

W. McCONWAY.
METHOD OF MANUFACTURING BLANKS FOR CAR WHEELS OR TIRES.
APPLICATION FILED JULY 26, 1910.

994,020.

Patented May 30, 1911.

Fig. 1

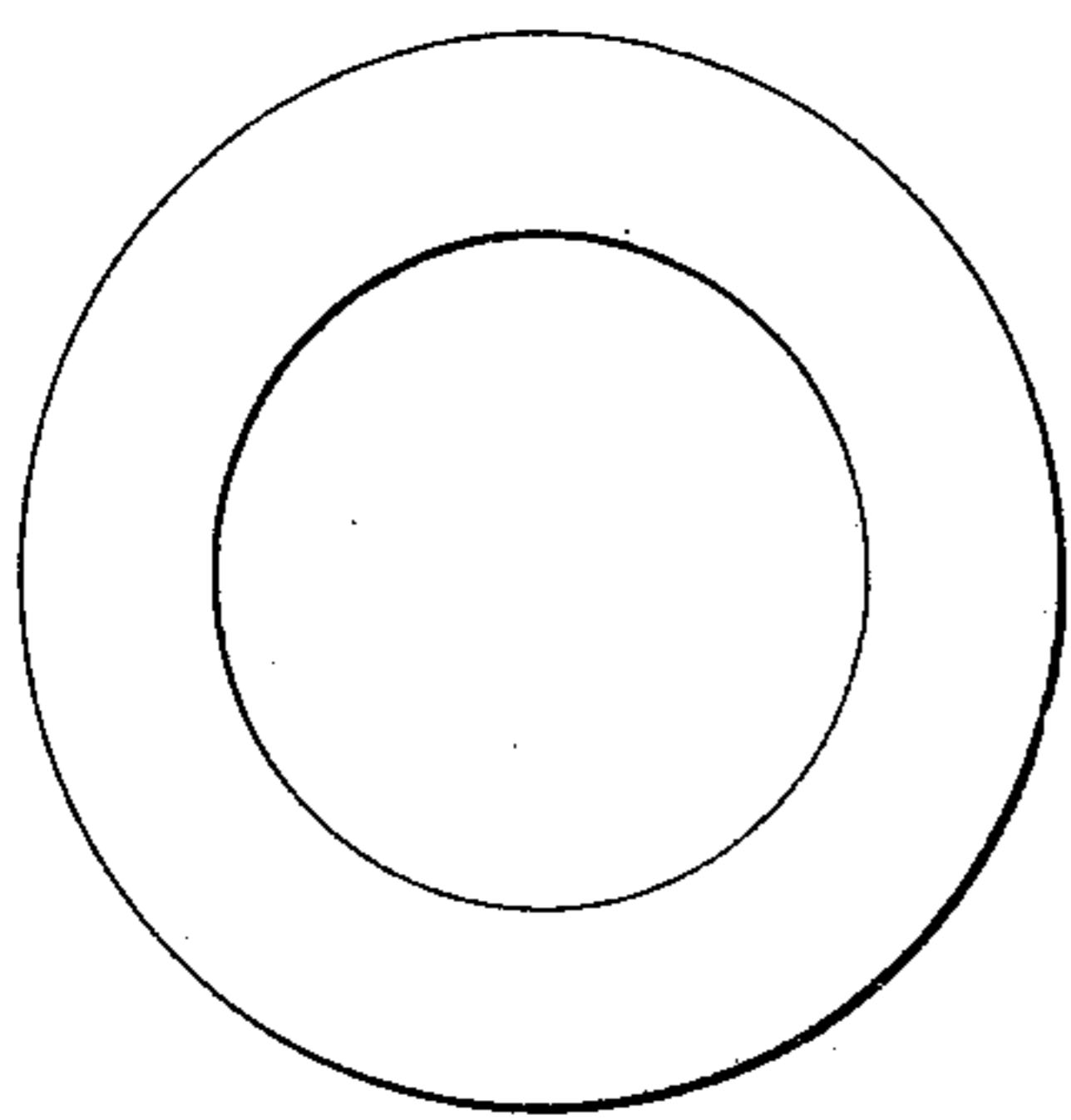


Fig. 3.

