

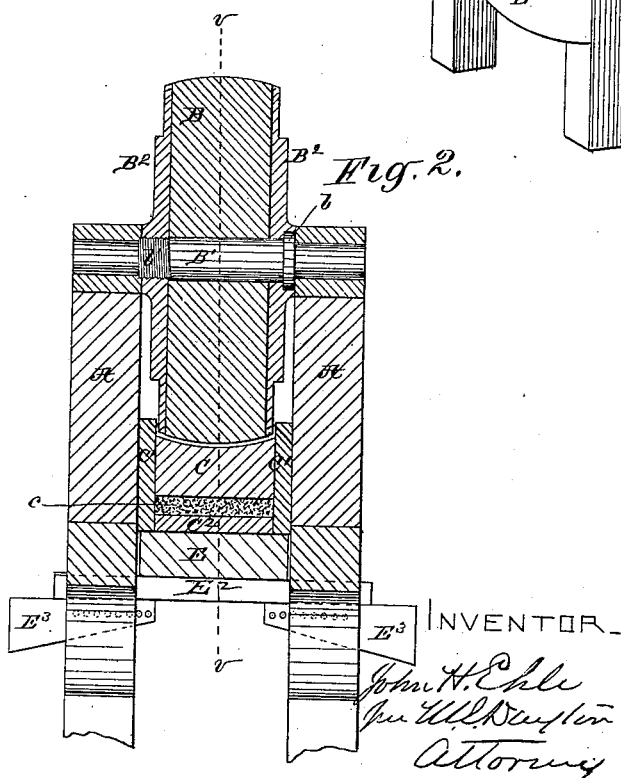
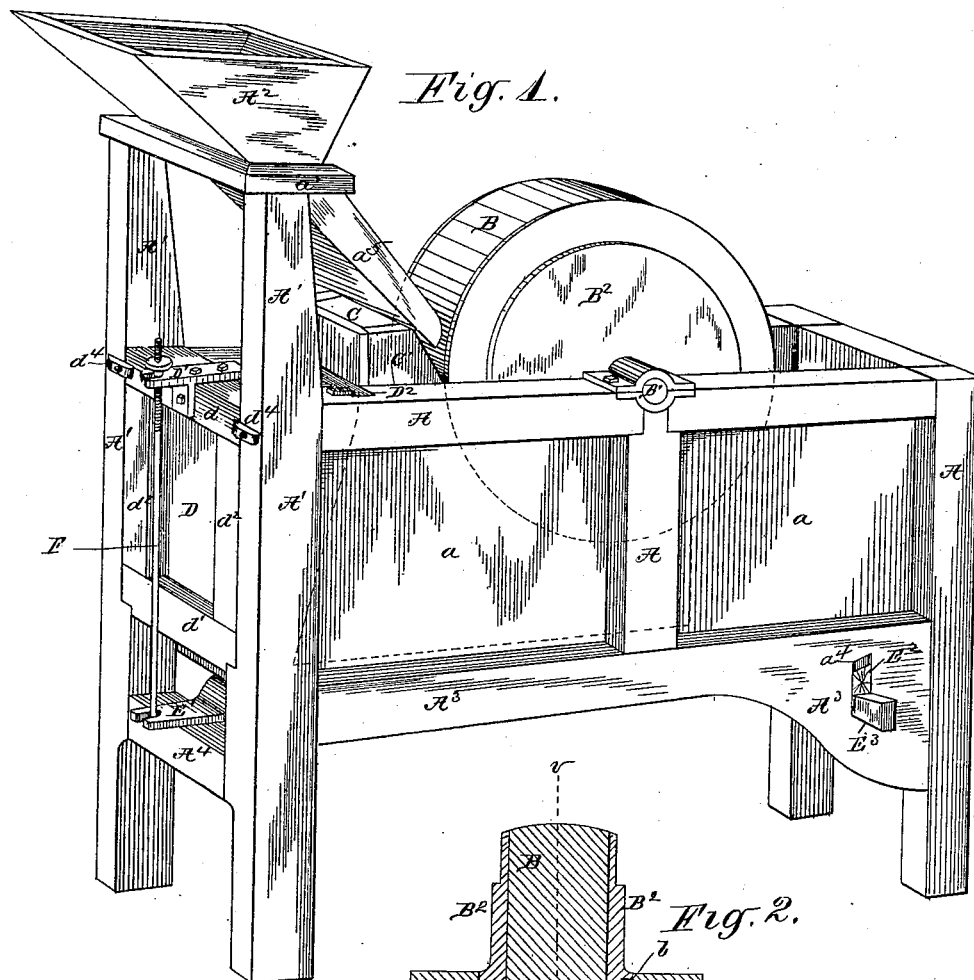
(No Model.)

