

(No Model.)

E. TOTMAN.
Metallic Burr or Grinding Ring.

No. 239,073.

Patented March 22, 1881.

Fig 1.

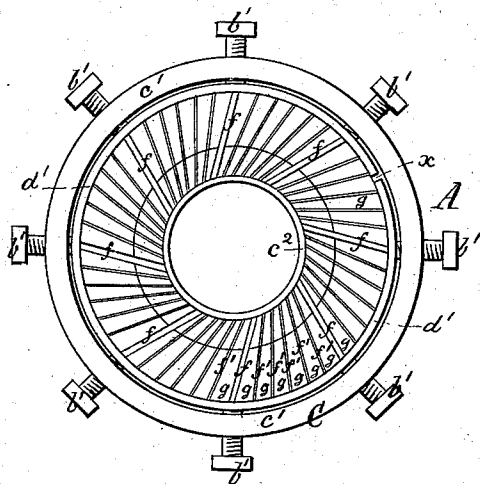


Fig 2.

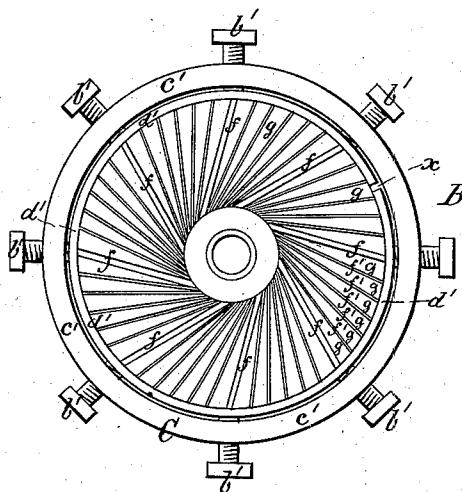


Fig 3.

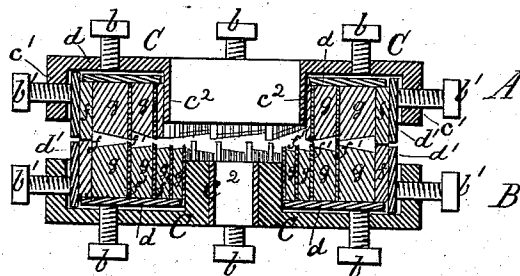


Fig 4.

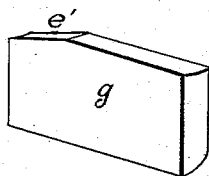


Fig 6.

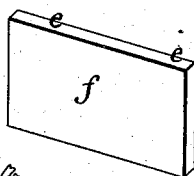
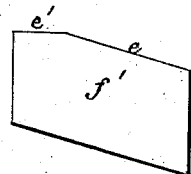


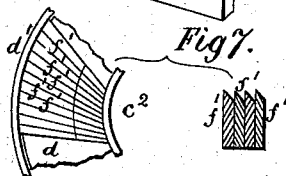
Fig 5.



Witnesses:

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Russell Bart

Fig 7.



Inventor:

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by
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UNITED STATES PATENT OFFICE.

EDSELL TOTMAN, OF BATAVIA, ILLINOIS.

METALLIC BURR OR GRINDING-RING.

SPECIFICATION forming part of Letters Patent No. 239,073, dated March 22, 1881.

Application filed June 8, 1880. (No model.)

To all whom it may concern:

Be it known that I, EDSSELL TOTMAN, a citizen of the United States, residing at Batavia, in the county of Kane and State of Illinois, have invented a new and useful Improvement in Grinding-Rings or Metallic Burrs for Grinding Grain and other Substances; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and letters of reference marked thereon, forming a part of this specification of said invention, in which drawings—

Figure 1 is a plan view of the working-face of the upper grinding-ring, the same showing a proper central circular opening through which the grain to be ground or other substance is fed; and Fig. 2 is a like view of the lower grinding-ring except its central aperture. Fig. 3 is a vertical central section of the two grinding-rings when placed in juxtaposition for the practical operation of converting wheat into flour or for grinding other grain or substance. Fig. 4 is a view of a "filling" portion of the grinding-rings, which filling portion is interposed between the grinding-teeth of the grinding-rings. Fig. 5 shows a grinding-tooth having a sloping portion which is near the eye of the grinding-ring, and Fig. 6 a grinding-tooth having its working-face horizontal or on a uniform plane from end to end. Fig. 7 is a grinding-face formed entirely of cutting-edged plates.

