G. SANDFORD.

Grinding Mill.

No. 22,515. Patented Jan'y 4, 1859.

Fig. 3.

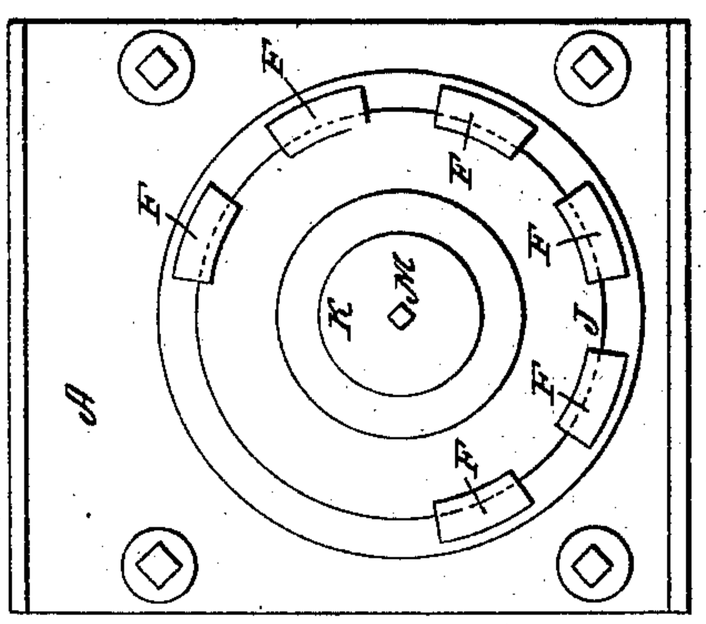


Fig. 6.

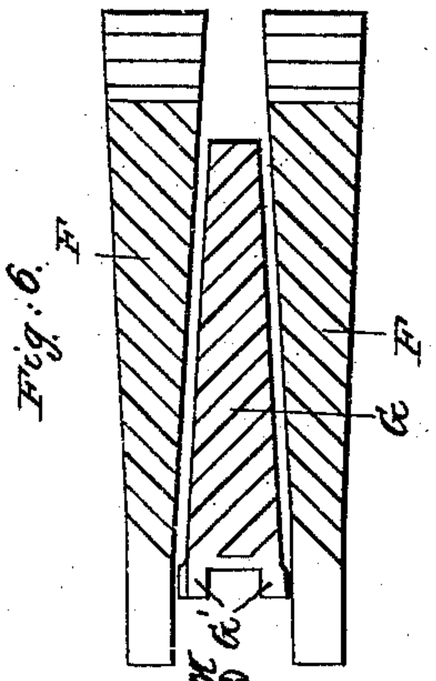


Fig. 2.

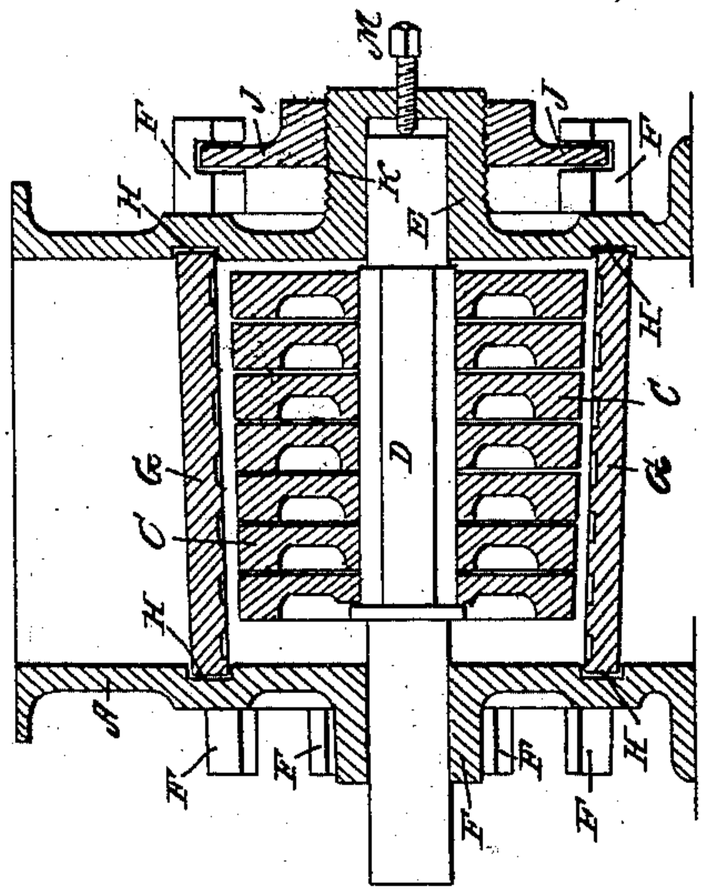


Fig. 5.