2 Sheets—Sheet 1.

J. H. EHLE.
GRINDING MILL.

No. 266,116.

Patented Oct. 17, 1882.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

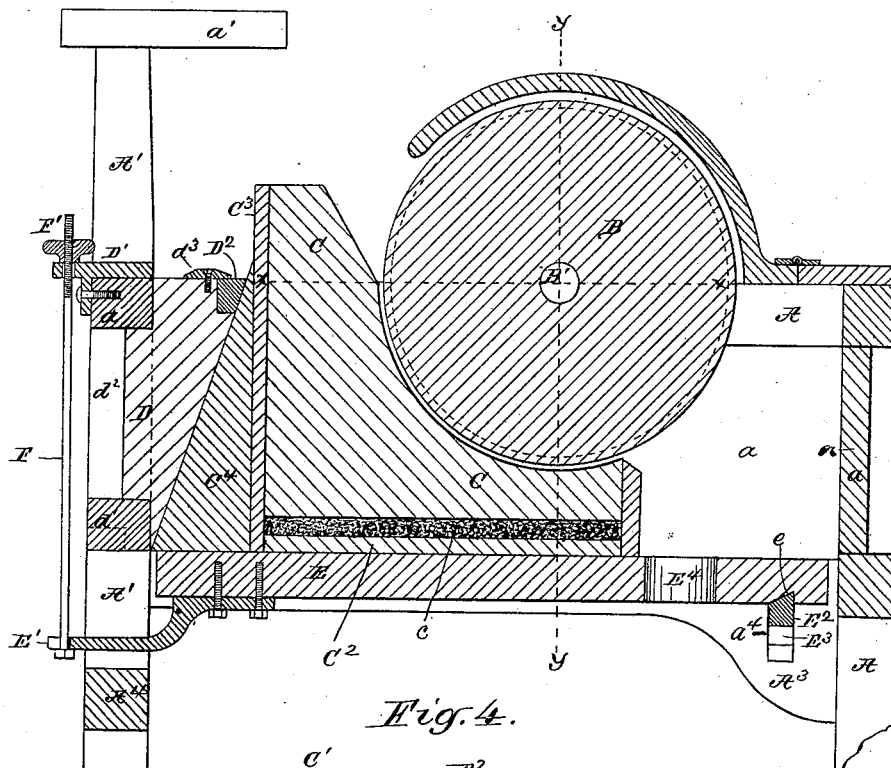


Fig. 4.

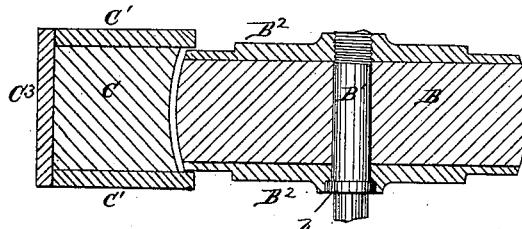


Fig. 6.

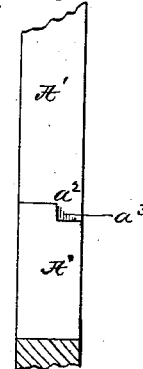


Fig. 7.

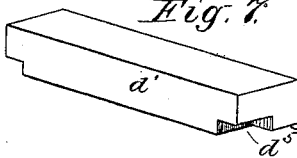
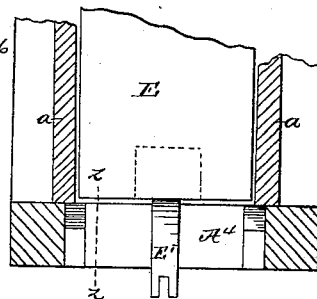


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN H. EHLE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO FRED-
ERICK A. BATTEY, OF SAME PLACE.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 266,116, dated October 17, 1882.

Application filed August 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. EHLE, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grinding-Mills; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to grinding-mills of the "cylinder and concave" class. More particularly it relates to features of construction in the side plates of the cylinder, taken in conjunction with the side plates of the concave, having for its ultimate object to insure the uniform reduction of the entire body of material that passes through the mill. It also in particular relates to devices for adjusting the concave to position, and still further to features of construction in the frame or housing and other parts whereby the concave may be conveniently removed from the housing without disturbing the cylinder in its bearings.

