

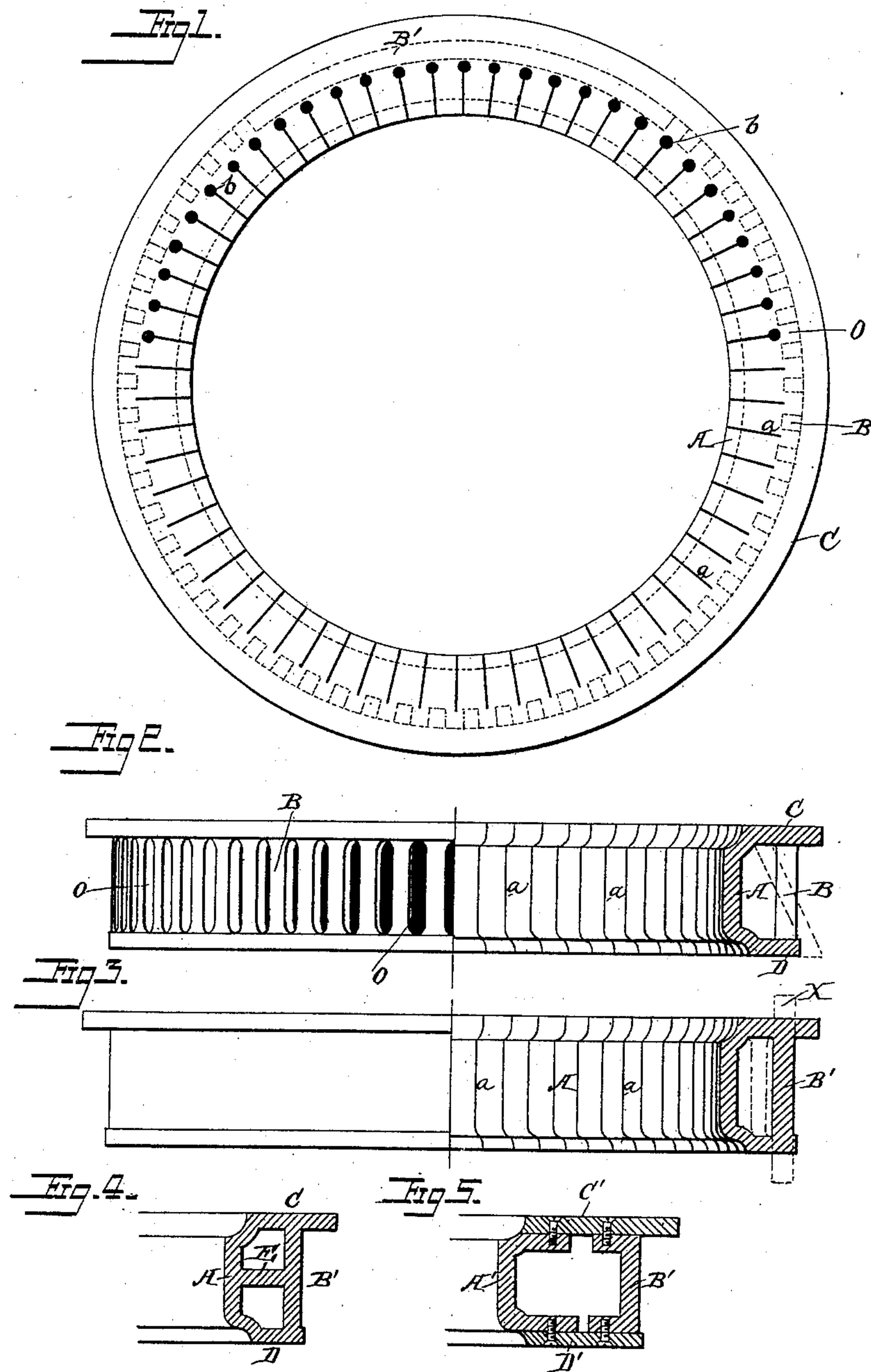
(No Model.)

J. R. WHITNEY.

CHILL.

No. 358,094.

Patented Feb. 22, 1887.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOHN R. WHITNEY, OF RADNOR, DELAWARE COUNTY, PENNSYLVANIA.

CHILL.

SPECIFICATION forming part of Letters Patent No. 358,094, dated February 22, 1887.

Application filed July 8, 1886. Serial No. 207,449. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. WHITNEY, a citizen of the United States, and a resident of Radnor township, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Chills, of which the following is a specification.

My invention consists in improvements in chills, hereinafter fully described, and designed to be used in casting railroad-car wheels and other chilled castings, whereby I am enabled to proportion the thickness of the chilling surface to the mass of metal to be chilled, and at the same time maintain its uniform density, with more ease and certainty and with less expense than heretofore.

In the accompanying drawings, Figure 1 is a top plan of my improved chill. Fig. 2 is a part side view and part vertical section through Fig. 1. Fig. 3 is a part side and sectional view of Fig. 1, showing a modification. Fig. 4 is a cross-section of another modification of Fig. 1. Fig. 5 is a vertical section of my improved chill, showing its several parts in separate plates and rings.