My invention relates to a grinding-mill which employs cylindrical grinders or burrs running face to face, arranged either horizontally or vertically; and the objects of my invention are, first, to provide metallic edged blades or grinding-teeth together with interposed filling-pieces of either wood or iron, all shaped, dressed, and arranged in such a manner that furrowed metallic grinding-faces corresponding to the grinding-faces of ordinary furrowed millstones are secured; second, to provide for adjusting the metallic edged blades or grinding-teeth and filling-pieces, and by their adjustment compensate for the wearing away of the working-faces of the grinding-teeth; third, to provide for rendering a portion of the grinding blades or teeth self-sharpening by making them reversible end for end; and, fourth, to

provide a means for clamping the grinding-blades and filling portions forming the working-faces of the grinding-rings within metal caps, whereby they can be readily set in the caps or removed therefrom, as occasion may require, as well as adjusted.

The advantages of my improvements are great, since in ordinary burr-millstones as furrowed and dressed, if one portion of the working-face wears away, the whole surface or working-face is useless until the whole is re-dressed, whereas with my invention it is only necessary to remove a worn or defective grinding tooth or blade and substitute a new one, or else regrind the worn or defective tooth and then reset it in proper grinding relation.

The advantage of my improvement is further seen as compared with a cast burr, since the latter becomes entirely useless when its working-face wears away a certain distance. Besides this it is impossible to cast a solid burr or grinding-ring with accuracy, since it will either "spring" in the casting or in molding, and in consequence will not grind even, whereas by my invention the adjustable grinding-teeth can be made perfect, since the metal cap which holds them is turned true in a lathe, and then the teeth set in place therein, and all faced perfect in the lathe, the result being that grinding-rings so made will grind as fine and evenly as any burr-millstone.

The French burr-millstone, as furnished by manufacturers, almost always is lacking in weight, as well as out of balance, so far as the upper or "runner" stone is concerned. Hence the runner must be "backed" as well as "balanced" before perfect grinding can be done with this class of millstones. By my invention, however, any amount of metal required to impart weight may be used in constructing the ring or shell in which the grinding-teeth and filling-pieces are set; and as every part composing one of my grinding-rings may be made of metal and entire accuracy as to size and weight secured, such rings may be delivered to the miller in perfect condition for immediate use by the manufacturer.

In the drawings, A indicates the upper grinding-ring, and B the bed-ring, and in general construction and "dress" they are alike. Their outer portions consist of a cast-metal

cap or shell, C, of circular form, with an outer rim, c' , and with a central annular portion, c^2 , which in the upper grinding-ring is the eye into which the grain or other substance to be ground is fed from the hopper. This cap is made of cast-iron, and is cast in one piece, and of any desired weight of metal. After having been cast, it is then placed in a lathe and both inside and outside turned down with exact uniformity, care being taken to have the inner face of the cap level. The cap is then pierced with screw-bolt holes to receive the screw-bolts, as shown in the figures, and is now ready to be supplied with its interior furnishing.

In the figures, d indicates a circular metal plate having its central portion cut out, so that the plate may be passed over the annular portion c^2 and rest upon the inner level face of the cap, as shown, the width of this plate being a little less than the distance between the parts c' and c^2 , and so as to admit of a split or parted ring, d' , to be placed within the cap, as in Figs. 1, 2, and 3.

The dress of the grinding-ring is made up of grinding-teeth f and f' and either soft-metal or wood filling-pieces g , the same being arranged to rest edgewise upon the circular plate d and extend from the inner surface of the split ring d' to the annular portion c^2 of the cap or shell C, the whole being arranged together in respective relation, as signified clearly in Figs. 1 and 2. The grinding-teeth f and f' are made of hardened cast-steel, while the filling-pieces g may be made either of soft metal, such as iron, or of wood. The teeth f are of rectangular form, as seen in Fig. 6, their upper edges, as at e , from end to end, constituting their grinding-surfaces, which are level throughout, and which extend from the rim or annular portion c^2 to the split ring d' . The teeth f' are in general form rectangular, and like teeth f , but much thinner, and are made of plate metal, the same being hardened cast-steel, as above stated. The working or grinding edges e of the teeth f' may be made sharpened, as signified in Fig. 5, or they may be plane-surfaced, the same as teeth f . The teeth f' are at their inner ends made sloping, as at e' , and thus, in connection with the filling-pieces g , form a proper passage for the substance being ground to pass outward toward the perimeter of the grinding-ring from the eye of said ring.

