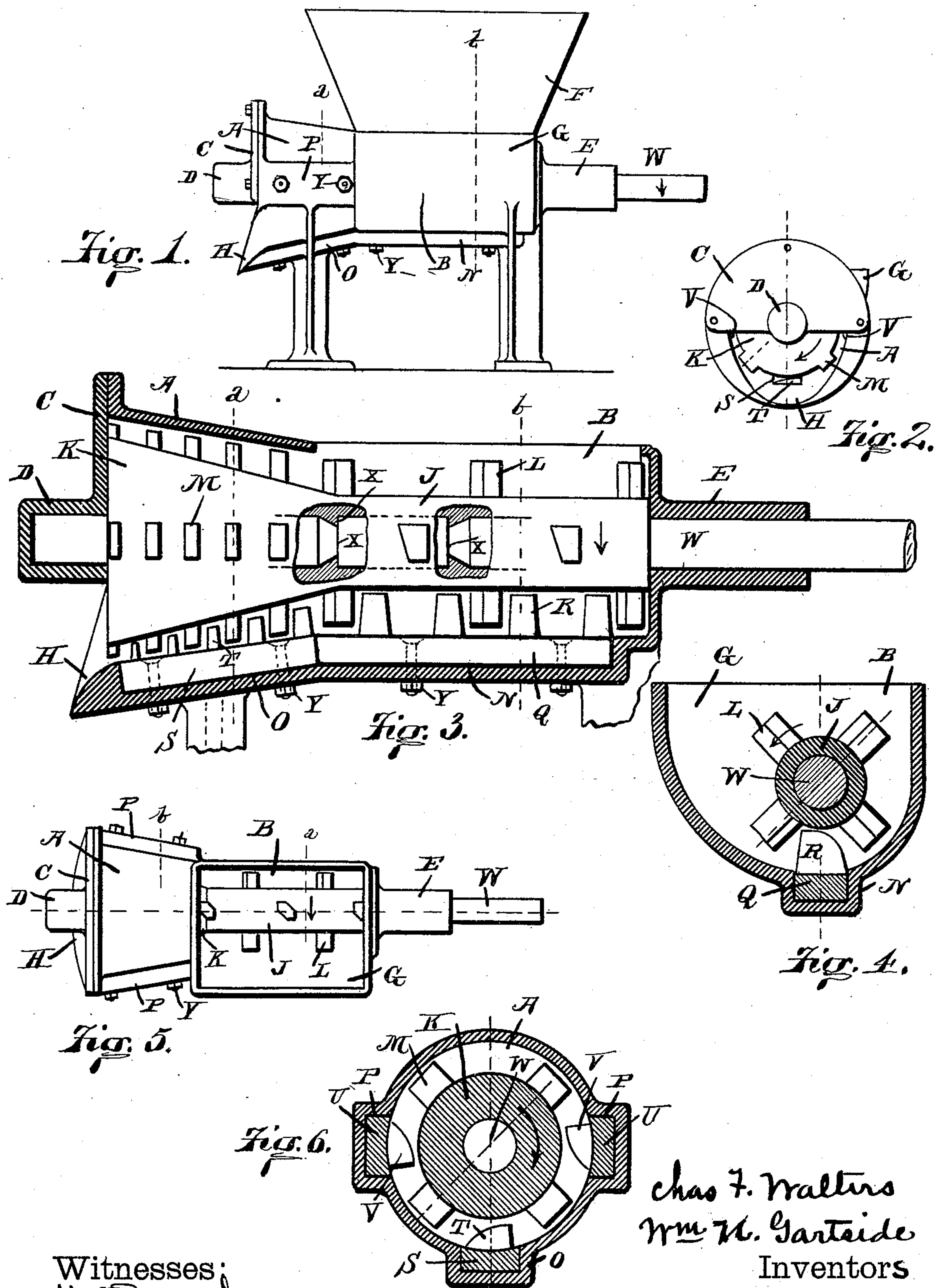


(No Model.)

C. F. WALTERS & W. N. GARTSIDE.
MILL.

No. 407,751.

Patented July 23, 1889.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES F. WALTERS AND WILLIAM N. GARTSIDE, OF RICHMOND, INDIANA,
ASSIGNORS TO THE RICHMOND CITY MILL WORKS, OF SAME PLACE.

MILL.

SPECIFICATION forming part of Letters Patent No. 407,751, dated July 23, 1889.

Application filed January 17, 1889. Serial No. 296,660. (No model.)

To all whom it may concern:

Be it known that we, CHARLES F. WALTERS and WILLIAM N. GARTSIDE, of Richmond, Wayne county, Indiana, have invented certain
5 new and useful Improvements in Mills, of which the following is a specification.