It is well known by all familiar with the art that the depth of chill in a casting is very much influenced by the thickness of the chilling surface, a thick chilling surface or body producing in the same iron a much deeper chill than a thin one, and a chill of uneven thickness producing an uneven chilling of the article cast. Thus if chills of the ordinary form are used in casting light wheels with thin treads for mining purposes and for city railways they often chill them too deeply, and they are in consequence liable to break. The chill used is itself, if strong enough for the service required of it, (being from one to two inches in section,) too thick. For some purposes it is desirable that the chilling surface should not be more than one-fourth of an inch in thickness. By my improvement I am enabled easily and economically so to construct a chill that it shall be accurately proportioned to the depth of chilling effect required in casting, and at the same time produce a chilling effect of uniform depth.

In my improved chill there is a hollow ring in one continuous casting with the chilling surface thereon. In the construction shown

in Fig. 2 the top and bottom flanges, C D, of said casting are braced by connecting-posts B. In Fig. 3 there is a continuous wall, B', instead of the posts, and in Fig. 5 circular plates C' D' are bolted to the flanges of the continuous hollow ring and to the brace-wall B'.

When the chill is made in one casting cored out as in Figs. 2 and 3, the holes made in the upper and lower plates, C and D, by the legs which supported the cores may be left open, forming openings in the chill at *b b*, Fig. 1, for the passage of air to keep the chill from becoming overheated; or, if desired, they may be closed up by plugs of any suitable metal. I prefer, however, to support the cores by extending them radially outward, so as to form anchoring-legs bedded in the surrounding sand of the mold and peripheral openings O in the chill. The chill, when cast in this manner, will have the upper and lower plates, C and D, connected with each other by a series of columns or posts, B, as shown in Figs. 1 and 2. The outer ring, whether unbroken, as shown in Fig. 3, or thus divided into a series of columns connecting the upper and lower plates, may be either vertical or placed at any desired angle to the upper and lower plates, as shown by the dotted lines, Fig. 2.

The openings *b*, Fig. 1, in the upper and lower plates may be used in connection with those in the outer ring, O, Fig. 2; or either may be used without the other, or all may be dispensed with entirely, if so desired, without detracting at all from the value of the chill.

If desired, there may be interposed between the upper and lower plates one or more horizontal or vertical webs. In Fig. 4 a horizontal web, E, is shown connecting the inner chilling ring or surface, A, with the outer ring or with columns B', to give increased strength, when necessary. If preferred, these webs may be placed at any desired angle, instead of being horizontal or parallel with the upper and lower plates, C and D; or they may be placed vertically, so as to connect the upper and lower plates, as shown in dotted lines, Fig. 3. In either case such web or webs divide the hollow chill into two or more uninterrupted annular chambers and give it increased strength and stiffness. It is manifest, also, that increased strength and stiffness may, if preferred, be se-

cured by extending the outer ring, B', or its equivalent, above and below the upper and lower plates, C D, as shown by the dotted lines X, Fig. 3. It will be readily seen that by thus making the chill in the form of a hollow ring, with one or more annular chambers, any desired thickness of the chilling surface A may be easily and cheaply obtained. When the chill is cast in one piece, this result is secured by simply varying the size of the annular core or cores. At the same time the chill, being in the form of a continuous hollow ring, is very much lighter than if solid, its strength is not diminished, and the uniform density of all its parts is easily maintained. It is also less liable to warp. In making such a chill it may have the usual lugs and trunnions, if desired; but I prefer to make it without either, thus securing more uniform expansion and contraction of its parts when in use.

To increase the efficiency of my improved chill, the chilling surface or inner ring, A, should be divided into sections or segments, as shown at *a a* in Figs. 1, 2, and 3, and as more fully described in Letters Patent of the United States issued to me November 16, 1886.

The dividing-slits *a* may be extended into the upper and lower plates as far as may be desired. When the openings *b b* are desired, the slits *a* may terminate in the upper and lower plates, as shown on one half of Fig. 1.

I am aware that hollow chills have heretofore been made so as to introduce water or steam into the hollow chamber to control the expansion and contraction; but in all such chills it is absolutely necessary to have at least one permanent inlet and one permanent outlet opening, for the ingress and egress of the water or steam, with a partition across the

annular chamber to direct and control the flow. In my improved form of chill, however, no such agents as water or steam are used, and it may have, therefore, any number of holes in the upper and lower plates and outer ring that may be desired, or be entirely without them.

Without limiting myself to any special construction and arrangement of the parts I have described, I claim—

1. A chill consisting of a hollow ring formed in one continuous casting, with its chilling surface divided into sections, substantially as set forth.

2. A chill consisting of an upper circular continuous plate and a lower circular continuous plate, connected with each other by an inner ring forming the chilling surface and by an outer series of columns or webs forming open air-spaces, substantially as set forth.

3. A chill consisting of an upper and lower plate perforated at intervals and connected with each other by a continuous inner ring, forming the chilling surface, and by an outer support, substantially as set forth.

4. A chill consisting of a hollow ring formed in one continuous casting, with its inner ring or chilling surface divided into sections, and the outer ring projecting beyond the upper or lower faces of the chill, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN R. WHITNEY.

Witnesses:

L. M. GARRISON,
WM. S. DARLINGTON.