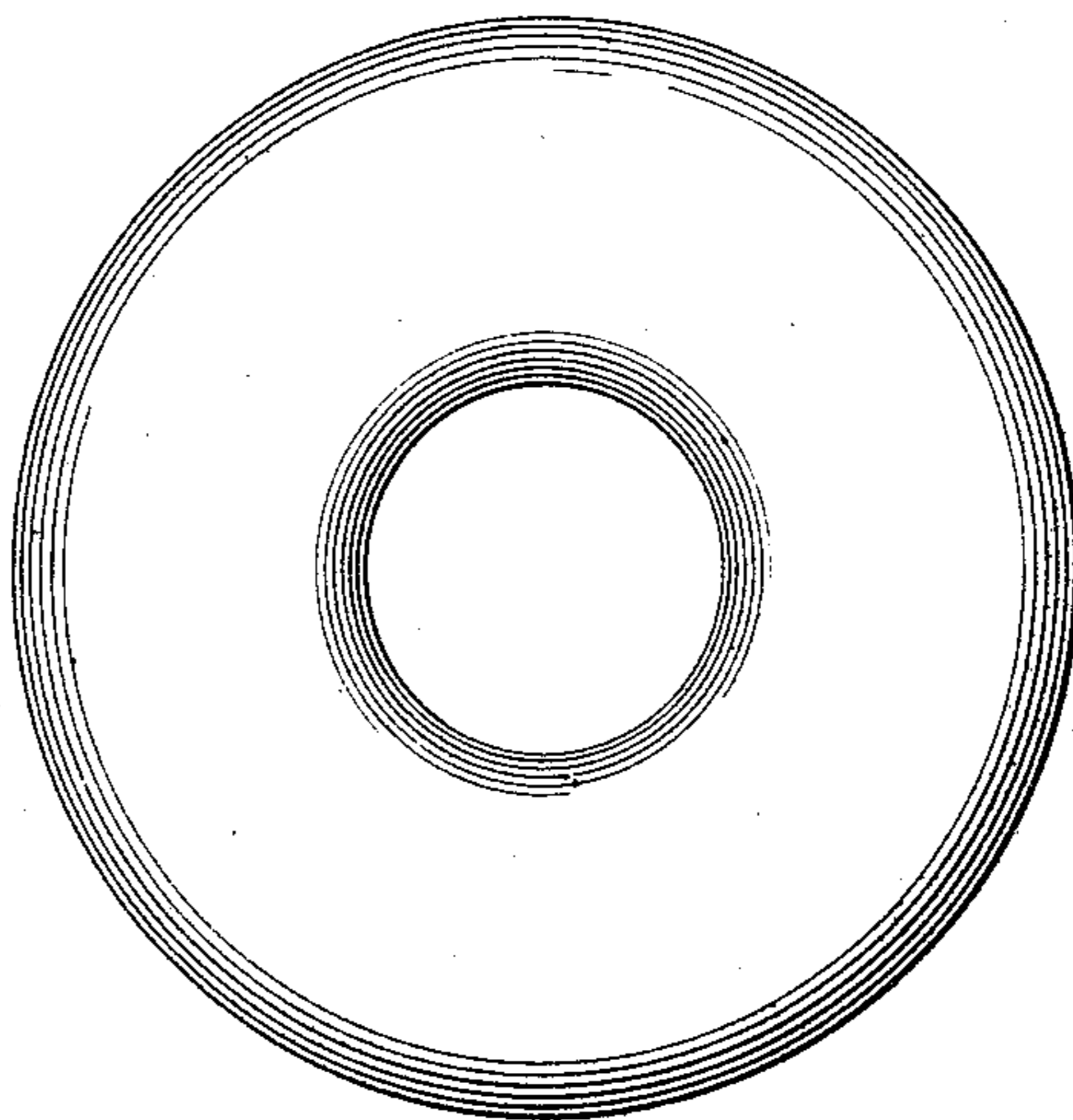


Fig. 2.

