

No. 638,605.

Patented Dec. 5, 1899.

W. & L. H. SWAIN.
TIRE FOR WHEELS OF ROAD VEHICLES.

(Application filed Dec. 23, 1898.)

(No Model.)

FIG. 2

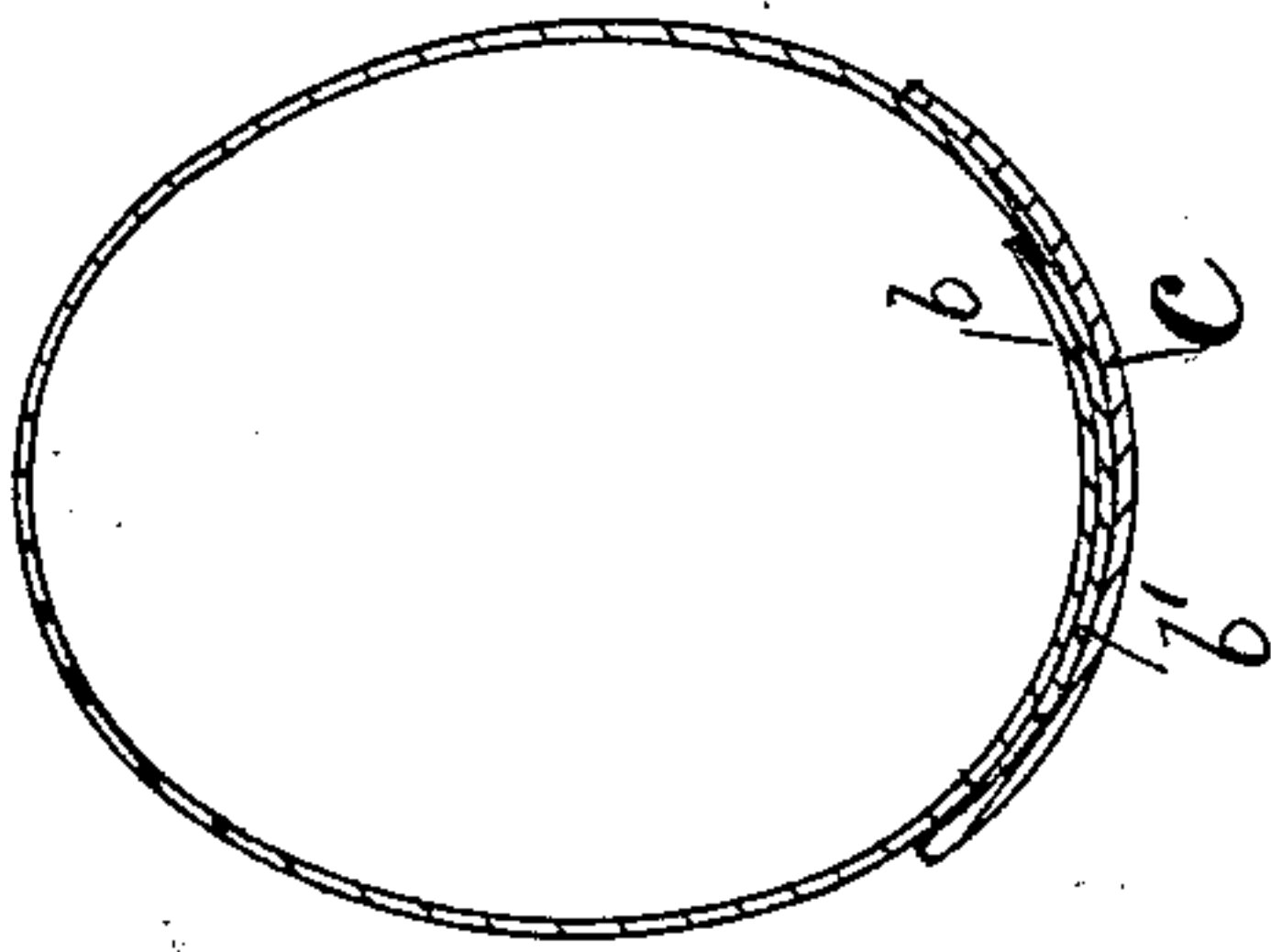