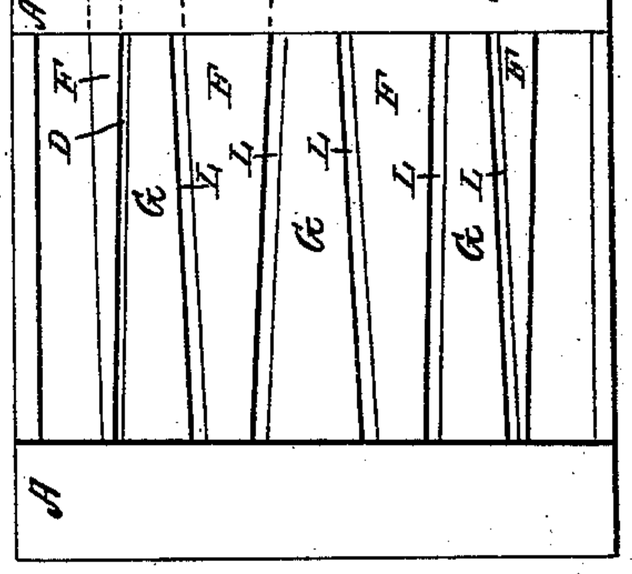


Fig. 1.

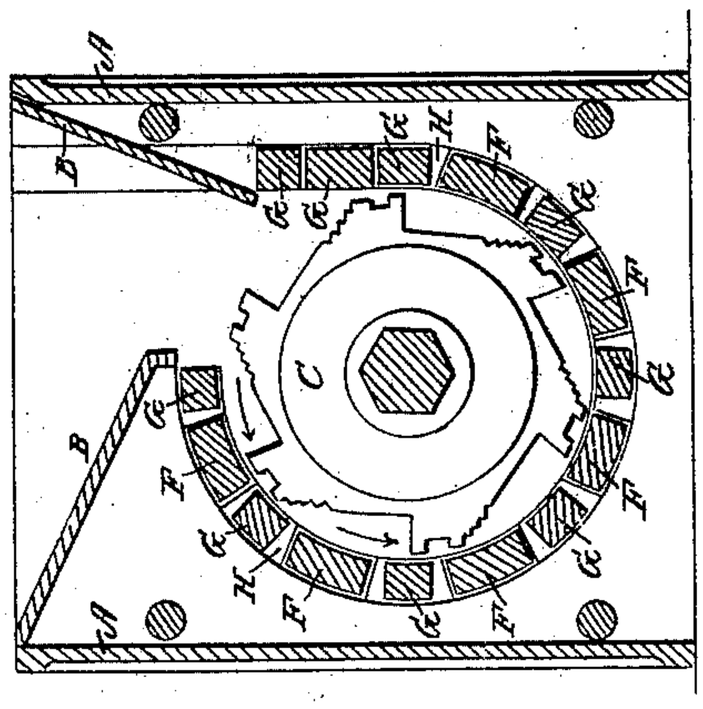
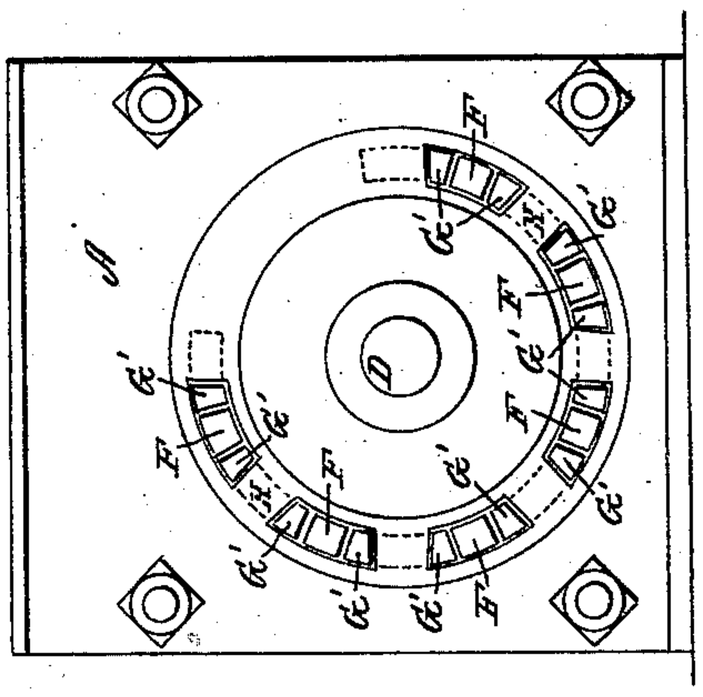


Fig. 4.



