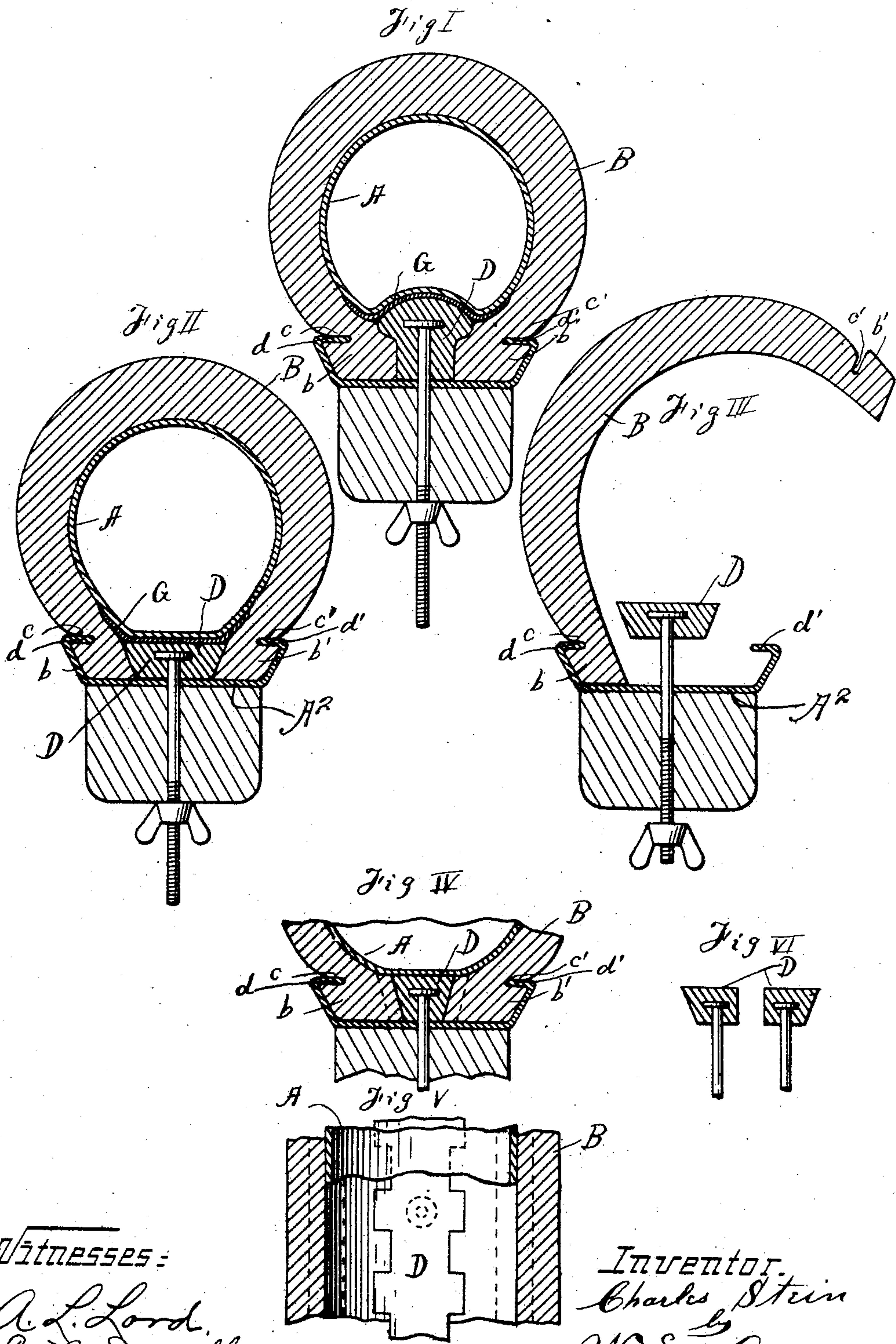


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C. STEIN.
VEHICLE TIRE.
APPLICATION FILED OCT. 5, 1903.



Witnesses:

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VEHICLE-TIRE.

SPECIFICATION forming part of Letters Patent No. 779,505, dated January 10, 1905.

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To all whom it may concern:

Be it known that I, CHARLES STEIN, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Vehicle-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 pertains to make and use the same.

My invention relates to pneumatic tires, and has reference to such as employ an inner inflatable tube and an outer inclosing and protecting shoe.

The objects of my invention are, first, the securing of the shoe to the wheel-rim in such a manner that the shoe cannot be cut or abraded at its clamped portion or at that portion located at its inner periphery which is inclosed within pockets.

Another object of my invention is to secure the shoe by a mechanical means within the retaining-pockets and to the rim of the wheel by expanding the open or free end outwardly or laterally into the channel after the inner tube is in place.

My invention consists in constructive features and in details of construction whereby the above objects are attained, all of which will be hereinafter fully set forth and claimed.