FIG. 1

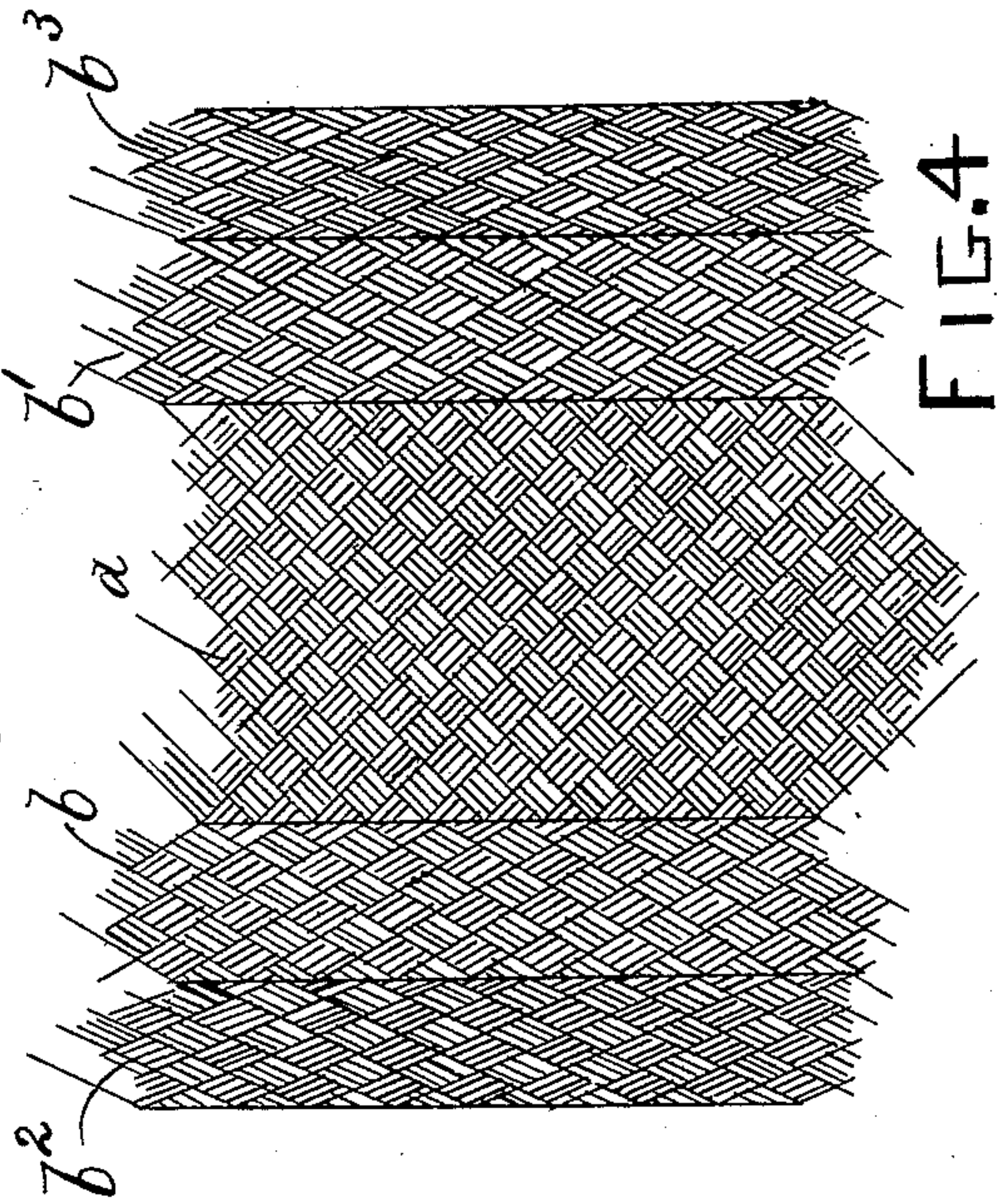
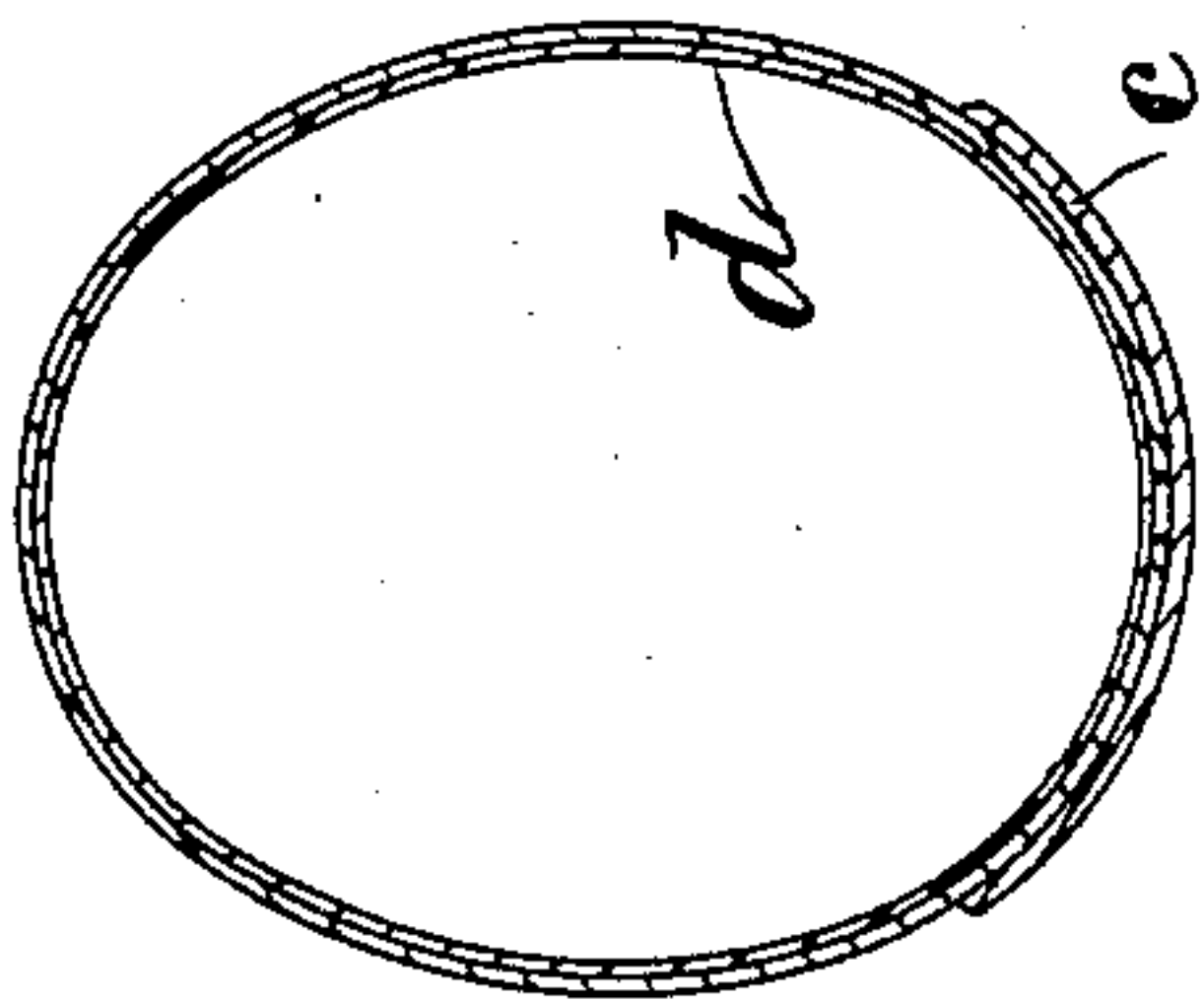