UNITED STATES PATENT OFFICE.

GELSTON SANFORD, OF POUGHKEEPSIE, NEW YORK.

GRINDING AND CRUSHING MILL.

Specification of Letters Patent No. 22,515, dated January 4, 1859.

To all whom it may concern:

Be it known that I, GELSTON SANFORD, of Poughkeepsie, in the county of Dutchess, in the State of New York, have invented a new and improved mill for grinding corn and other grains, seeds, and similar substances and by reversing the direction of the motion of the grinding-surfaces is adapted to crushing or grinding corn-cobs and apples; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference thereon.

My invention consists first, in combining a horizontal rotating frustum of a cone, the periphery of which is provided with suitable rough surfaces for grinding, with a horizontal concave or shell, concentric with the periphery of the cone and surrounding the same as far as consistent with the necessary opening for a hopper, and formed of a number of taper sections, or staves a part of which are adjustable by a flange screw nut common to them, so that by operating the set screw nut a space wider or narrower between the staves may be opened at the pleasure of the operator, the width of the openings regulating the escape of the ground material the same being confined within the concave until ground sufficiently fine to pass between the staves. Second, in constructing the rotating grinding cone with irregular surfaces or teeth more particularly to be hereinafter described, so contrived and arranged that although while moving in one direction it operates well on small grains, it will if the direction of the motion is reversed take in and grind and crush larger bodies with facility, such as corncobs and apples. But more particularly to describe my invention I will refer to the drawings of which—

Figure No. 1 represents a transverse cut section; Fig. No. 2, a longitudinal cut section; Fig. No. 3, rear view; Fig. No. 4, front view; Fig. No. 5, bottom view; Fig. No. 6, detached view of the taper staves.

Letters A represent the frame or box inclosing the mill on four sides, and so constructed as to be set over a frame or box made to receive the ground substance which passes from the bottom part. Two of the sides together with the inclined plates B, B, form the hopper in which the material is placed to be ground.

Letter C represents a frustum of a cone put together in sections with irregular surfaces cut or cast on its periphery, and secured to the six sided shaft D which rotates in journals E formed in bosses cast on the side frame. The object of making the cone in sections is to permit of easy repair, when the grinding surfaces become worn; the smallest in diameter can be taken off, the rest shoved up to the collar and a new one put on the large end.

Concentric with the cone is a shell or concave formed of wedge shaped staves alternately adjustable and stationary the adjustable staves being represented by letters F and the stationary staves by letters G. The stationary staves are kept in place by the annular grooves H H cast or cut in the side frames and also by the projecting lugs G′ which take into openings in the side frame through which the adjustable staves protrude. The inner surface of the shell thus formed is provided with diagonal projecting surfaces the direction of the diagonal being reversed with each stave for the purpose of properly directing the travel of the material acted on. The adjustable staves pass through the annular groove and openings in the side frame and project beyond the same and in the wide end of each is a groove which takes on the flange screw nut J which works on a screw cut on the outside of the boss K in which one end of the shaft runs. By turning the flange screw nut the adjustable staves are shifted simultaneously, and the openings L are widened or contracted so as to regulate the fineness of the ground material by preventing its escape until ground sufficiently fine to pass between the staves and through the openings.

M is a set screw for the purpose of setting the cone at a proper distance from the concave surface, for the nature of the material to be ground.

The grinding surfaces or teeth are very irregular in the direction of the circumference of the cone but comparatively regular in the direction of its axis. They are arranged in groups so that the transverse section of the cone resembles in profile a ratchet or inclined tooth wheel with notches cut on the inclined part of the tooth as shown in

Fig. No. 1. When the surfaces are moving in the direction of the arrows they will grind grain but when the direction of the motion is reversed the teeth C′ will take in corncobs and apples with ease.

What I claim as my invention and desire to secure by Letters Patent of the United States is—

1. The arrangement and combination of a conical grinding surface, with a concentric shell composed of stationary and adjustable wedges or staves which are provided with a means of adjustment, substantially as herein before described and substantially for the purposes hereinbefore set forth.

2. The arrangement of the projecting surfaces C′ of the cone substantially as hereinbefore described and shown, so that by reversing the direction of the rotation of the cone small or large bodies may be crushed and ground in the mill.

GELSTON SANFORD.

Witnesses:

C. K. CORLISS,

CYRENUS PLANK.