J. WEIS.

Flour Mill.

No. 14,179. Patented Jan. 29, 1856.

Fig. 1

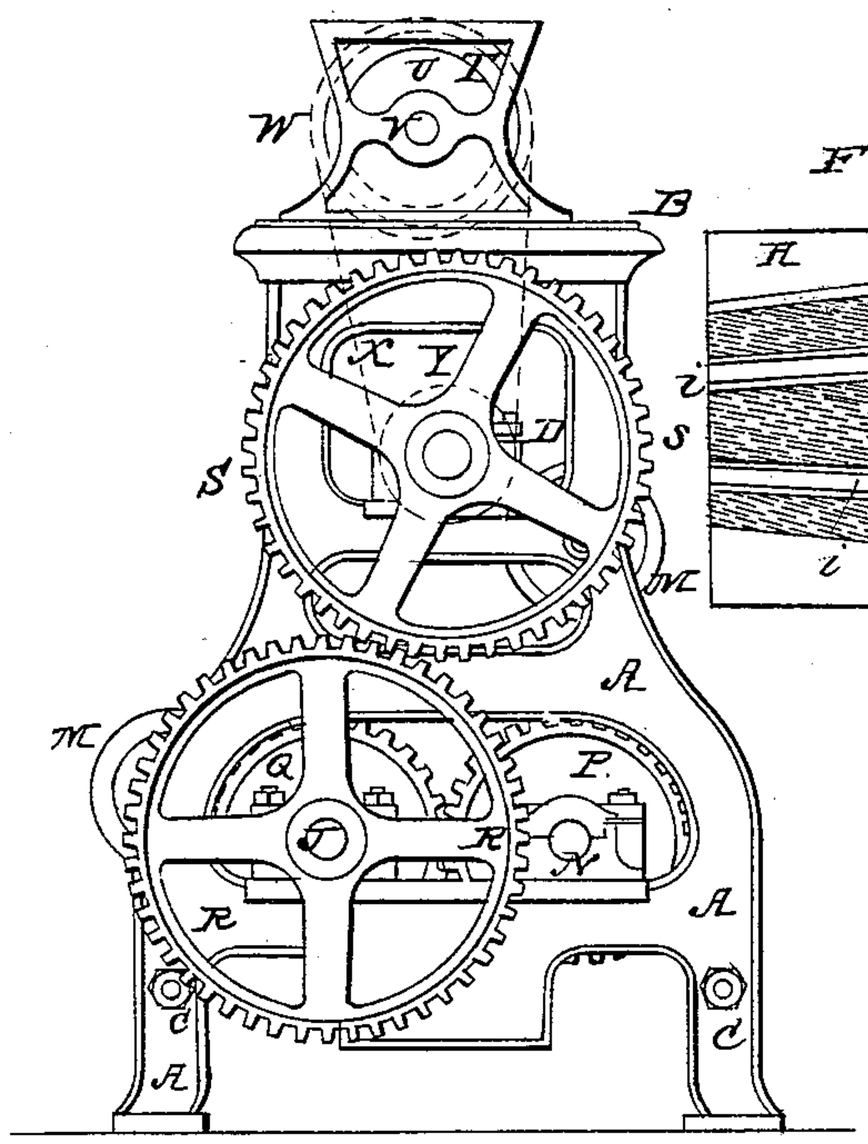


Fig. 6.