FIG. 4

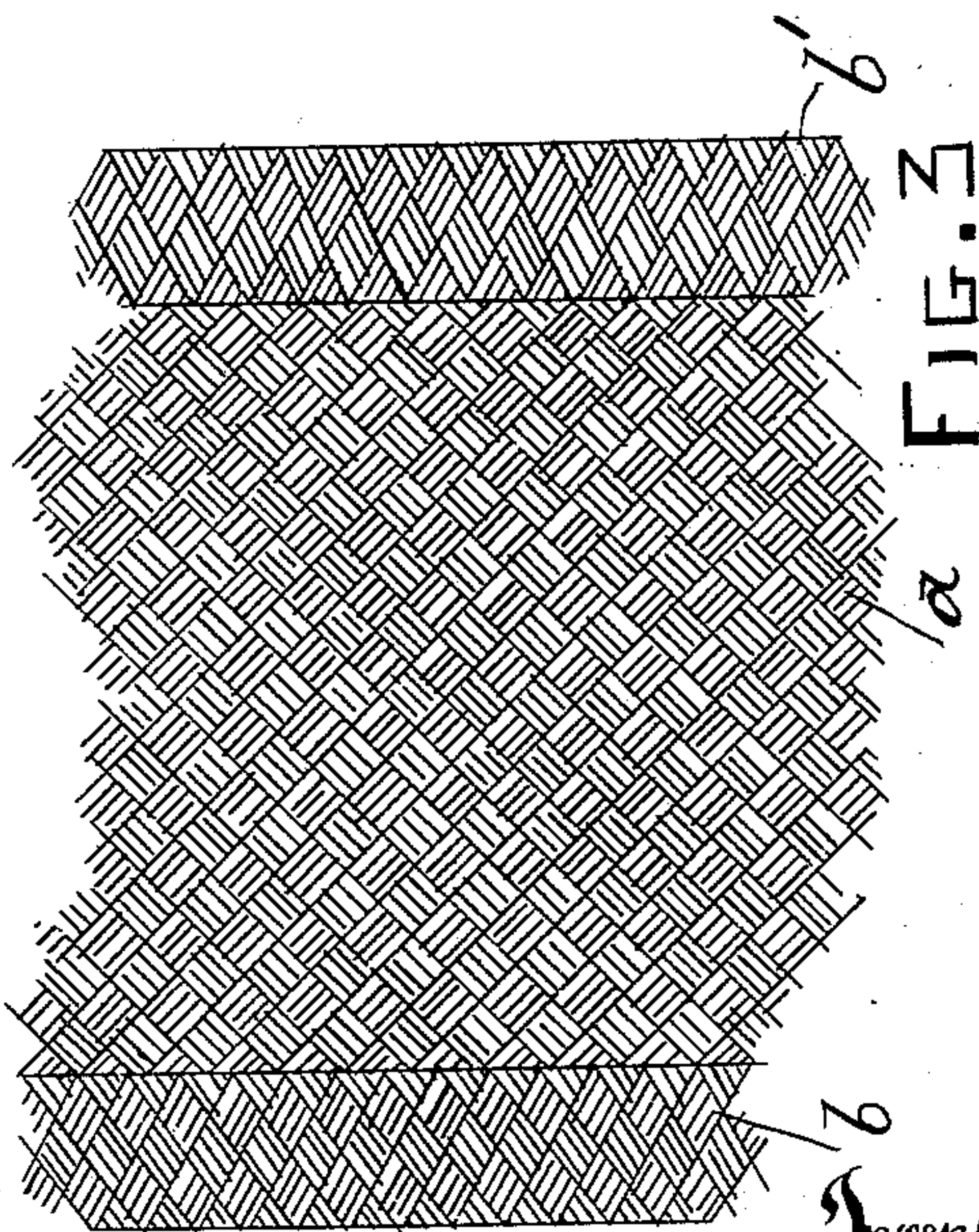


FIG. 3

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UNITED STATES PATENT OFFICE.

WALTER SWAIN AND LEONARD HARTLEY SWAIN, OF BOLTON, ENGLAND.

TIRE FOR WHEELS OF ROAD-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 638,605, dated December 5, 1899.

Application filed December 23, 1898. Serial No. 700,183. (No model.)

To all whom it may concern:

Be it known that we, WALTER SWAIN and LEONARD HARTLEY SWAIN, subjects of the Queen of Great Britain, residing at 177 Belmont road, Astley Bridge, Bolton, in the county of Lancaster, England, have invented a new and useful Improvement in Inflatable Tires for the Wheels of Road-Vehicles, of which the following description is a specification.

