

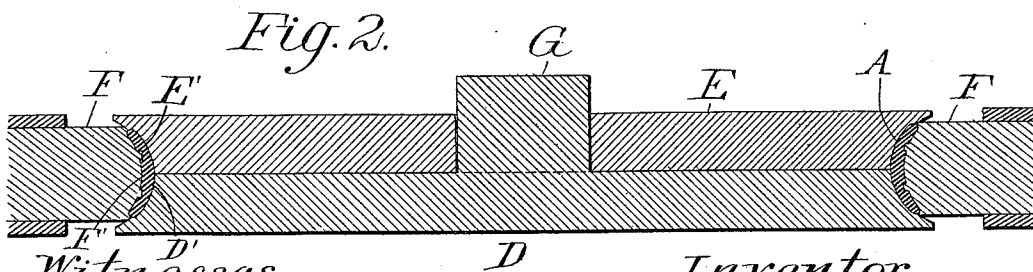
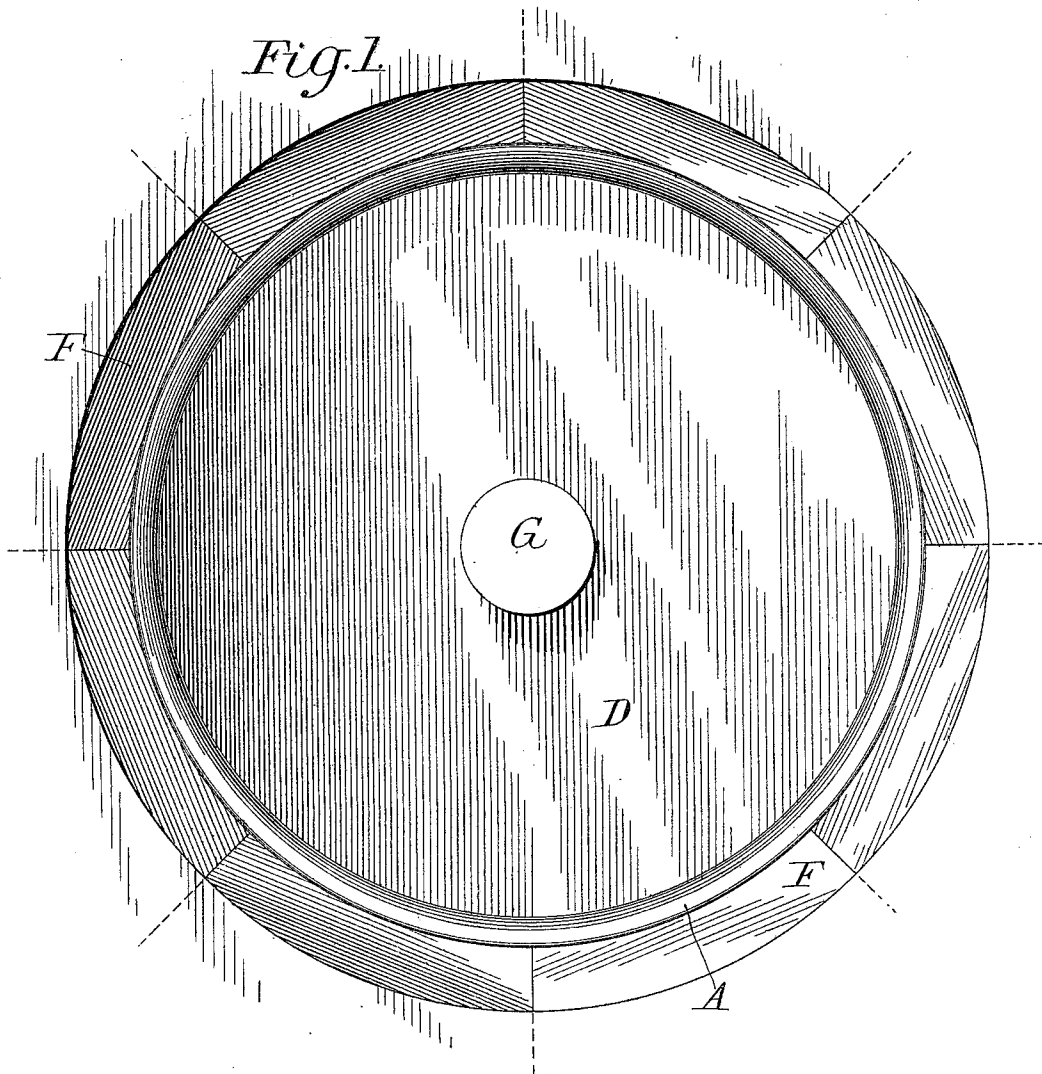
(No Model.)

