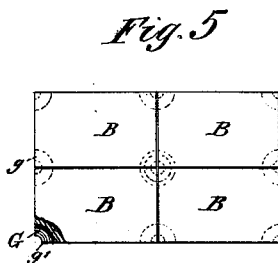
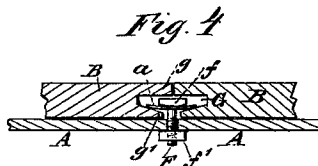
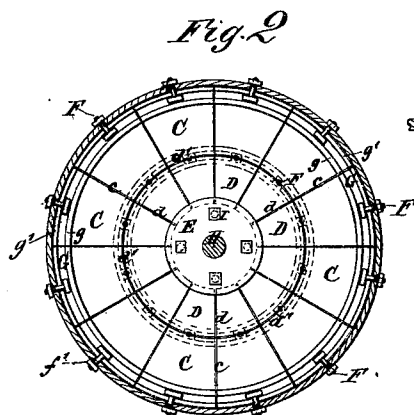
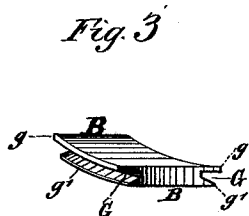
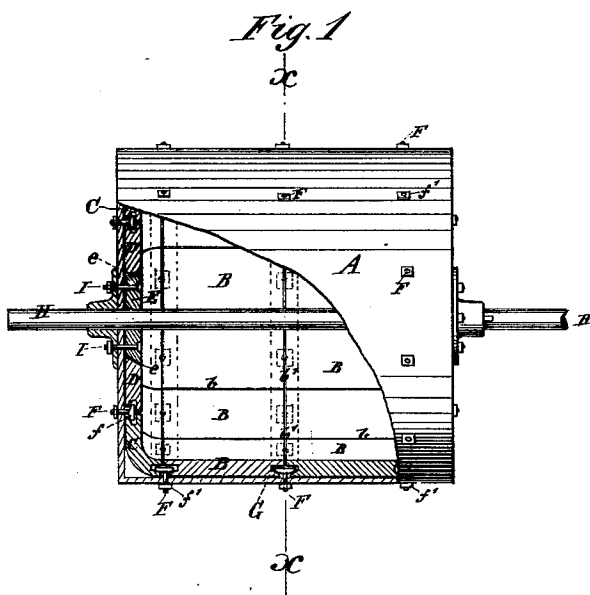


(No Model.)

J. R. ALSING.
Reducing and Triturating Cylinder.

No. 229,577.

Patented July 6, 1880.



Witnesses:

Sigfrid Lindhagen. &
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UNITED STATES PATENT OFFICE.

JOHAN R. ALSING, OF NEW YORK, N. Y.

REDUCING AND TRITURATING CYLINDER.

SPECIFICATION forming part of Letters Patent No. 229,577, dated July 6, 1880.

Application filed April 13, 1880. (No model.)

To all whom it may concern:

Be it known that I, JOHAN ROBERT ALSING, of New York, in the county of New York and State of New York, have invented a new and useful Improvement in Triturating-Cylinders, of which the following is a specification.

My invention relates to triturating-cylinders in which the lining forming the grinding-surface is composed of removable blocks or plates, the object being to provide an improved construction and device for the fastening of such plates, in order that the fastening-bolts may be protected and a hard, smooth, and durable surface may be obtained, leaving no crevices in which some of the material operated upon might lodge and escape trituration, to the destruction of uniformity in the fineness of the product.

In the accompanying drawings, Figure 1 represents a side view, partly in central section, of a triturating-cylinder constructed according to my present invention. Fig. 2 is a cross-section of the same, taken through the line *xx* of Fig. 1. Fig. 3 is a perspective view of one of the plates which form the grinding-surface. Fig. 4 is a sectional detail enlarged to show the fastening device. Fig. 5 is a plan view of a modification of the plates.

Similar letters of reference indicate corresponding parts.