In practice the teeth f may be made from two to two and a half or even three inches in width, and have a grinding-face, as at e , of a width equal to their thickness; and when, by rotation of the runner grinding-ring, they become worn away so as to form a sloping grinding-face, they may be reversed in position end for end, and thus present the sharp edge of the sloping face for action upon the grain or other substance being ground, and in this manner the grinding-teeth f become self-sharpening. The filling-pieces g (made either of wood or soft metal) are also sloped off, as at e' ,

to correspond with the like slope on the teeth f' . They are made longitudinally of wedge form, as clearly indicated in Figs. 1 and 2, and are located between the teeth f' and between the teeth f and f' , as shown; and when the interior furnishing of the cap C is first made up the top surface of these filling-pieces is made a proper distance below the grinding-surface or top edges of the teeth f and f' , in order to form the necessary feeding-drifts for the grain to pass from the eye of the grinding-ring along toward its perimeter, as well as to the grinding-surfaces or grinding-edges of the teeth. Being made of soft metal or of wood, these filling-pieces are readily cut or filed away, as the case may be, when the grinding surfaces or edges of the teeth wear away so as to require the "feeding-drifts" to be deepened.

Having placed the ring-plate d in position, and also the split ring d' , with the teeth and filling-pieces, as shown in Figs. 1 and 2, screw-bolts, as at b b b , equally spaced apart, are now inserted through the screw-holes in the body portion of the cap C, and so as to impinge against the ring-plate d , while at the same time like bolts, as at b' , are passed through the screw-holes in the rim c' , so that the inner ends of the bolts will impinge against the split ring d' , as clearly indicated in Fig. 3. It will thus be seen that by screwing up the bolts b against the ring-plate d the teeth f and f' and filling-pieces g may be adjusted outwardly from the cap C as the grinding-faces of these teeth wear away, while also said teeth and filling-pieces may be held in any desired position to which the same may have been adjusted. The split or separated ring d' (split or separated as at x) allows said ring to be forced up against the outer ends of the teeth and filling-pieces, and so hold them firmly in position when required, and by simply unscrewing the bolts b' the teeth f and f' can readily be removed for repair, or for the substitution of new teeth in their places, or for the purpose of turning or reversing the teeth f , end for end, and so render them self-sharpening.

Instead of providing intermediate filling-pieces, g , the whole grinding-surface may be formed of teeth having a beveled cut upon their edges, so as to form feeding-drifts, as indicated in Fig. 7.

What I claim is—

1. A grinding burr or ring for mills, comprising in its construction a disk having an inner and outer flange, a grinding-surface formed of separate blades or teeth which are movable together or separately independently of the disk, mechanism for adjusting the blades, and mechanism for confining them in position when adjusted, and for releasing them in order to allow for their adjustment, said confining and releasing mechanism also serving, when desirable, for holding a major portion of the blades or teeth in position or together while a new blade is being inserted, substantially as described.

2. A grinding burr or ring for mills, comprising in its construction a disk having an inner and outer flange, a grinding - surface formed of grinding plates or teeth and filling-
5 pieces, the plates and filling-pieces being adjustable independently of the disk, mechanism for confining the plates and filling-pieces, and mechanism for adjusting the plates and filling-pieces together, substantially as described.
10 3. The grinding rings or burrs of a mill, comprising in their construction a disk, separate movable blades which are reversible, means for confining the reversible blades, and means for adjusting the blades as they wear

down independently of the disk, substantially 15 as described.

4. The combination of the supporting and binding rind, separate grinding plates or teeth, a split ring and adjusting plate, and screws for operating the split ring and adjusting- 20 plate, substantially as and for the purpose described.

Signed in presence of two subscribing witnesses.

EDSELL TOTMAN.

Witnesses:

CHARLES C. STEPHENS,
E. S. SMITH.