2 Sheets—Sheet 1.

F. TAYLOR.
WHEEL RIM.

No. 566,244.

Patented Aug. 18, 1896.



Witnesses:

Baltus DeLong.
Edward A. May.

Inventor:

Franklin Taylor
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Fig. 5. Fig. 6.

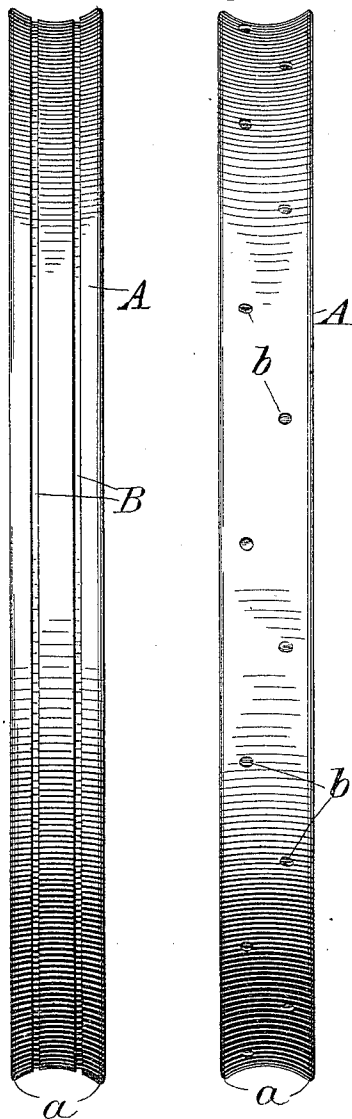


Fig. 3.

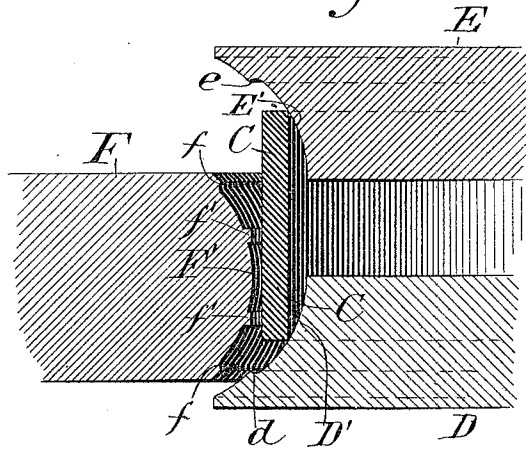
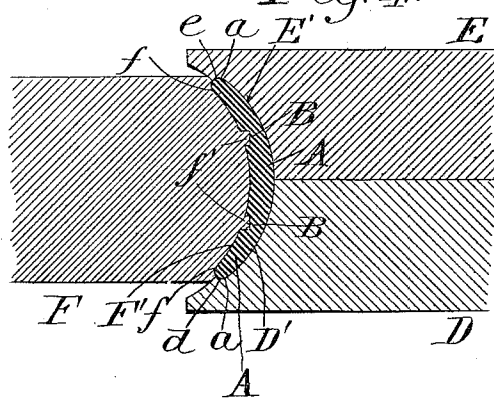


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANKLIN TAYLOR, OF WILMINGTON, DELAWARE.