The special matters in which the invention consists are hereinafter fully set forth, and pointed out in the claims.

In the drawings, Figure 1 is a perspective view of a grinding-mill containing my improvements. Fig. 2 is a vertical section through the axis of the cylinder, or through *yy* of Fig. 3. Fig. 3 is a central vertical section transverse to the axis of the cylinder, or in the line *vv* of Fig. 2. Fig. 4 is a partial horizontal section through *xx* of Fig. 3. Fig. 5 is a fragmentary horizontal section of the housing and frame, taken anywhere above the bridge-tree, the superposed parts being removed. Fig. 6 is a fragmentary elevation of one of the uprights *A'* detached. Fig. 7 is a perspective view of the lower cross-bar belonging to the removable end piece of the housing, showing the form of the ends of said cross-bar by which it is adapted to engage with the shoulders of the rear uprights of the frame.

A A' A³ A⁴ is the frame, and *aa* are panels at the sides and one end, forming three parts of the housing for the working parts.

B is the cylinder, mounted on a shaft, *B'*, which rests in bearings upon the upper hori-

zontal frame-piece, *A*, and *B²* are metal disks between which the stone *B* is confined.

C is the concave stone. *C'* are the side boards of the box in which the said concave is contained. *C²* is the bottom board of said box; *C³*, its rear end board; and *c* may represent the cement by which the stone is bedded or secured in the box.

E is the bridge-tree upon which the concave rests.

E' is an arm projecting from the bridge-tree at the rear end of the machine, to afford attachment for the tram-rod *F*, and *E²* is a cross-bar and *E³* are wedges by which the front end of the bridge-tree is supported.

D is the rear end piece of the housing, having attached thereto the frame-pieces *d*, *d'*, and *d²*. The lower one of these frame-pieces rests on and behind shoulders cut in the uprights *A'*, and its upper end is held in place by inward bearing against a removable cross-piece, *D²*, and by buttons *d⁴*. (Seen in Fig. 1.) The end piece, *D*, thus held in place, in turn supports the rear end of the bridge-tree by means of the projecting metal piece *D'*, affording attachment for the upper end of the adjustable tram-rod *F*.

The cylinder *B* is secured on the shaft *B'* by the following means, to wit: The shaft *B'* is provided with a fixed collar, *b*, against which rests the contiguous clamping plate or disk *B²*, preferably recessed to admit the same. On the opposite side of the stone *B* the shaft *B'* is screw-threaded at *b'*, and the second disk, *B²*, is correspondingly threaded and run up against the stone by being rotated as a nut; or a separate nut may be employed exterior to this disk. Nothing novel is claimed in this mode of securing the cylinder to its shaft.

For the purpose of protecting the exterior edges of the cylinder from fracture or chipping, which is common in this class of mills as heretofore constructed, the disks *B²* are extended to the full diameter of the several circular faces of the cylinder, as shown in the several figures of the drawings; but as these disks require to be reduced in diameter as the stone wears away the edges of said disks are made materially thinner than would serve for their central portions, so as to be readily and cheaply

turned off, and also for the purpose of affording room for the extended lateral walls of the concave. Said walls C' of the concave are preferably of wood, and rise above the concave face a short distance—say three-eighths or half an inch, or thereabout—in proximity to and embracing the margins of the disks B^2 . By this means the grain being ground is prevented from lateral escape from between the grinding-faces in its passage through the mill.

The lateral walls of the concave elevated to embrace the sides of the cylinder for a short distance to prevent the escape of the material being ground is a feature of construction not in itself new; but the combination, with such extended concave walls, of the cylinder having its end disks, B^2 , extended to the exterior edges of the cylinder and embraced by said walls is claimed as a part of my invention. The ultimate object of thus protecting the edges of the cylinder from fracture is identical with that of the projection of the side walls, C' , of the concave above the face of the stone—namely, to prevent the passage through the mill of material unground or only partly ground—for it is obvious that when the edges of the cylinder are broken away space is afforded in which grain may lodge and escape reduction, even if the concave walls be extended, as shown. The extended cylinder-disks B^2 therefore co-operate with the extended concave walls to insure the effect desired.