A is the ordinary sheet-iron cylinder, upon whose inner surface the removable lining is secured. The present lining is intended to afford an extremely hard and durable grinding-surface for all such materials as are not impaired in quality by contact with iron, and is therefore made of chilled cast-iron plates B C D, which are cast to conform to the shape of the inner surface of the cylinder, and placed together edgewise, as shown in the drawings, (their adjoining edges being ground, if necessary,) to form close joints and an even grinding-surface without crevices.

B are the circumferential lining-plates of the cylinder A, and C D the end plates. The two opposite ends of each of the plates B C are grooved along their edges which form the cross-joints *b' c'*, (but not along the edges forming the longitudinal joints *b* and the radial joints *c d*), to receive the heads *f* of the fastening-bolts F. These are arranged in holes through

the cylinder A, at a distance apart equal to the width of a plate between its longitudinal joints or edges, in circumferential rows distanced apart to correspond with the length of a plate between its ends or cross-joints.

G designates the groove or recess in the ends of the blocks, and *g g'*, respectively, the inner and outer borders of the groove. The outer border, *g'*, is lower (measuring from the bottom of the groove G) than the inner border, *g*, by a little more than the half-diameter of the shank of the bolt F, (see Figs. 3 and 4,) so that when two plates are placed upon the inner surface of the cylinder A, as in Figs. 1 and 4, with the inner border, *g*, of one plate adjoining that of the other, there will be a space between their outer borders, *g'*, of proper width to receive the bolt-shank, which otherwise would prevent the close joining of the inner borders, *g*. The outer borders, *g'*, are beveled on the inside toward the shank of the bolt, and the under side of the bolt-head *f* is correspondingly beveled, to take better hold on the two plates at the same time when the outer nut, *f'*, of the bolt F is tightened, and to take up less room, thus allowing of making the plates thinner. To further insure contact with the two plates simultaneously and prevent any of them from rattling, I interpose (when necessary) between the bolt-head *f* and the beveled borders *g'* a spring-plate or washer, *a*, through which the bolt-shank passes, as seen in Fig. 4.

The grooves G may be molded only partially along the edge of the plate, forming a recess in the middle part thereof, or in the corners of the plates, as shown in Fig. 5. In the latter case more bolts are needed for fastening, and each bolt-head must be in contact with four plates at once to prevent rattling; but I prefer forming the grooves along the entire edge of two opposite ends, as shown in Fig. 3, in order that the plates may be slid circumferentially to adjust their positions in the cylinder A while the bolts F are in place, though not tightened, and their heads *f* in the grooves G, thus greatly facilitating and cheapening the insertion of the lining.

The corner plates, C, and end plates, D, have the same construction as the plates B, except that they are of sectoral shape to insure radial joints, and the plates C are curved, as shown

in Fig. 1, to join the horizontal plates B to the vertical plates D. In small cylinders each sector, here formed of two plates, C and D, may be made in one piece; but in either case the end of the sector nearest to the center of the cylinder or nearest to the shaft H should be beveled off, as at *e* in Fig. 1, in order that they all may be held in place together by a correspondingly-beveled circular or polygonal plate, E, made whole or in two halves, and which keeps them pressed against the end of the cylinder when bolted fast there by the end bolts and nuts, I.

The described construction and fastening device may, of course, be applied also to plates of other material than cast-iron, such as hard wood or vulcanized fiber, which latter affords a good grinding-surface for substances of medium hardness.

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

1. In a triturating-cylinder having an interior lining of removable sections, the combination, with the grooved plates B, provided with the higher inner groove-border, *g*, and lower outer beveled border, *g'*, and with the bolt F, of the metallic spring plate or washer *a*, substantially as specified.

2. In a triturating-cylinder having an interior lining of removable sections, the sectoral end plates, D, provided at their outer ends with the groove G, constructed as described, to join the contiguous plates C and B, and at their inner ends with the bevel *e*, in combination with the key-plate E and fastening-bolts F, substantially as shown and described.

JOHAN ROBERT ALSING.

Witnesses;

A. W. ALMQVIST,
SIGFRID LINDHAGEN.