WHEEL-RIM.

SPECIFICATION forming part of Letters Patent No. 566,244, dated August 18, 1896.

Application filed June 2, 1896. Serial No. 594,030. (No model.)

To all whom it may concern:

Be it known that I, FRANKLIN TAYLOR, of Wilmington, in the county of New Castle and State of Delaware, have invented certain new and useful Improvements in Wheel-Rims and in the Methods of Making Them; 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 certain improvements, as hereinafter claimed, in wheel-rims of the class adapted to receive pneumatic tires and in the manner of producing them.

My object mainly is to provide a wheel-rim made in one piece without seam or joint and of homogeneous structure throughout, and which shall possess great strength, toughness, and durability, and shall not be liable to crack, warp, chip, or scale off, or to bend, buckle, or become otherwise misshapen in use. My object, particularly, is to construct the rims so as to especially adapt their edges, where they are thin and most liable to be injured, to resist strains, shocks, and blows and so maintain their form, and also to best adapt the rims to facilitate and simplify the fitting of the spoke-nipples in place.

In the accompanying drawings, which show my improvements in rims and so much of suitable mechanism for producing the rims as is needed for illustrating a way of manufacturing them, Figure 1 is a plan view with the top former removed after the rim is formed, and Fig. 2 a vertical central section showing the rim-forming mechanism with the parts in the position assumed at the time of completing their work. Figs. 3 and 4 are views in vertical central section, showing different positions of the mechanism, the one view representing the parts with the rim-blank in place just prior to action thereon by the mechanism and the other illustrating the mechanism in final operative position. Fig. 5 shows a rim as completed, with the exception of the holes for the spoke-nipples; and Fig. 6 shows a slightly-modified construction of the rim.

I employ a material well known as "vulcanized fiber" in the production of my improved rims; but other substantially similar mate-

rials, or those possessing like properties and so suited for my purpose, known by different names, are to be regarded as obvious substitutes, or as coming under the name "vulcanized fiber" here given to the material employed.

The rim A, transversely curved to adapt it to receive a pneumatic tire, as commonly employed with bicycle-wheels, is made of greater density or compactness and is harder and tougher at its edges *aa* than intermediate thereof, where, as usual in rims of this form, it is thicker than at its edges. The rim is also hardened and toughened by having its density or compactness increased relatively to the density or compactness of its thick or intermediate portion at suitable distance from and on opposite sides of its center, at points where the rim is recessed, as at B B, upon its concave surface. These recessed hardened portions of the rim are to be perforated at suitable intervals for reception of the ordinarily-employed internally-threaded spoke-nipples, the heads of which rest in the recesses of the rim. No washers need be used in fitting the nipple-heads in these recesses, the material when properly compacted being so hard and durable as to render unnecessary the employment of washers under the nipple-heads to prevent wear on the rim or guard against pulling out or tearing through of the nipples. As shown in Fig. 6, instead of the continuous recesses B B, the "staggered" recesses *b b* may be provided, the material being condensed and hardened, as before, and the nipples adapted to be fitted to the rim without washers by perforating the rim centrally through the recesses.

Means for producing rims such as above described will now be explained.

The mechanism, many details of which are omitted as not needed for the purpose of properly setting forth my present improvements, and which is to be power-actuated in suitable way, preferably by hydraulic apparatus, comprises a circular stationary die or base-former D, a vertically-movable circular die or former E, and a series of radial horizontally-reciprocating dies or formers F. The base-former has its circular periphery D' vertically curved to correspond with the curvature transversely of one-half of the rim, and has an annular

shoulder *d* curved upon its upper surface for shaping one edge of the rim, and the upper former E, like the lower one, has its circular periphery E' suitably curved transversely for shaping one-half of the rim, and is provided with an annular shoulder *e*, the lower surface of which is suitably curved to adapt it to shaping the edge of the rim opposite that operated upon by the shoulder *d* of the lower former.