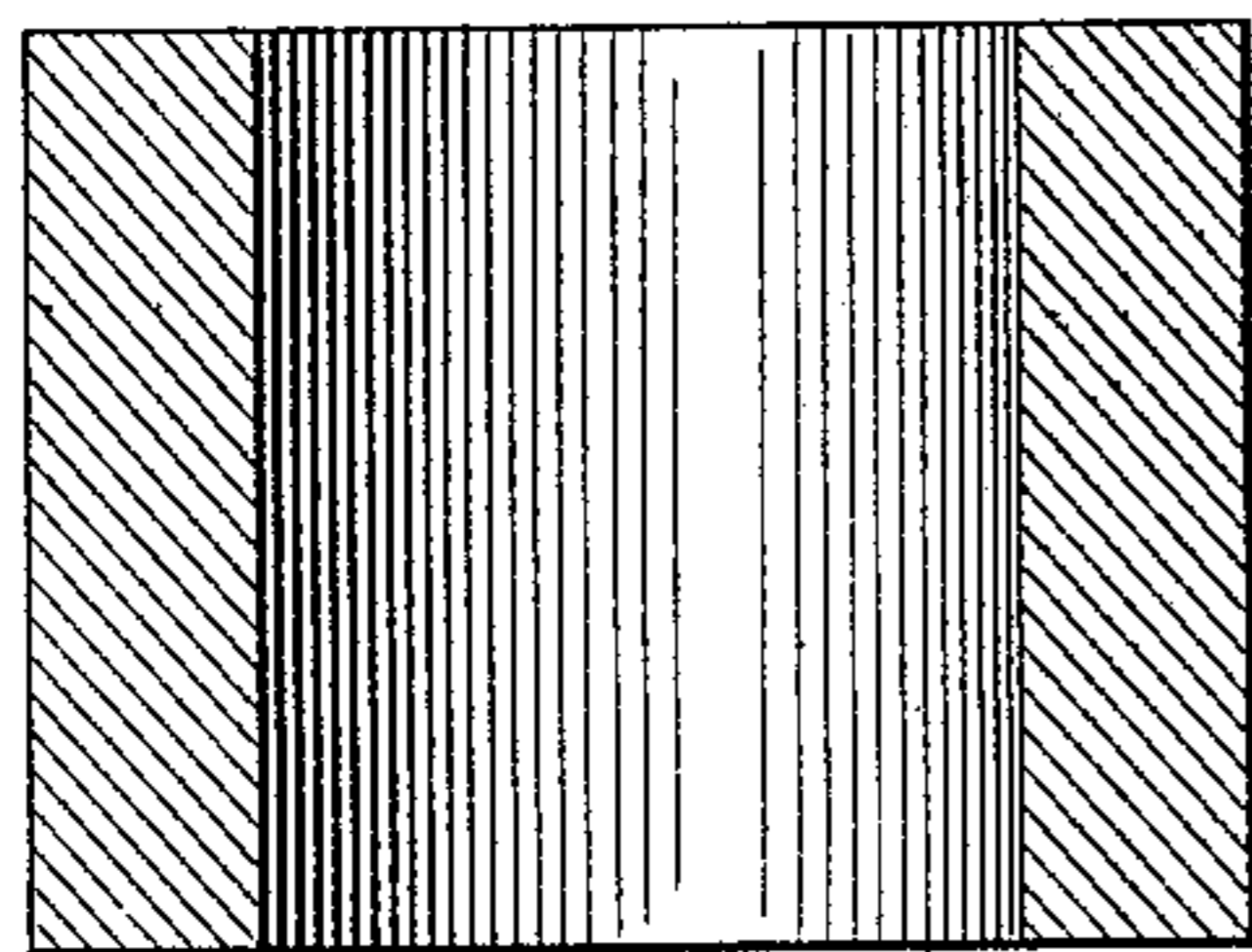
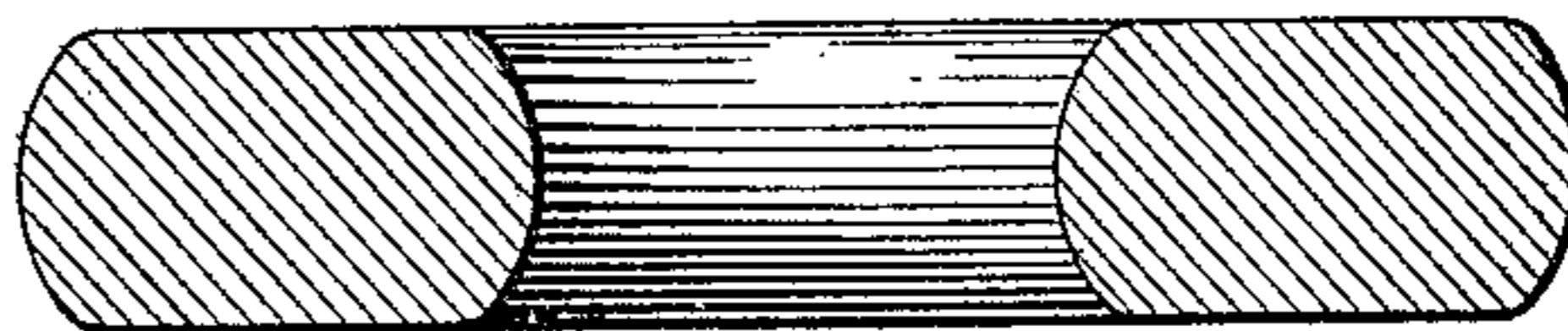