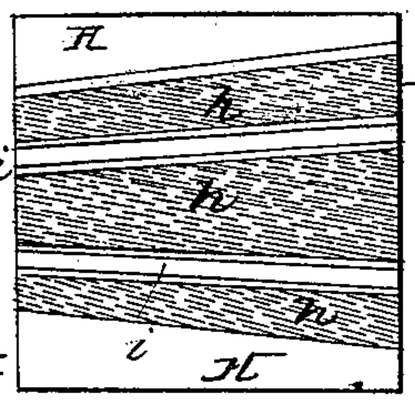


Fig. 2

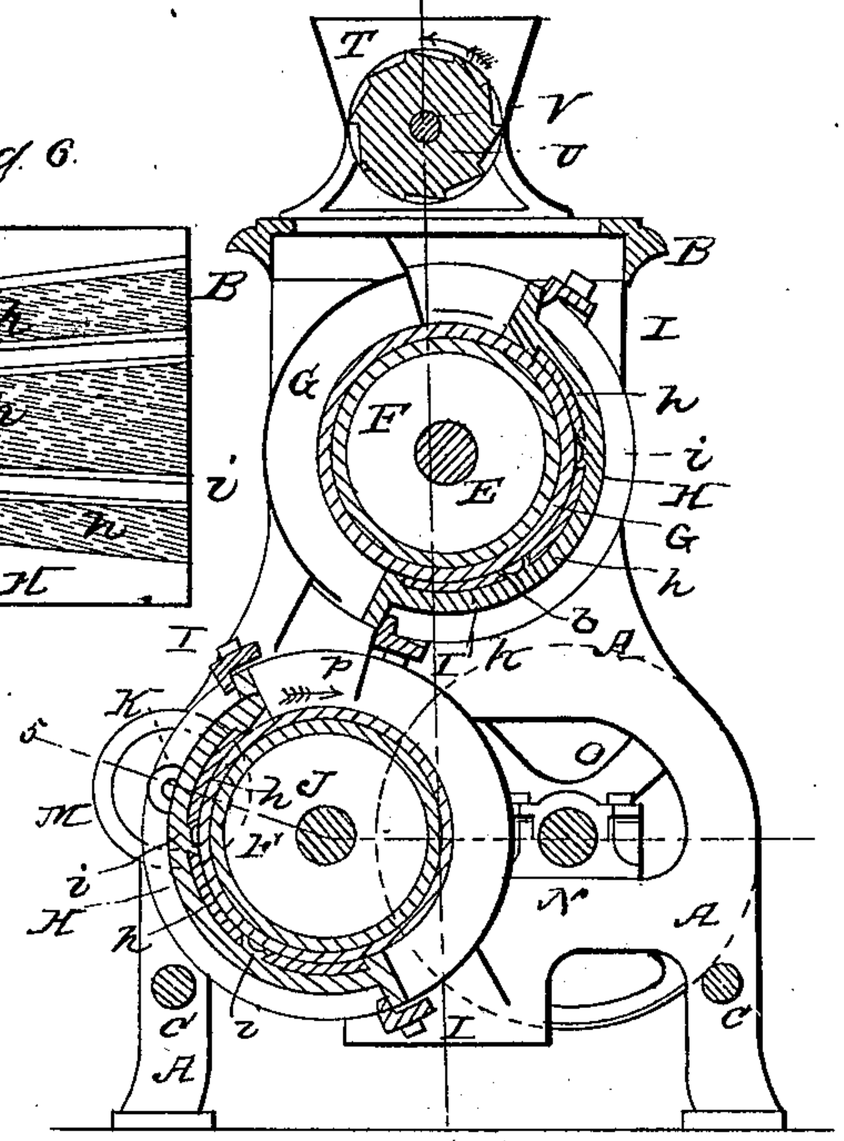