This invention pertains to improvements in mills designed for the crushing of ear-corn and corn-cobs and similar material; and the
10 improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a mill embodying our improvements; Fig. 2, an end elevation as viewed from the left of Fig. 1; Fig.
15 3, a vertical longitudinal section of the casing, the revolver appearing in elevation, with portions broken away to exhibit the shaft-grooves; Fig. 4, a vertical transverse section on line *b*,
20 looking from the left of Fig. 1; Fig. 5, a plan and Fig. 6 a vertical transverse section on line *a*, viewed from the left of Fig. 1. Figs. 1, 2, and 5 are to one scale, and Figs. 3, 4, and 6 are to double that scale. Hopper and legs are
25 ignored in all but Fig. 1.

In the drawings, A indicates a frusto-conical shell with its axis disposed horizontally; B, an open-topped trough, forming a prolongation of the small end of the shell A, the floor
30 of this trough being even with the floor of the shell, while the rear wall of the trough is tangent to the bore of the shell at its small end, that end of the trough farthest from the conical shell being closed, the shell and trough
35 being integrally formed in one casting; C, a semicircular plate secured to and closing the upper half of the large end of the conical shell; D, a bearing axially to the conical shell and formed in the plate C; E, a bearing-boss
40 and bearing formed upon the end wall of the trough and axially disposed with reference to the conical shell; F, an ordinary hopper rising upon the walls of the trough; G, an eccentric pouch-like expansion of the front of
45 the trough; H, a discharge-lip formed by a curve downward and outward prolongation of the lower part of the bore of the conical shell at its large end; J, a cylindrical revolver arranged in the trough axially to the conical
50 shell, and having a diameter very much less than the smallest diameter of the conical

shell; K, a conical prolongation of the revolver J and integrally formed with it, and located within the conical shell, the degree of coning of this prolongation being such that
55 at its large end less space is left between it and the conical shell than is left at the small end; L, rigid teeth projecting radially from the revolver J, these teeth having a length sufficient to insure free clearance at the back wall
60 and floor of the trough, these teeth being arranged in four longitudinal rows, the alternate rows having three teeth and the intermediate rows two teeth each; M, continuations of these rows of teeth upon the conical por-
65 tion of the revolver, the teeth M, however, being more closely disposed in each row, these teeth having such projection as to freely clear the inwall of the conical shell; N, a longitudinal groove or pocket formed in the floor of the
70 trough; O, a continuation of this pocket along the floor of the conical shell; P, two pockets or grooves longitudinally arranged one at the back and one at the front of the conical shell; Q, a toothed block secured in and filling the
75 pocket N; R, teeth integrally formed upon and projecting upward from the block Q to near the revolver J, these teeth being so spaced that the teeth L will pass between them; S, a toothed block secured in the pocket O; T,
80 teeth projecting upward from this block and spaced to permit the passage of the teeth M; U, blocks secured in the pocket P; V, teeth projecting inwardly from these blocks; W, the shaft of the revolver; X, two oppositely-fac-
85 ing shoulders upon this shaft, formed by turning triangular grooves in the shaft, and Y bolts by which the blocks are secured in the pockets.

The entire mill is constructed of metal. The
90 revolver, integral with its teeth, is cast upon the shaft, and during the process of casting and cooling the metal of the revolver shrinks
endwise against the shoulders X and firmly clamps the revolver to the shaft. The sides
95 of the teeth L are beveled in such direction that they act as spirals, which, when the revolver turns in the direction indicated by the arrows, will tend to urge the contents of the
trough toward the conical shell. Coarse long
100 matter, like ears of corn, placed in the hopper, fall to the trough and reach the eccen-

tric pouch G, whence the movement of the teeth L tends to lift this broken matter up along the back wall of the trough, which tendency is somewhat resisted by the gravity of the matter, the result of which is that the teeth rise faster than the broken matter rises, whereby the bevel faces of the teeth act upon the broken matter and urge it endwise toward and into the conical shell, where it is acted upon by the teeth M, passing between the teeth of the blocks and crushed into smaller pieces, whereupon it flows out at the discharge-lip H. The rear lower portion of the inner wall of the trough presents a smooth floor, smoothly prolonged by the bore of the conical shell, and the periphery of the entire revolver is smooth except in the lines of teeth, whereby the endwise movement of the material in the mill is produced with but little expenditure of power. The toothed blocks are readily removed and replaced. Removing the plate C and turning the revolver to a certain position permit the entire revolver and its shaft to be readily withdrawn endwise from the mill, thus rendering it practicable to take the entire mill to pieces in a few minutes.

We claim as our invention—

1. In a mill, the combination, substantially as set forth, of a horizontal frusto-conical shell prolonged into an open-topped eccentric trough, and provided with an axial bearing at the end of the trough and with longitudinally-arranged pockets, a removable axial bearing at the larger end of the shell, toothed blocks secured in the pockets, a shaft mounted in said bearings, and a toothed revolver secured to said shaft and having its body cylindrical in said trough and conical in said conical shell.

2. In a mill, the combination, substantially as set forth, of a frusto-conical shell prolonged into an open-topped eccentric trough and provided with teeth and bearings, a shaft journaled in said bearings and provided with two oppositely-facing shoulders, and a toothed revolver upon said shaft and engaging said shoulders.

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Witnesses:

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