

993,117.

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Fig. 1. 2

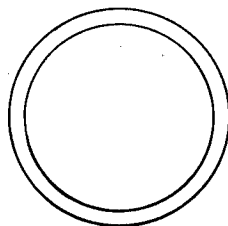


Fig. 2.

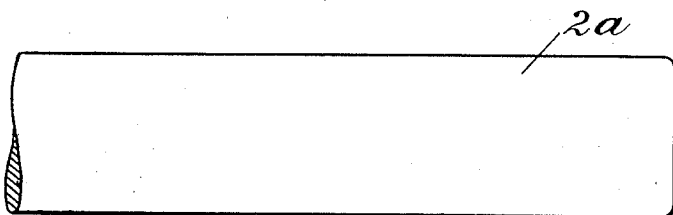


Fig. 3.

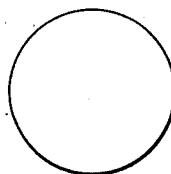


Fig. 4.

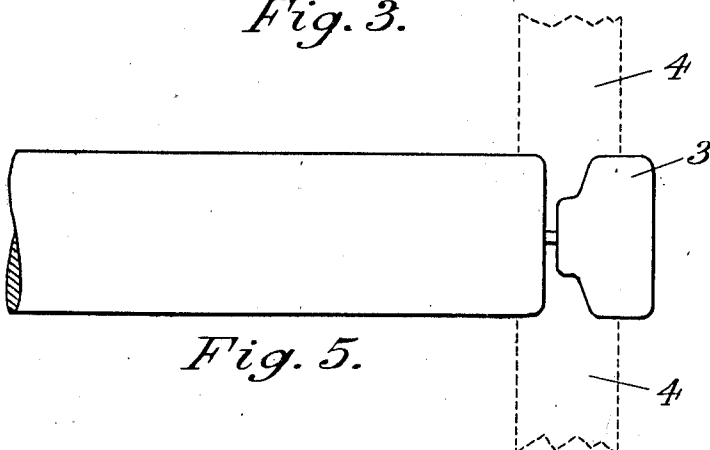


Fig. 5.

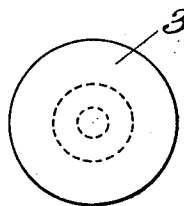


Fig. 6.

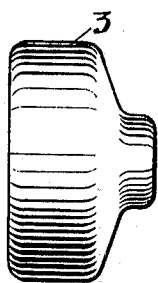


Fig. 7.

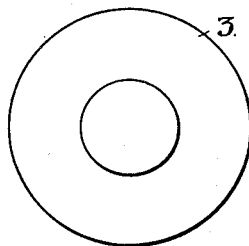


Fig. 8.

WITNESSES

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UNITED STATES PATENT OFFICE.

EDWIN E. SLICK, OF PITTSBURG, PENNSYLVANIA.

METAL WHEEL-BLANK.

993,117.

Specification of Letters Patent. Patented May 23, 1911.

Original application filed January 3, 1907, Serial No. 350,607. Divided and this application filed January 26, 1910. Serial No. 540,279.

To all whom it may concern:

Be it known that I, EDWIN E. SLICK, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Metal Wheel-Blank, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to the manufacture of metal blanks which are afterward formed into wheels or circular bodies having a peripheral tread portion, by rolling or forging.

Heretofore, in the manufacture of wheels and tires in one method, the blanks have been cast, each blank forming a single wheel or tire. Such blanks are then hammered, punched, and in forming tires are beaked and then finished on a tire rolling mill. In making wheels by other methods the blanks heretofore used have either been cast, one for each wheel, or the single blanks have been cut or sheared from a rolled slab, the slab forming a series of blanks and being reduced from an ingot, the reducing operation elongating the ingot, increasing its width and decreasing its thickness so that in cross section the rolled ingot or multiple length slab has a thickness less than the width. Single rectangular slabs are then cut from the rolled ingot and are then formed into circular blanks, either by removing the corners by a shearing operation or by forging the blanks edgewise into a substantially circular blank having a diameter greater than its thickness. In forming single blanks in this manner the axial center of the resulting circular blank corresponding to the axial center of the finished wheel, extends in a direction perpendicular to the fibers of the metal in the single blank and perpendicular to the longitudinal axis of the cast ingot and of the multiple length blank. The use of such blanks results in the grain or fibers of the metal extending in a direction across the diameter of the finished blank and of the finished wheel.

The object of my invention is to provide an improved blank suitable for forming afterward into a wheel, tire or other circular body having an annular tread, formed in such manner that the axial center of the wheels formed from such blanks corresponds to and extends in the same direction relatively to the fibers of the metal, in the wheel,

wheel blank, ingot and, where the ingot is reduced in cross section after being cast, in the reduced ingot.

