(No Model.)

H. BIRKHOLZ.

APPARATUS FOR CASTING CHILL RINGS.

No. 404,888. Patented June 11, 1889.

Fig. 1.

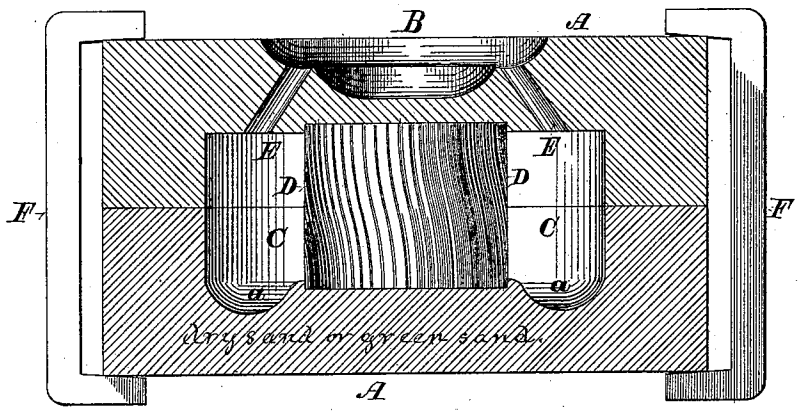


Fig. 2.

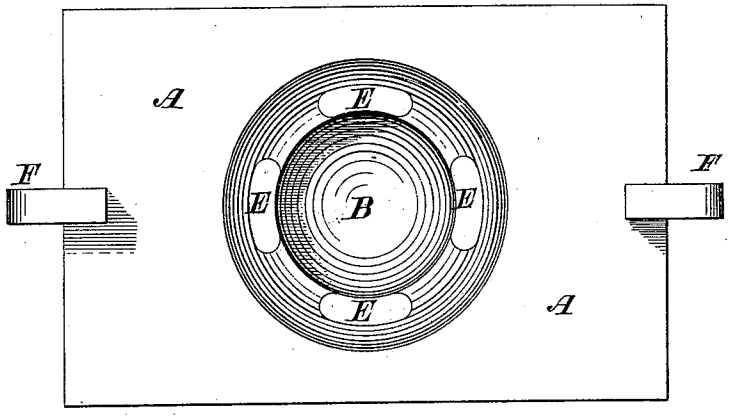
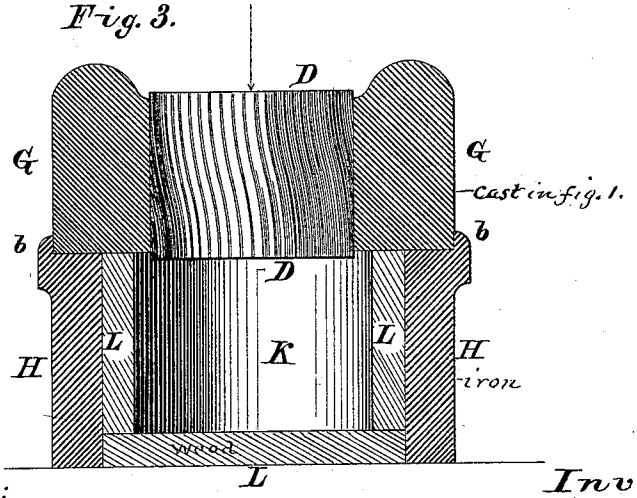


Fig. 3.



Witnesses:
Chas. D. Goss.
James G. Flanders

Inventor,
Hans Birkholz,
per D. H. Bowman
Attorney.

UNITED STATES PATENT OFFICE.

HANS BIRKHOLZ, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO EDWARD P. ALLIS, OF SAME PLACE.

APPARATUS FOR CASTING CHILL-RINGS.

SPECIFICATION forming part of Letters Patent No. 404,888, dated June 11, 1889.

Application filed April 22, 1884. Serial No. 128,883. (No model.)

To all whom it may concern:

Be it known that I, HANS BIRKHOLZ, of the city and county of Milwaukee, and State of Wisconsin, have invented certain new and useful Improvements in an Apparatus for Casting Chill-Rings for Corrugated Rollers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The objects of my invention are, first, the production of a mold or chill-ring by which a chilled grinding-roller may be cast with its corrugations complete at a single operation, and, second, the production of a cast-iron mold of cylindrical form, spirally corrugated on the inside and free from flaws and defects about its corrugations.

