

(No Model.)

O. E. HALIN.
METALLIC MILL BUR.

No. 583,532.

Patented June 1, 1897.

Fig. 1.

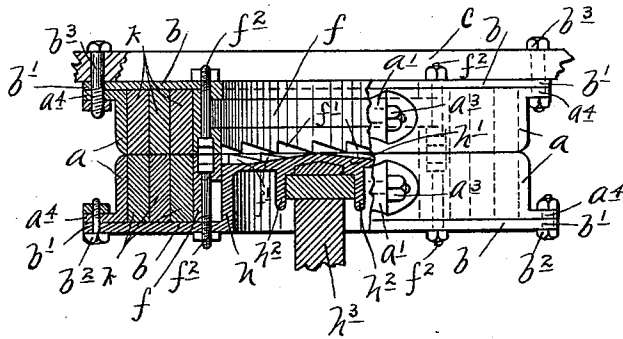


Fig. 2.

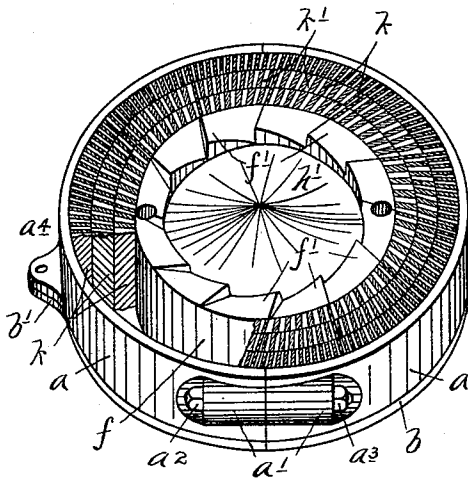
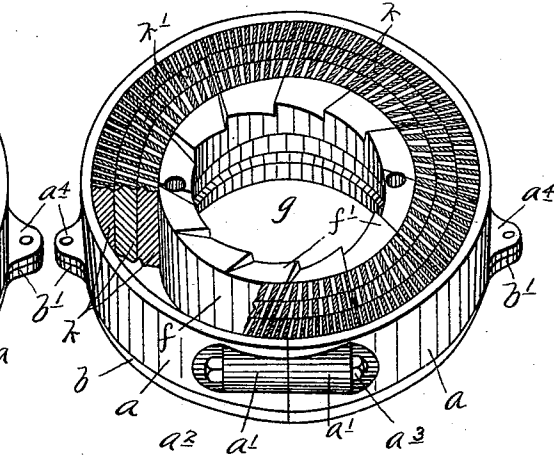


Fig. 3.



Witnesses.

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METALLIC MILL-BUR.

SPECIFICATION forming part of Letters Patent No. 583,532, dated June 1, 1897.

Application filed July 6, 1896. Serial No. 598,118. (No model.)

To all whom it may concern:

Be it known that I, OLE E. HALIN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Metallic Mill-Burs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an improvement in metallic mill-burs adapted as a substitute for the ordinary mill or bur stones.

To this end my invention comprises the novel devices and combinations of devices hereinafter described, and defined in the claims.

The preferred form of my invention is illustrated in the accompanying drawings, wherein, like letters referring to like parts throughout the several views—

Figure 1 is a view, partly in front elevation and partly in vertical section, showing a pair of mill-burs constructed in accordance with my invention and placed in working position. Figs. 2 and 3 are perspective views looking at the working faces, respectively, of the lower and upper members of the cooperating burs shown in Fig. 1, some parts being broken away and others removed.

As shown, the skirt or peripheral retaining-bands of the burs are formed by half-cylinders *a*, which at their adjoining edges are provided with perforated bolt-lugs *a'*, through which bolts *a²* are passed, which bolts are provided with nuts *a³*, by means of which the skirt-band sections are drawn together.

Annular bottom plates *b* are provided for cooperation with each of the skirt-bands *a a*. Attention is here called to the fact that the word "bottom" as here used denotes the portions of the bur or skirt bands *a a* which are the farthest from the working faces of said burs, but not necessarily the lowest portion of the same. The bottoms of the skirt-sections *a* are provided with perforated lugs *a⁴* and the annular bottom plates *b* are provided with cooperating perforated lugs or ears *b'*.