Fig. 4.



Inventor

Witnesses

Edwin L. Bradford
Wm. E. Dye.

William McConway
by W. Ritter Jr.

Attorney

UNITED STATES PATENT OFFICE.

WILLIAM McCONWAY, OF PITTSBURG, PENNSYLVANIA.

METHOD OF MANUFACTURING BLANKS FOR CAR WHEELS OR TIRES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM McCONWAY, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Methods of Manufacturing Blanks for Car Wheels or Tires; 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 relates to a method of making a blank suitable for being subsequently rolled or forged to produce a finished car wheel or tire.

In making a forged wheel almost the entire difficulty is experienced in producing the blank, rather than in rolling the wheel to a finish after the blank has been secured. As is well known, large steel ingots, and particularly solid ingots of square cross-section such as are usually cut into appropriate lengths to form a car wheel or tire, are defective in their upper sections by reason of the piping attendant upon the solidifying of the steel in cooling. The presence of this pipe necessitates the rejection of a very considerable portion of the upper section of the ingot, if fatal defects in the articles to be fabricated from the ingot are to be avoided. Moreover, during the slow cooling of ingots of large cross-section the elements of the steel segregate and the steel, therefore, varies in quality throughout the mass.

It is the object of my invention to eliminate these defects from blanks which are to be made into car wheels or tires and also to render possible the economic manufacture of car wheels and tires of uniform quality.

To this end, my invention, generally stated, consists in casting the metal for the wheel or tire as an ingot of attenuated section and thereafter subjecting said ingot to pressure.

In the accompanying drawings illustrating one form of ingot and blank fabricated in accordance with my invention, Figure 1 is a plan view of a form of ingot suitable for being formed into a blank for a car wheel or tire; Fig. 2 is a longitudinal section of the ingot shown in Fig. 1; Fig. 3 is a plan view of a blank produced in accordance with my invention from the ingot illustrated in Figs.

1 and 2; and Fig. 4 is a diametric section of the blank shown in Fig. 3.

Like symbols refer to like parts wherever they occur.

I will now proceed to describe my invention more fully, so that others skilled in the art to which it appertains may apply the same.