In the accompanying drawings like letters refer to the same parts in each figure.

Figure 1 is a vertical medial section of a mold, showing also in elevation a master-roll used for a core, about which the chill-ring is cast. Fig. 2 is a plan view of the mold, showing the basin and segmental gates by which the mold is filled; and Fig. 3 is a vertical medial section of the chill-ring or mold with the master-roll in elevation, and a cylindrical block H, showing the method of removing the master-roll from the ring or mold cast about it.

A A is a mold made preferably of dry sand, such as is commonly employed for the finer grades of casting, although the ordinary green sand may be used. The mold is divided horizontally near its center into two segments.

D D is a master-roll into which corrugations of the desired shape and size have been cut. Its ends are embedded slightly, one in the upper segment and the other in the lower segment of the mold A, and about it is formed a cylindrical or annular cavity C C. Into the top of this cavity open segmental gates E E, through which the iron is poured into the mold. The bottom of the cavity C is scooped out, forming an annular depression *a a*, which at its center is considerably below the exposed face of the roll D. The top of the upper segment of the mold is formed at the middle into the basin B, the center of which is deeper than the portion about the rim, where the gates E E open outward, as seen in Figs. 1 and 2.

F F are iron jaws by which the segments of the mold are firmly clamped together in the usual way.

After preparing the mold as hereinbefore described the deep central part of the basin B is filled with melted iron, and as soon as it rises to the level of the openings of the gates E E the ladle is quickly turned and the remainder of the basin suddenly filled. In this way the heavy impurities of the iron sink to the bottom of the basin, while the lighter impurities rise to the surface above the openings of the gates E E. At the same time the mold is quickly filled through the segmental gates from the dense pure metal filling basin B, which is kept full, so that the light impurities will remain during the operation at the surface above the openings into the gates. As the metal flows into the mold it first fills the annular depression *a a*, which retains the heavier impurities gathered up by the melted metals, while the lighter impurities rise to the surface and are carried up as the mold is filled into the gates E E, thus leaving around the master-roll the purest iron, which solidifies and forms the cylindrical mold or chill-ring G G, with sharp spiral grooves on its inner face corresponding with the corrugations upon the master-roll D D. By this arrangement also the intensely-heated metal as it falls into the mold first strikes the bottom of depression *a a*, and as it rises comes gently against the surface of the master-roll D, thereby avoiding injury to its sharp corrugations, which would be liable to injury if the metal were poured into the mold directly against them. As soon as it is sufficiently cooled the chill-ring G G, with the master-roll D D about which it is cast, is removed from the mold A, inverted, and placed upon a cylindrical iron block H H, which has flanges or lugs *b b* about its upper and outer edge to hold the chill-ring G in place while the master-roll D is

driven out by a force applied in the direction of the arrow shown in Fig. 3. The cylindrical block H is lined with pieces of wood L L, to prevent injury to the roll as it drops into the space K, made sufficiently large to receive the same. After the master-roll has been removed from the chill-ring G the convex portion of the latter formed in the depression *a* of the mold A is turned down to a plane surface, and the other end is also turned down smooth, thus removing any impurities which may have been caught in the same.

The mold or apparatus in which the chill-ring herein described is employed for casting corrugated rollers I make the subject of another application for Letters Patent of even date herewith.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, in a mold for casting chill-rings for corrugated rollers, of a corrugated master-roll or chill-core, a sand mold formed about the same and having an annular depression at the bottom below the exposed face of said master-roll or chill-core, and a gate or gates leading into the upper part of said mold, substantially as and for the purposes set forth.

2. The combination, in a mold for casting chill-rings for corrugated rollers, of a corrugated master-roll or chill-core, a sand mold formed about the same, an annular depression at the bottom of said mold extending below the exposed face of said master-roll or chill-core, a feeding-basin formed at the top of said mold, and a gate or gates connecting said basin above its bottom with the upper part of said mold, substantially as and for the purposes set forth.

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

HANS BIRKHOLZ.

Witnesses:
CHAS. L. GOSS,
GEORGE GOLL.