Fig. 4

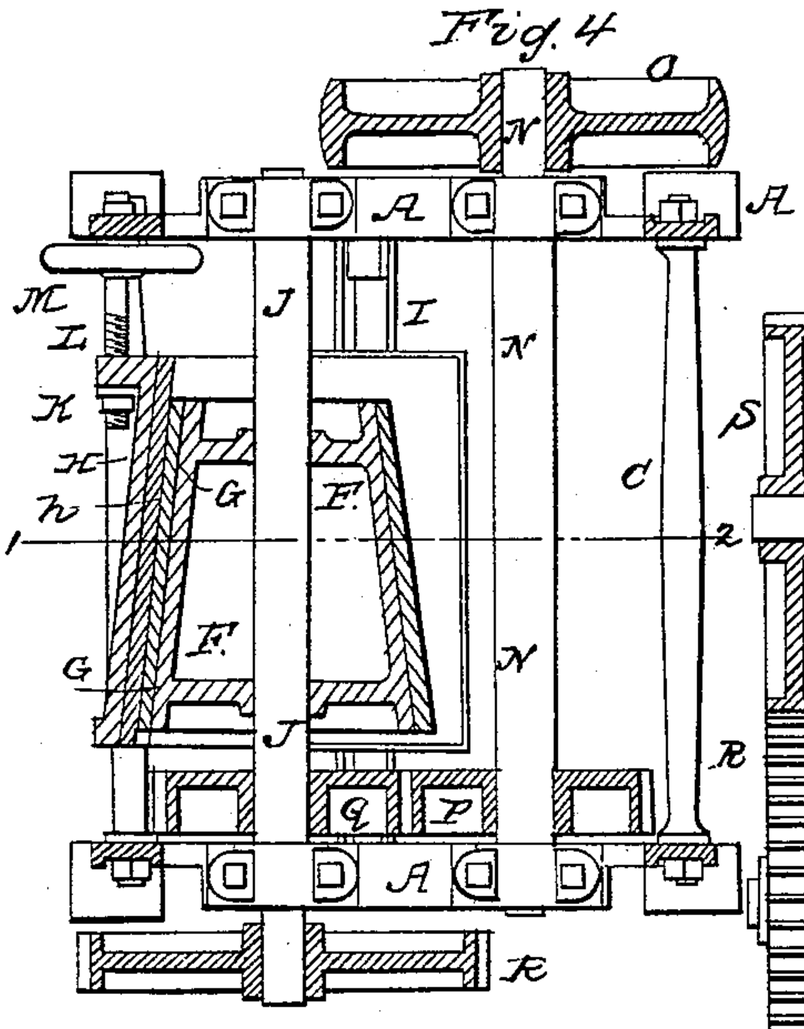
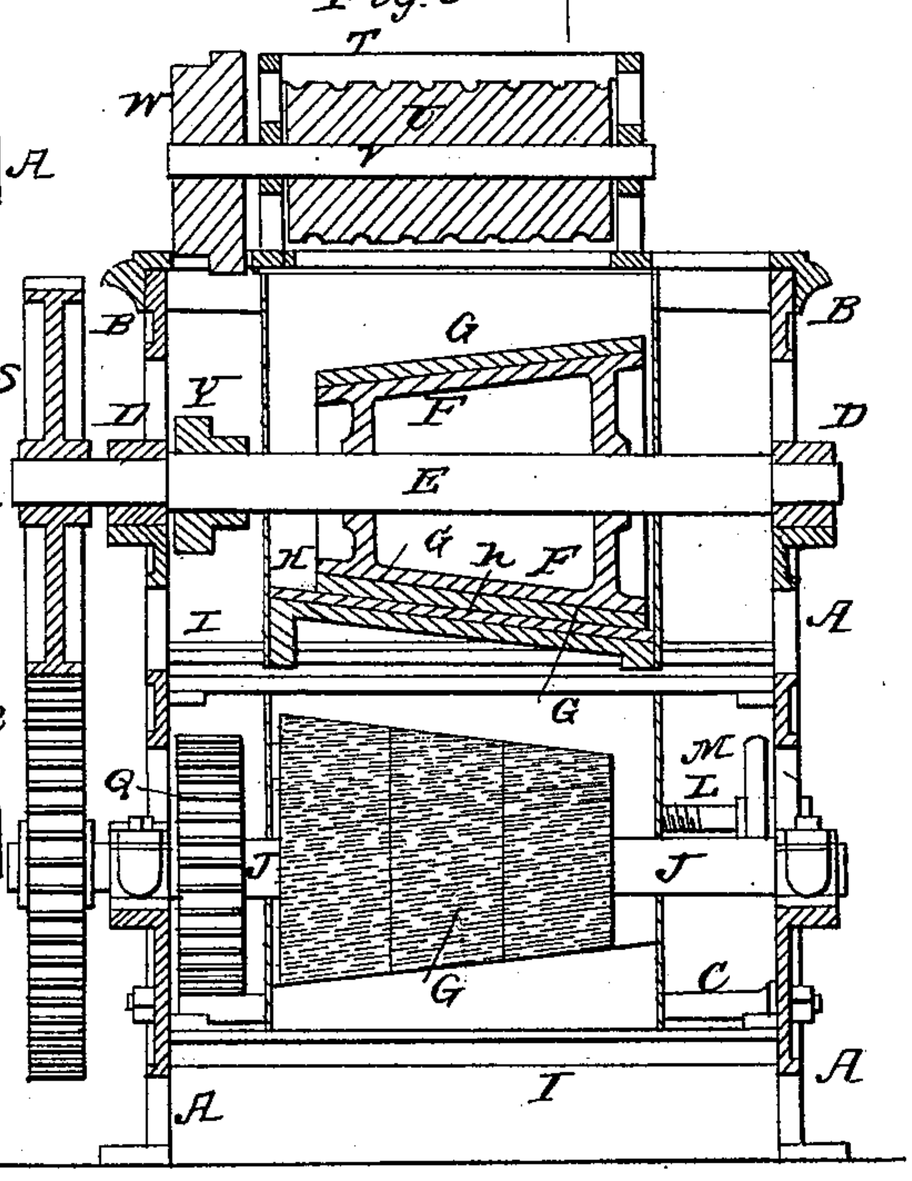