The preferred method of forming the blanks is shown in my Patent No. 965,033 dated July 19, 1910 of which this is a divisional application.

Referring to the drawings, Figure 1 is a longitudinal side elevation and Fig. 2 an end elevation of an ingot adapted for use in making my improved wheel blanks. Fig. 3 is a side elevation and Fig. 4 an end elevation of an ingot which has been reduced in cross section by a rolling or forging step in the operation of forming the wheel blanks of my invention. Fig. 5 is a side elevation and Fig. 6 an end elevation showing the manner in which the ingots or multiple length blanks are severed transversely into single wheel blanks. Fig. 7 is a side elevation and Fig. 8 is an end elevation showing a wheel blank constructed in accordance with my invention.

In the forming of wheel blanks as covered by this invention, the ingot 2 is cast, preferably circular in cross section. The ingot is then reduced in cross section and elongated either by forging or by passing it through the rolls of a rolling mill, or otherwise, when found desirable, the resulting product being illustrated by 2^a in Figs. 3 and 4. Instead of casting a cylindrical ingot as shown, an ingot of polygonal or other cross section may be formed which may or may not be reduced later to a circular cross section. The ingot 2, or where the ingot is reduced in cross section, the rolled ingot 2^a, is then caused to rotate and is severed transversely of its longitudinal axis into single wheel blanks 3 by means of any suitable opposing shear knives, the apparatus shown in my Patents Nos. 965,033 or 965,037 dated July 19, 1910 preferably being employed. It will be noted by reference to Fig. 4 that the severing disks approach each other in the same plane, and that as the disks 4—4 are caused to approach in the severing operation, the blanks are subjected to a rolling action (*i. e.* a forging effect) during the severing operation which densifies and changes the side surfaces of the blank into a fibrous structure, the fibers extending in a substantially spiral direction outwardly from the axial center of the blank, so that the sides of the blank will be densified particu-

larly after the disks have partly severed the blank by the action of the disks in entering the cut in the ingot or bloom, and that the disks are shaped so as to form a reduced central projection on one face or side of the resulting blank, while the edges of the blanks are all rounded to a substantial curve in severing the blanks. The single wheel blanks severed from the ingot are reheated and are then subjected to a further reducing operation in which they are formed into wheels, these later operations being carried out in any existing apparatus adapted for such purpose, preferably being formed into wheels with the apparatus and by the method disclosed in my Patents Nos. 965,032 or 965,035 dated July 19, 1910.

The advantages of my invention will be apparent to those skilled in the art. By maintaining the axis of the blank in a certain relation relative to the fibers of the metal, in the ingot and transversely severed blanks, as well as in the finished wheel, a superior product is obtained and the resulting wheels are more durable and of greater density and strength than forced metal wheels as made heretofore. The operation of severing transversely the successive blanks from the multiple length ingot or bloom has a rolling or forging action upon the side surfaces of the blank and compacts and densifies the metal in the outside of the blank and causes the severed surface on the opposite ends of the blank to provide a wheel having a cleaner and better finish than has heretofore been possible.

With blanks when formed as described, the metal displaced in the wheel forming operation into the flange and tread of the wheels will be densified in the rolling, cutting operation and provide a wheel having a flange and tread formed of metal which has been worked or forged to a degree which insures a superior quality at the points on

the wheel where the greatest strength and durability is required. The outer surface of the ingot or cast blank is kept as the outer surface of the single blanks when formed, and the axial center of the ingot, in which the poorest metal is found, is kept as the axial center of the resulting blanks and, as the blanks must be pierced later, this inferior metal is densified in being displaced in forming the hub of the resulting wheel or other article, a location where the least strength is necessary and inferior material can do the least harm.

Modifications in the shape of the blank may be made without departing from my invention. The thickened axially central portion may be omitted and other changes within the scope of the appended claims may be made.

I claim;

1. As a new article of manufacture a forged metal blank having densified side surfaces of substantially spirally extending fibrous structure; substantially as described.

2. As a new article of manufacture a forged metal blank having a thickened axially central portion and side surfaces of substantially spirally extending fibrous structure; substantially as described.

3. As a new article of manufacture a metal wheel blank having a densified outer skin surrounding an interior portion of less density, the outer skin of the side surfaces having a fibrous structure extending substantially spirally outward from the axial center of the blank; substantially as described.

In testimony whereof, I have hereunto set my hand.

EDWIN E. SLICK.

Witnesses:

R. D. LITTLE,
H. M. CORWIN.