The first step in my method consists in casting the steel in an ingot of such attenuated section as will secure a quick setting of the mass of metal and a substantially uniform rate of cooling, thereby practically eliminating piping of the ingot and segregation of the elements of the steel, and producing an ingot of uniform quality throughout. Once the metal has set, however, the matter of cooling is of very minor importance. In Figs. 1 and 2 is shown a hollow ingot of cylindrical form having an attenuated cross-section. The cylindrical form of hollow ingot is preferable as such form promotes uniformity of cooling and at the same time is especially adapted for the facile production of a finished blank of desirable form for subsequent rolling. The external diameter of the cylindrical ingot is preferably less than the outside diameter of the blank to be formed therefrom, and it is desirable that the inside diameter of the ingot shall be greater than the diameter of the perforation in the completed blank, as such relative dimensions secure uniformity in the flow of metal, both inwardly and outwardly, throughout the mass transversely of the direction in which pressure is applied in the subsequent pressing or forging operation. In order to minimize the number of operations necessary to produce the completed blank it is preferable to cast the cylindrical ingot of such internal diameter that the subsequent pressing operation, by which the length of the ingot is decreased and its walls thickened, shall result in a completed blank in which the central aperture is sufficiently large to permit the operation of the rolling mechanism to be employed for finishing the wheel or tire. By this means the necessity of piercing or punching a suitable central hole in the blank is avoided and the use of a mandrel, which would more or less impede the free inward flow of the metal, is not required during the pressing operation to insure the desired internal diameter of the

completed blank. It is also preferred that the amount of metal in the ingot shall be that required for the finished wheel or tire, as the step of cutting the appropriate mass of metal from the ingot is thereby obviated. Sand molds or molds partly of sand and partly of iron are well adapted for casting these ingots.

The second step in the method of producing this blank is that of decreasing the length of the ingot of attenuated form and simultaneously increasing its thickness and external diameter, thus producing a blank ready for rolling or other method of finishing which is to follow. Figs. 3 and 4 illustrate a completed blank formed from the hollow cylindrical ingot shown in Figs. 1 and 2. In performing this second operation the hollow cylindrical ingot properly heated, is preferably placed in a hydraulic press the movement of which is parallel with the axis of the cylinder. Under the compression applied by the press the heated, plastic metal in the walls of the cylinder flows transversely both inwardly and outwardly, so that the inner and outer peripheral surfaces assume a convex form, as shown in Figs. 3 and 4, and the blank is brought to the proper thickness and the diameter of its external periphery increased to that required for the wheel or tire to be made.

While I have explained my invention by reference to the concrete illustration of a car wheel or tire, since the advantages resulting from the practice of my method are particularly desirable in car wheels and tires, yet it will be apparent that my method is applicable to the manufacture of annular articles generally, and it is therefore to be understood that the terms car wheel and tire appearing in the claims are to be considered as comprehensive of other annular articles.

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

1. The method of forming blanks for car wheels or tires which consists in casting a

hollow ingot of steel and subjecting said ingot when heated to pressure applied in the direction of its length.

2. The method of forming blanks for car wheels or tires which consists in casting a hollow cylindrical ingot of steel and subjecting said cylindrical ingot when heated to pressure parallel to its axis.

3. The method of forming blanks for car wheels or tires which consists in casting a hollow, steel ingot having its external diameter less than the outside diameter of the completed blank, and subjecting the ingot when heated to pressure applied in the direction of its length to increase its external periphery.

4. The method of forming blanks for car wheels or tires which consists in casting a hollow, steel ingot having its internal diameter greater than the inside diameter of the completed blank, and subjecting the ingot when heated to pressure applied in the direction of its length to decrease its internal diameter.

5. The method of forming blanks for car wheels or tires which consists in casting a hollow, steel ingot containing the quantity of metal required to form the wheel or tire, and subjecting the ingot when heated to pressure parallel to its direction of length.

6. The method of forming blanks for car wheels or tires which consists in casting a hollow, cylindrical, steel ingot having its external diameter less than the outside diameter of the completed blank and having its internal diameter greater than the inside diameter of the completed blank, and subjecting said ingot to pressure applied in the direction of its length when said ingot is in a heated condition.

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

WILLIAM McCONWAY.

Witnesses:

M. McBUCKINGHAM,
J. McFARLANE.