Our invention relates to inflatable tires for the wheels of road-vehicles, and has for its object the production of said tires in such a manner and of such a nature that when the same are deflated they may be readily applied to the rims of the wheels upon which they are to be mounted, while when they are mounted thereon and inflated they will firmly grip or lay hold of said rims, so as to be thereby enabled to perform the functions desired of them efficiently.

In the accompanying sheet of drawings, which are illustrative of our invention, Figures 1 and 2 are sectional end elevations showing the form assumed by certain of the parts hereinafter described when the tire is inflated. Figs. 3 and 4 are diagrams illustrating certain methods of production hereinafter described.

In carrying our invention into effect we make use of the india-rubber-covered fabric to form the outer surface or walls of the tire, of and in the well-known kind and manner, with the exception that we produce or construct the fabric or canvas part of said outer cover of such a nature that when drawn or pulled longitudinally it will extend in that direction, but at such time it will become narrower, while when it is drawn or pulled laterally or transversely, so as to have its width increased, it will be made shorter, at any time the elasticity of the india-rubber enabling this latter to accommodate itself to the varying dimensions of said fabric, as is well understood. In producing said canvas we arrange the interwoven or interlaced threads *a* so that they are approximately evenly distributed throughout the fabric whether such fabric or canvas is woven or braided. The latter process being the more preferable, therefore it is the one alone illustrated. We further form said canvas so that those of its

component threads (which may be of fibrous substances or of metal wire) which are employed to form the edges *b b'* are not carried over as large a lateral space as are the threads *a*, the relative dimensions of the spaces they extend over being somewhat approximately indicated by Fig. 4, by which means the central part *a* of the canvas may be varied in length or width by pulling or drawing to a greater extent than will the edges or bordering parts *b b'*. Thus when strips of canvas, formed as described, are joined together and their outer ends are secured to each other (on which the covering of india-rubber is placed over and caused to adhere by any suitable adhesive substance to these canvas parts) they may be placed over wheel-rims *c* to cover inner tubes *d*, which on being inflated will draw or distend same to fit within the hollows of said rims *c*, and that the more said inflating-tubes *d* press upon them the more tightly and firmly will they press upon the rims, since the lateral strains on said canvas parts *b b'* will tend to diminish their lengths and so bring them to bear firmly against the rim *c*, which counteract or withstand such contractions of the canvas.

We may either produce both the central part *a* and the bordering parts *b b'* in one part by the process of interlocking their several respective threads during and by the braiding operations or we may produce them in separate pieces and afterward sew, stitch, or otherwise secure them together; but whether the one or the other of these processes is followed during its being actually carried into effect we arrange the parts *b b'* to be at a greater tension longitudinally than are those forming the central part *a* of same, while at such time we have these said centrally-situated threads *a* held or drawn laterally, by which means when the canvas thus produced is brought into use by being distended from within its central part *a* is caused so to act upon its edges *b b'* that the whole firmly grips the rim.

To produce tires of other shapes than circular in cross-section, it is only necessary to make the canvas parts in several sections instead of in only three, as above set forth, such as the one shown by Fig. 4, in which there are five sections *a*, *b b'*, and *b² b³*, each

section being held at the necessary tension (in which it varies from that of its neighbor) during the time it is being secured to the others, as above described.

5 Coverings made of canvas produced as above described may be employed in connection with inner inflating-tubes, as shown by Fig. 1, or by having their edges *b b'* arranged to overlap each other on the rim *c* they may
10 be used without such inner tube, or, again, more than one of such coverings may be used in the production of a single inflated tire, in which case they would be placed one over or upon another.

15 Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

20 1. The method of manufacturing bicycle-tires, which consists in forming separate tread and edge sections, and holding said tread-section

tion at a different tension from said edge-sections while the latter are being united to the former, substantially as set forth.

2. A bicycle-tire comprising a central tread-section, and separate edge-sections, all of which are formed by the process of braiding, and means for uniting said sections while under different tensions, substantially as and for the purpose set forth. 25 30

3. A bicycle-tire comprising a central tread-section, and a plurality of edge-sections of different degrees of elasticity, and means for uniting all of said sections while under different tensions, substantially as and for the purpose set forth. 35

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