A central post G, rigid with the lower former, serves as a guide for the upper former, which is provided with a central bearing-opening to engage and slide upon the post. Each radial former F has the upper and the lower curved shoulders *f f* to shape the rim edges, the convex end F' of vertical curvature corresponding with the concave surface of the finished rim, and of horizontal curvature also corresponding with said surface of the rim, and is provided with the ribs or fins *f' f'* for forming the rim-recesses B B by compacting the material of the rim.

The rim-blanks, each complete in a single homogeneous piece, may economically be provided by cutting hollow cylinders of the material into suitable short sections or rings.

In operation a ring C, Fig. 3, of vulcanized fiber of suitable dimensions is subjected, while in properly-heated condition to best adapt it to be compressed or molded to form, to considerable pressure to shape it into the transversely-curved rim having the compacted and hardened edges and recessed portions, the ring being first placed about the lower former, while the upper former is elevated out of the way, after which the upper former is brought down so as to force the ring upon the lower former until the lower edge of the ring comes in contact with the shoulder of the lower former, while its upper edge bears against the shoulder of the upper former. The ring is thus transversely curved and centered for the action of the compacting formers F, which are brought with great force against the ring, Figs. 2 and 4, so as to finally shape the rim and make it more compact or dense and thinner, harder, and tougher at and adjacent to its edges and at its recessed portions than elsewhere, as will readily be understood. The radial formers and the upper former being now retracted, the rim is removed and another ring operated upon, the rims being thus very quickly and economically produced without resort to lathe-work or turning, and requiring little or no trimming or finishing-off work.

When removed from the forming mechanism, the rims are held in suitable way under sufficient pressure to keep them in shape during the short time required for them to cool off and become set.

In producing rims with the staggered recesses, as shown by Fig. 6, suitable lugs or projections are substituted for the ribs or fins *f' f'* upon the ends of the radial formers, as will readily be understood. I, however,

prefer the parallel continuous recesses B B, which strengthen and stiffen the rim.

It will be seen that the homogeneous material of the rim is compressed and hardened throughout, but to different extents at different parts, the blank being subjected to greatest pressure where greatest compactness in the rim is desirable. Obviously the excess of pressure to which the blank is subjected at the recessed and edge portions over that to which it is subjected elsewhere may be varied and variations be made in shape and in thickness at different parts of the rim.

Rims made of vulcanized fiber hardened and strengthened by compacting the material are rendered less liable to absorb moisture, as condensing the material closes its pores. They possess great strength, stiffness, and durability, are not liable to buckle, bend, or warp, will not split, crack, or chip off, and no treatment to which they may be subjected in use will result in the formation of splinters, slivers, scales, or blistered or lumpy surfaces.

The rims may be of any desired solid color—that is, the color may extend all through the material alike, so that in event of the cutting or indenting of a rim by accident or design, so as to expose the material beyond its original surface, the appearance of the rim would not be marred by contrast of color between the regular surface and the cut or indented portion.

Any desired transparent varnish may be applied to the rims, as usual with wood and composite rims, or the rims may be enameled or painted, as preferred.

I claim as my invention—

1. A wheel-rim formed of a seamless ring of vulcanized fiber, or similar material, curved, compressed and hardened, substantially as set forth.

2. The compressed, seamless, homogeneous, transversely-curved wheel-rim, of material such as set forth, of greater compactness at its edges than at its thicker intermediate portion, substantially as set forth.

3. The compressed, seamless, homogeneous, transversely-curved wheel-rim, of material such as set forth, recessed upon its concave surface and of greater compactness where recessed than at its thicker portion, substantially as set forth.

4. The hereinbefore-described compressed, seamless, homogeneous, transversely-curved wheel-rim, of material such as set forth, having the recessed portions and edges of increased compactness, substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

FRANKLIN TAYLOR.

Witnesses:

WILLIAM P. WEBB,
SAML. E. COOPER.