The lugs *a⁴* and *b'* of the lower member of the burs are secured together by means of nutted bolts *b³*, which are passed through the

same. The lugs *a⁴* and *b'* of the upper or inverted member of the burs are secured together by means of nutted bolts *b³*, which, as shown, pass through the same and also through an overhead support or cross-beam *c*, from which the said uppermost bur is rigidly supported.

Supported from the bottom plates *b*, but spaced apart a considerable distance inward from the skirt-bands *a a*, are annular metallic rings *f*. These rings *f* are provided with coarse teeth or serrations *f'*. As shown, the rings *f* are secured to their respective plates *b* by means of nutted bolts *f²*, the heads of which are countersunk or set below the teeth *f'*.

As already indicated, the central portion of the upper member of the burs is left open to form an eye *g*, through which the grain or other material may be fed to the operating-faces of the burs.

The inner edge of the bottom plate *b* of the lower member of the burs is formed with an annular upturned flange *h*, which, as shown, fits into the interior of the cooperating ring *f*. As shown, the opening which would otherwise be left through this annular flange *h* is closed by a conical bosom-plate *h'*, cast integral therewith and formed at its under central portion with a seat *h²*, in which the upper end of the supporting and motion-imparting shaft or standard *h³* is rigidly secured. It will thus be seen that the upper member of the burs is fixed, while the lower member is the runner or rotary member. The lower or running member, as already indicated, is illustrated in Fig. 2, while the upper or fixed member is illustrated in Fig. 3.

The grinding-faces of the burs are each made up of alternate layers of some very hard substance and a relatively very soft substance. As shown, these alternate layers are arranged in three concentric rows or series, which are tightly compressed together and between the outer surfaces of the rings *f* and the inner surfaces of the cooperating skirt or band sections *a a*. As shown in the drawings, *k* indicates the relatively hard layers, which are formed of tempered steel, and *k'* indicates the relatively soft layers, formed by strips of paper board or similar substance. It will be noted that the alternate layers which make up the three series or rows are thickest in the inner

row and thinnest in the outer row. This of course will tend to gradually reduce the stock as it is fed toward the peripheries of the burs. It will also be noted that the sections or layers k' of the several rows or series are so arranged as to form lead furrows running from the points of the teeth f' outward and that all of the sections are arranged on a line which runs tangent to a circle struck from the center of the bur. This construction causes the stock or grain being ground to travel outward toward the periphery of the bur.

It will be understood, of course, that in the grinding action of the burs the filling pieces k' will wear away much more rapidly than the hardened sections k , and hence that furrows will always be formed between said hardened sections k . This of course will leave the hard sections protruding, so that they will have the proper grinding action on the stock. Under the grinding action as the sections wear away the filling sections will always be kept worn back of the hardened sections, and hence the device is self-sharpening.

This latter feature is of course a great advantage over the ordinary mill or bur stones, both on account of the great saving in labor required to keep these stones sharpened and also because the working action of the burs is not interrupted. When the hard sections k have been worn down so far that they cannot be longer used without adjustment, this adjustment may be accomplished and the said sections forced outward beyond the skirt or bands a by placing a layer of suitable packing material between the inner ends of the same and the inner face of the cooperating bottom plate b .

It will be understood, of course, that vari-

ous alterations in the details of construction of the preferred form of my device above described may be made without departing from the broad principles of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. A mill-bur, the grinding-face of which is made up of alternate layers of relatively hard and relatively soft materials, arranged in several concentric rows, the layers of which rows are successively thinner outward from the center of the bur.

2. In a metallic mill-bur, the combination with the two-part skirt-band a , a , and means for drawing the sections thereof together, of the bottom plate b removably secured thereto, the serrated metallic ring f , secured to said bottom plate b , and the concentric rows of alternately-arranged hard and soft layers k , k' compressed between said ring f and sections a , a , substantially as described.

3. In a metallic mill-bur, the combination with the two-part skirt-band sections a , a provided with bolt-lugs a' clamped together by means of nutted bolts a^2 , a^3 , of the bottom plate b removably secured thereto, the serrated metallic ring f , secured to said bottom plate b , and the concentric rows of alternately-arranged hard and soft layers k , k' compressed between said ring f and sections a , a , the layers of the outer rows being thinnest, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

OLE E. HALIN.

Witnesses:

BESSIE B. NELSON,
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