Fig. 3



UNITED STATES PATENT OFFICE.

JOSEPH WEIS, OF BORDENTOWN, NEW JERSEY.

FLOURING-MILL.

Specification of Letters Patent No. 14,179, dated January 29, 1856.

To all whom it may concern:

Be it known that I, JOSEPH WEIS, of Bordentown, county of Burlington, and State of New Jersey, have invented certain new and useful Improvements in Flouring-Mills; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the figures and letters of reference marked thereon.

My invention relates to flouring mills in which the grain is acted upon by metal grinding surfaces, and consists in covering the entire surface of a tapering cast iron bur with a hoop or hoops of cast steel, on the entire surface of which I cut a series of teeth in disjointed lines obliquely with the axis of the bur. This steel covered tapering bur I cause to revolve with its circumference in proximity with the inside surface of a semicircular tapering shield which is allowed to slide laterally on guides secured permanently to the frames of the machine the same guides preventing the shield from turning with the bur. On the inside of this shield are dovetailed longitudinal pieces of cast steel with longitudinal grooves between each piece. The dovetailed pieces are curved and tapering so as to assimilate to the circumference of the bur and on their concave surfaces are also cut teeth oblique with the axis of the bur, but inclined in a contrary direction to those of the latter. By an adjusting screw connected to the frames of the machine and acting on a nut attached to the shield the latter may be moved backward and forward on the guides in a line parallel with the axis of the bur so that the concave surface of the shield with its file cut steel pieces may be brought in more or less proximity with the steel faced bur. The grain is submitted to the action of the bur and shield combined, the teeth of which being inclined in contrary directions cross each other and have a most powerful cutting and grinding effect on the grain. The longitudinal grooves between the dovetailed steel pieces serve the purpose of catching the grain after it passes over one set of teeth and changes its course before it is picked up by the next steel piece. The grain leaves the shield at the point where the latter terminates and is guided so as to drop on the circumference of a sceond steel covered tapering bur, and passing between that and a second tapering shield is discharged below, ground to the consistency required. The whole is so geared and arranged as to occupy but little space compared with its efficiency, and has the additional advantage over the ordinary bur stones of being adapted to grind damp grain. On account of the peculiar construction of the teeth, my mill separates the bran from the grain more effectually so that the flour is manufactured more purely white and free from that reddish color common to flour manufactured by the usual process.

In order to enable others skilled in the art to make and use my invention I will now proceed to describe its construction and operation.

On reference to the drawing which forms a part of this specification, Figure 1 is an end elevation showing the exterior of my improved flouring mill; Fig. 2, a transverse sectional elevation of the same on the line 1, 2, (Fig. 4); Fig. 3, a longitudinal sectional elevation of the mill on the line 3—4, (Fig. 2;) Fig. 4, a sectional plan on the line 5—6, (Fig. 2;) Fig. 5, an inside view of one of the shields.

A, A, are the two side frames of the machine which are connected together at the top of the entablature B and toward the bottom by the cross stays C. To each of the frames A are secured the pedestals D, D, which form the bearings for the shaft E. To this is secured the circular tapering bur F around which is tightly secured the cast steel covering G which may be formed of one piece or of a series of hoops with their edges in contact with each other. Having turned the steel surface of the bur I cut thereon a series of teeth similar to those of an ordinary coarse file the said teeth being cut in disjointed lines obliquely with the axis of the bur.