In this class of grinding-mills as heretofore constructed the concave, when removed from the housing, is lifted out vertically. This usually necessitates first removing the cylinder, and in any case is laborious, inconvenient, and for other reasons objectionable. In order to obviate the necessity for thus lifting the concave the end piece, D , of the housing is made removable from the frame, so as to open a passage through which the concave may be drawn out between the rear uprights, A' , of the mill. When the front end of the concave rises above the lowest point of the cylinder, as shown in the drawings, and as is commonly and preferably the case in this class of mills, the bridge-tree E is also adapted to be sufficiently lowered to allow the front end of the concave to escape the cylinder. As here constructed the panel or end piece, D , is provided with the lower cross-bar, d' , (seen detached in Fig. 7,) having a notch, d^5 . The rear uprights, A' , are reduced in thickness laterally from the point a^2 , Fig. 6, upward, and the shoulder at a^2 is made to conform with the under notched face of the cross-bar d' ; or, in other words, the projection d^5 on each end of the cross-bar sets in the notch a^3 of the adjacent upright A' . At its upper end the end piece, D , rests against the removable cross-bar D^2 , and is held from falling outwardly by the buttons d^4 , Fig. 1. The cross-bar D^2 rests in notches cut in the upper faces of the horizontal frame-pieces A .

The tram-rod F engages removably and in the usual manner with the arm E' , attached to and rearwardly projecting from the bridge-

tree below the end piece, D , and is also engaged with the projecting metal plate D' , attached to said end piece, as shown, at its upper extremity, where it is provided with the screw-threaded hand-wheel F' , of familiar construction. When it is desired to remove the concave the tram-rod is disconnected, which allows the arm E' to fall upon the permanent cross-beam A^4 of the frame, and the end piece, D , and the cross-bar D^2 are removed. The rear end of the housing being thus opened, the concave is slid out upon the bridge-tree between the uprights A' , and it is returned to its place by the same passage.

As a means of thrusting the concave forward at the same time that it is lifted by the tram-rod F , the concave is provided with a wedge-shaped piece, C^4 , having its thicker part at the bottom. This wedge-piece bears against the cross-bar D^2 or against the removable back piece, D , having its inner or front face projected forward from bottom to top, so as to bear more or less fairly against the inclined face of the wedge C^4 , as shown in Fig. 3. When the bridge-tree and concave are raised by means of the tram-rod F , therefore, the concave is made to slide forward on the bridge-tree and adjusts itself uniformly to the face of the cylinder. The wedge-shaped block C^4 may be permanently secured to the box of the concave, thus forming an outwardly and downwardly inclined rear wall of said box or concave; or said block may be loose or detached, in which case, however, when in place it obviously has the same effect as when permanently fastened to the back of the concave.

The bridge-tree is transversely grooved to receive the upper beveled edge of the supporting cross-bar E^2 , and is thus held from rearward motion or displacement. The height of the front end of the bridge-tree is made variable by means of wedges E^3 , inserted beneath the cross-bar E^2 in the vertical slots a^4 , cut through the lower horizontal frame-piece, A^3 , for their reception.

The remaining parts of the machine present nothing claimed to be new. The hopper A^2 is mounted in the usual manner in the rectangular frame a' , supported by the uprights A' , and a spout, a^5 , conducts the grain to the grinding-surfaces. A passage, E^4 , through the bridge-tree (or at its end) gives outlet to the ground product, and a suitable spout (not shown) may be attached to the frame to conduct it in either direction. The cylinder is rotated by a belt-pulley on the shaft B' . (Not shown in the drawings.)

I claim as my invention—

1. The combination, with the concave C , and with its lateral walls C' extended above the working-face of the stone, of the cylinder B , and its circular metal end plates, B^2 , extended to the margin of the cylinder, so as to be embraced by the projecting walls of the concave, substantially as described, and for the purposes set forth.

2. In a cylinder and concave grinding-mill,

the combination, with a removable concave, of a removable rear end piece of the housing, whereby the concave may be passed out or in at the end of the machine, substantially as described.

5 3. In a cylinder and concave grinding-mill, the combination of the cylinder B, the removable concave C, rising at its front end above the lowest point of the cylinder, a bridge-tree, E,
10 adapted to be lowered so that the concave may clear the cylinder when drawn out rearwardly, and a removable end piece, D, of the housing, substantially as and for the purposes set forth.

4. In a cylinder and concave grinding-mill,

the combination of the cylinder B, bridge-tree 15 E, tram-rod F, concave C, provided with a downwardly and outwardly inclined rear wall, and a stationary part of the frame, as D, whereby when the bridge-tree is lifted the concave is both raised and thrust forward, substan- 20 tially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

JOHN H. EHLE.

Witnesses:

M. E. DAYTON,

JESSE COX, Jr.