle and runner will continue in motion without endangering any part of the machinery, an accident of very common occurrance in ordinary mills.

The runner (*z*) is supported on the spindle by means of a balance rind and driver, all in one piece, so constructed as to play in all directions while it is steadily driven; the upper end of the spindle is pointed, below which it is flattened, this part enters an oblong mortise in the center of the balance rind, which is then enlarged into a boss (*o*), from which project two round arms (*p*) which have their ends inserted in two bearings that are imbedded in the runner; the balance rind has a play one way on the spindle, and turns on its journals the other, thus forming a universal joint between the runner and spindle; over the runner the usual hoop is placed, to which is attached a tube of metal (*q*) that fits into the eye of the runner, and which we denominate a stationary eye; it is for the purpose of obviating a difficulty well known to millers, of choking the eye, especially when the grain is damp, and the stone is running at high velocities; the grain is very apt to stick against the side of the eye of the run-

ner by centrifugal force, till enough accumulates either to choke the eye or clog the stones, by this improvement, which is aided by the flaring shape in which we make the lower part of the mill eye prevents all tendency to clog, a thing so much desired by millers. On the top of the hoop the frame (*r*) of the hopper is situated, this hopper (*s*) is bell shaped and made of metal; the shoe is made and hung similar to those now in use, but the cord (*t*) at the toe of the shoe instead of passing around a peg to regulate the feed, as is usual, is attached to a short lever (*u*) that is regulated with a screw (*v*), by which a more perfect action is had.

Having thus fully described our improvements, what we claim therein as new, and for which we desire to secure Letters Patent, is—

1. The method of connecting the spindle with the shaft of the water wheel as set forth, the whole being raised and lowered together, and the spindle having liberty to turn without the wheel as above described.

2. We claim the stationary center or eye to the runner, in combination therewith the flaring of the runner below, to prevent the grain clogging in the eye of the stone as herein particularly described.

FRANCIS M. HEMPHILL.
ROBERT H. KNOX.

Witnesses:
J. J. GREENOUGH,
R. D. GRANGER.