H is a semicircular tapering shield of cast iron having flanges on each side and notched so as to fit the guides I which are parallel with the axis of the bur and their ends being permanently secured to the inside of the opposite frames. Three or more steel pieces *h* are fitted in dovetailed grooves cut longitudinally inside the tapering shield H so that their surfaces may assimilate to the circumference of the steel covered bur. Between each of the steel pieces *h* are the longitudinal grooves *i* for a purpose hereafter referred to. The concave surfaces of the steel pieces *h* have likewise file cut teeth also obliquely with the axis of the bur, the ob-

liquity of the teeth on the bur and of those on the steel pieces *h* being in contrary directions. Below the shaft E is a second shaft J which has also its bearings on the opposite frames of the machine. On this shaft is a tapering bur with steel covering similarly to that above described and in proximity with this is a semicircular tapering shield similar to that above referred to and guided in ways I in a similar manner. In order to bring the concave surface of the semicircular shield and that of the steel covered bur closer to or farther from each other, I attach to the inside of one of the flanges of the shield a nut K for the reception of the screw L the end of the latter being connected to the frame A so as to swivel therein without having any lateral movement. The screws L are furnished with handle wheels M so that on turning the screws by the same, the shields may be made to slide backward and forward on the ways I and their file cut steel pieces consequently brought nearer to or farther from the file cut surfaces of the steel covered burs.

N is the driving shaft having also its bearings on the opposite frames A A. This shaft is furnished with a driving wheel on one side of the machine for receiving the driving strap and has a spur wheel P inside the frames which gearing into a similar wheel Q on the shaft J causes the latter and with it the steel faced bur to revolve in the direction of the arrow. Outside the machine the shaft J is furnished with another spur wheel R which gearing into the wheels on the shaft E causes the upper bur to revolve in the direction of its arrow, so that on turning the pulley N the upper and lower bur have a simultaneous movement imparted to them.

T is the hopper secured to the top of the frame and in the lower mouth of this hopper is the roller U on the surface of which are a series of indentations *t*. The feed roller is attached to the shaft V which has its bearings on the ends of the hopper and is furnished with two or more different sized pulleys W around either of which may pass the strap X from the pulleys Y on the shaft E so that the strap may be passed from one set of pulleys to the other and the speed of the feed roller consequently altered at pleasure.

Operation of the mill: The grain to be ground being placed in the hopper the machine is set in motion by a strap from any adjacent shaft operating on the pulley O. This causes the feed roller U to turn in the direction of the arrow. Now as the circumference of the feed roller is in close proximity to the lower edge of the hopper the grain can escape by no other means than by entering the indentations of the said roller which carries certain quantities past the edge of the hopper in the direction of the arrow and allows limited and regular quantities of grain to drop onto the circumference of the tapered steel covered roller F at the point where the upper portion of the semicircular shield H terminates. The grain is now carried between the shield and the bur and is acted upon by the oblique teeth on the pieces *h* and those on the steel covering of the bur and as these teeth slant in contrary directions the cutting effect on the grain will be most powerful, and this efficiency is increased by the longitudinal grooves *i* which as the bur revolves catch the grain and turn its direction between each of the pieces *h*. The grain thus partially ground on leaving the point where the lower portion of the upper shield terminates drops down a slide *p* onto the circumference of the lower bur where it is again acted upon by the teeth on that bur and those on its shield, and being still further ground thereby, is discharged below into any convenient receptacle. When it becomes necessary to grind the grain finer or coarser by turning the screws L the shields may be brought in closer proximity with or further from the bur and the desired effect thereby accomplished.

In order to prevent the grain from flying I cover the burs with guards of sheet iron or other suitable material.

The whole mill does not occupy a space more than 40 inches in height and 28 inches in width the cylinders being 14 inches long and 12 inches in diameter at their largest ends so that the whole may be readily moved about from place to place. This mill in addition to its diminutive size has considerable advantage over the common bur stones on account of the rapidity of friction in the former while in the latter the grain has to pass around the stone in a serpentine direction.

When the teeth become worn by continual use the steel pieces in the shield as well as the steel covering of the bur may be recut with facility.

I do not desire to confine myself to any particular number of shields and burs as in some cases one bur and one shield only may be found sufficient in other cases two of each and occasionally more may be required.

What I claim and desire to secure by Letters Patent is,

The longitudinal grooves *i* between the dovetailed steel pieces, constructed and arranged in the manner set forth and for the purpose specified.

JOSEPH WEIS.

Witnesses:
THOMAS BENNETT,
LEWIS RAU.