In the drawings, Figure I is a sectional view illustrating one method by which my objects are attained. In this figure I illustrate the expanding means as forming a buffer extending outwardly from the axis of the wheel and into the recess of the shoe, thus preventing injury to the inner tube and shoe and also preventing accidents through the deflating of the inner tube. Fig. II illustrates a modified form of construction in which a buffer is not employed. Fig. III illustrates the shoe when detached at one side from the rim. Figs. IV and V illustrate the expanding mechanism as employed to lock the shoe to the rim and against creeping around on said rim. Fig. VI illustrates a modified form of expanding and locking device in which the same is formed in two parts.

A represents the inner tube, which is inflatable and air-tight.

B represents the protecting and inclosing shoe. This inclosing or protecting shoe B is formed at its inner periphery, as illustrated, with laterally-projecting annular beads *b b'*, which in cross-section may be of the form shown or of any other suitable form. These beads *b b'* are adapted to fit pockets carried by the flat body portion of a supporting means *A*². The pockets conform with the lateral beads in such a manner that when both are engaged the shoe will tightly hug the wheel-rim and also the pockets. In this connection I would call attention to an important feature, viz: It will be noticed by referring to the drawings that the laterally-extending flanges of the pockets are received within apertures formed by the upper surface of the beads and a portion of the body of the shoe, as illustrated at *c c'*. These apertures or grooves have straight parallel side walls, thus causing the inner periphery of the shoe at this point to rest upon and be supported by the lateral flanges *d d'*, the object being to prevent the shoe from cutting or abrading.

In order to secure the shoe to the rim, I employ a lock D, which is so constructed that when it is drawn between the opposing edges of the shoe when the same is in place within the rim it will expand the opposing or contiguous edges outwardly, thus causing the beads *b b'* to be snugly housed within the pockets *C C'* of the rim. The action, as just above stated, at the same time draws the shoe securely to the rim at its outer periphery, thus locking it in place in such a manner that whether the inner tube is inflated or deflated it will be impossible for the shoe to become detached.

In order to secure the shoe against creeping on the outer periphery of the rim, I have illustrated in Figs. IV and V a locking mechanism comprising a wedge-shaped piece having alternating projections and pockets and have illustrated the shoe so formed at the free edges as to fit or conform to this shape. I have also illustrated in the drawings in Fig.

VI the locking mechanism formed in two parts, and in all of the figures I have illustrated bolts whereby the locking mechanism may be drawn into position. These bolts pass
5 through the rim and engage the locking device and are preferably drawn in position by suitable nuts, a thumb-nut being preferred.

In the drawings I have illustrated the locking mechanism in Fig. I as being provided
10 with a head and buffer and in Figs. II, III, IV, and VI as being wedge-shaped in cross-section; but this is not absolutely essential by my preferred method of construction, inasmuch as these locking portions may be paral-
15 lel at their sides or practically rectangular in cross-section, the only necessary function of this part being to hold the free edges of the shoe in position and to lock them when thus secured or engaged.

In Figs. I and II, I have illustrated what I term a "protector" G, the same being inter-
posed between the inner tube and the shoe and locking mechanism overlapping the joints be-
tween these two parts and preventing injury or
25 pinching of the inner tube. This protector G may be formed of a separate piece or may be vulcanized to or formed with the locking mechanism, as found necessary or desirable.

By a construction as above set forth it will
30 be seen that the outer shoe is very firmly seated or secured to the rim both when the tire is inflated and when it is deflated, that it is impossible for the same to creep or move out of place upon the rim of the wheel, and
35 that it is impossible for the shoe to cut in ordinary use at that portion where it engages the pockets of the rim.

In setting forth this invention I have shown and described certain details of my invention
40 and assemblage of parts as I find them best adapted to perform their required function, and I have also shown modifications adapted for the same purpose; but I do not wish to be limited to either the features or assemblages
45 as set forth and described, inasmuch as they may be modified and probably will be modified.

What I claim is—

1. A wheel-rim and tire comprising a protecting-shoe, provided at its inner periphery 50 with beads and having free edges, a locking device provided at its engaging edges with projections and depressions adapted to engage the free edges of the shoe, with means for se-
curing said locking device in position, and 55 pockets for receiving the beads, substantially as set forth.

2. In combination with a rim, a tire comprising an inner inflatable tube, and an outer shoe provided with lateral beads at the free 60 edges thereof, means carried by said rim for receiving said beads, a locking means interposed between the free edges of said shoe, and an adjusting-bolt projecting through said rim and first-named means and having its 65 head embedded in said locking means.

3. In combination with a rim, a tire comprising an inner inflatable tube and an outer shoe having free edges, the exterior of the shoe adjacent said free edges being tapered 70 and formed with grooves having straight parallel side walls, a supporting means carried by the rim embracing the free portions of the shoe and having lateral flanges arranged in said grooves, a locking means arranged be- 75 tween the free portions, and means for securing said supporting and locking means respectively in position.

4. In a tire, a shoe having free portions the exterior of which is tapered inwardly toward 80 the edges thereof, and said exterior tapered portions being formed with grooves having parallel straight side walls, in combination with a rim and pockets mounted thereon and receiving said free portions, said pockets em- 85 bodying laterally-projecting flanges received in said grooves.

Signed at Cleveland, in the county of Cuyahoga and State of Ohio, this 24th day of September, 1903.

CHARLES STEIN.

Witnesses:

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