E. S. BLAKE.

ROLLS FOR PULVERIZING-MILLS.

No. 189,887. Patented April 24, 1877.

Fig. 1.

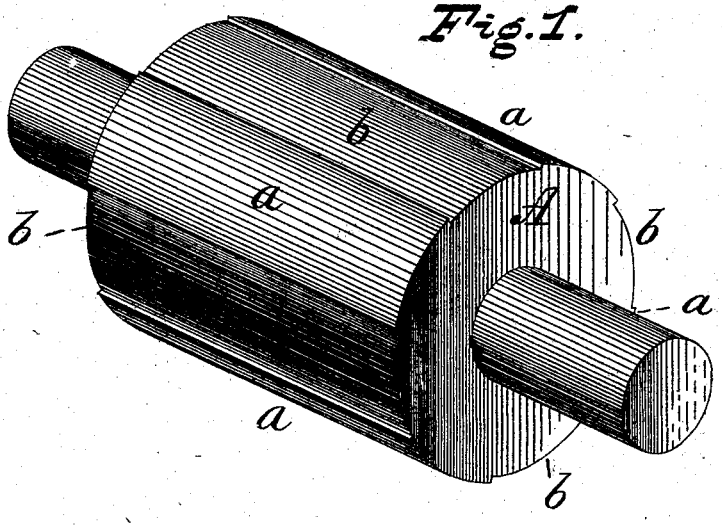


Fig. 2.

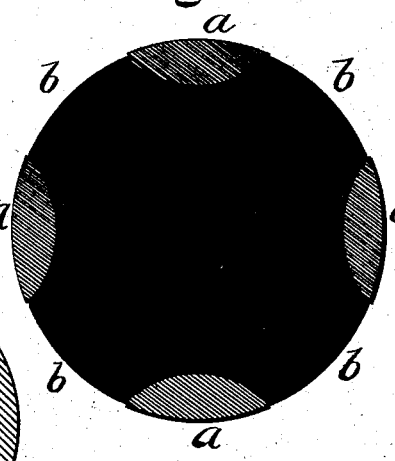


Fig. 3.

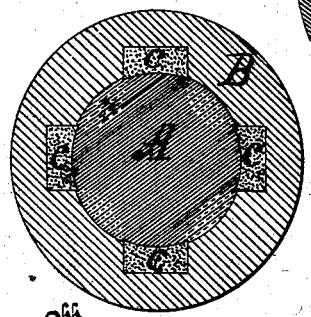
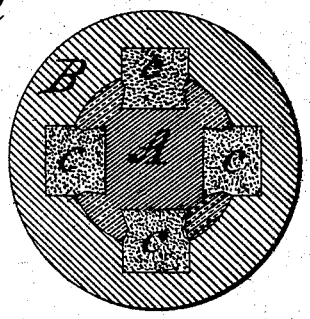


Fig. 4.



Witnesses

Henry H. Blake

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UNITED STATES PATENT OFFICE.

EDWARD S. BLAKE, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN ROLLS FOR PULVERIZING-MILLS.

Specification forming part of Letters Patent No. **189,887**, dated April 24, 1877; application filed January 4, 1877.

To all whom it may concern:

Be it known that I, EDWARD S. BLAKE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Rolls for Pulverizing-Mills; and 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a perspective of the roll. Fig. 2 is a transverse section of the same. Figs. 3 and 4 are sections in detail, showing mode of production.

This invention relates to improvements in the construction of pulverizer-rolls; and consists in so constructing the roll that its convex surface shall be made up in longitudinal strips of hard and soft metal alternately, the object thereof being not only to secure, but also to maintain, slight depressions in the surface lengthwise, at such suitable and regular intervals, circumferentially, as will facilitate and expedite the passage between the rolls of the material to be pulverized, and at the same time to obviate the injurious effect of deep corrugations, which is to allow a portion of the material to pass without pulverization.

In crushing and pulverizing rolls of the longitudinally-corrugated form (for securing the more ready passage of the material) the depressed parts of the corrugations are, of course, chilled to almost the same degree of hardness as the elevated parts, the chill entirely surrounding the roll, and the difference in hardness being objectless, and due solely to the fact that the elevated parts are nearly surrounded by, and more exposed to, the effect of the chill than the depressed parts. Consequently, inasmuch as the tendency is for the elevated portions to wear much more rapidly than the depressed parts, the corrugations soon disappear, and with them the working capacity of the roll. These evil effects I wish to guard against, and to that end my invention is as follows:

In the drawings, A designates the roll of a pulverizing-machine, having the longitudinal portions or strips *a* chilled, and the intervening strips *b* of soft metal—*i. e.*, cast in sand, as usual.

The strips *b* may be depressions formed in casting; or the roll may be cast a perfect cylinder, and the desired depressions left to be formed by the wear of such soft portions.

I obtain this alternation of hard and soft metal in the following manner: The roll is cast in a chill, B, a hollow cylinder of iron, (shown sectionally in reduced size by Fig. 3,) which has in its interior surface several longitudinal grooves or recesses, into which, before casting, I insert cores of sand *c*, which may either be flush with the surface or project slightly, to form a groove or depression in the roll.

In casting, that part of the roll contacting with the sand will remain unchilled, and will constitute the comparatively soft portions or strips *b*.

It is obvious that the sand cores *c* may be made to extend inwardly so far as to form in the roll grooves or recesses suitable for the reception and retention of bars of wrought iron or steel, or other comparatively soft metal, to take the place of soft cast-iron. This construction is shown in section by Fig. 4; or the alternation might be effected by having the one set of surfaces *a* of hardened steel, and the intervening strips *b* of soft steel or other metal.

The effect of either of the above-described methods of construction is, that the strips *a*, which are most exposed to wear, are harder than surfaces *b*, which are less exposed, and the consequence is, that the strips *a* wear away more slowly than the strips *b*; or, regarding their relative exposure, the actual wear on both sets of surfaces is about equal, thus preserving the desired form in the roll, and prolonging its life.

The construction is applicable to a solid roll or other styles, such as a separable shaft and cylinder, or a roll cast or built up in sections.

Having thus fully described my invention, I claim—

A pulverizing-roll having its convex surface formed in alternate strips of chilled and unchilled iron, said strips running in the direction of the axis of the roll, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 21st day of December, 1876.

EDW. S. BLAKE.

Witnesses:
HENRY H. BLAKE,
GEO. F. RUDISILL.