

(No Model.)

L. K. McClymonds.
PNEUMATIC TIRE.

No. 567,993.

Patented Sept. 22, 1896.

Fig. 1.

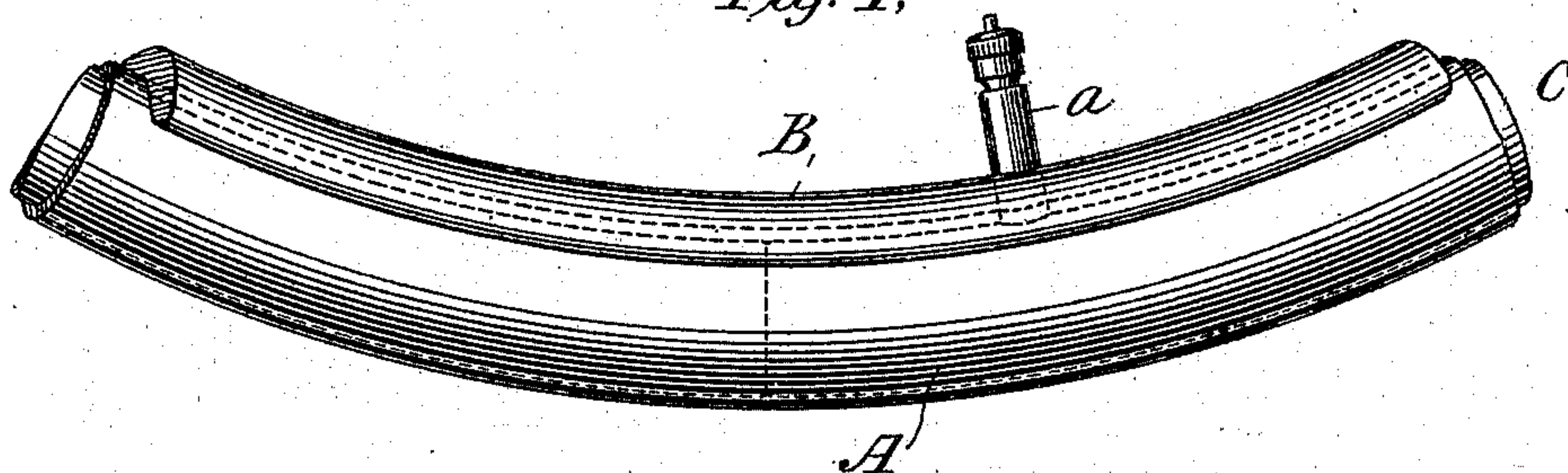


Fig. 2.

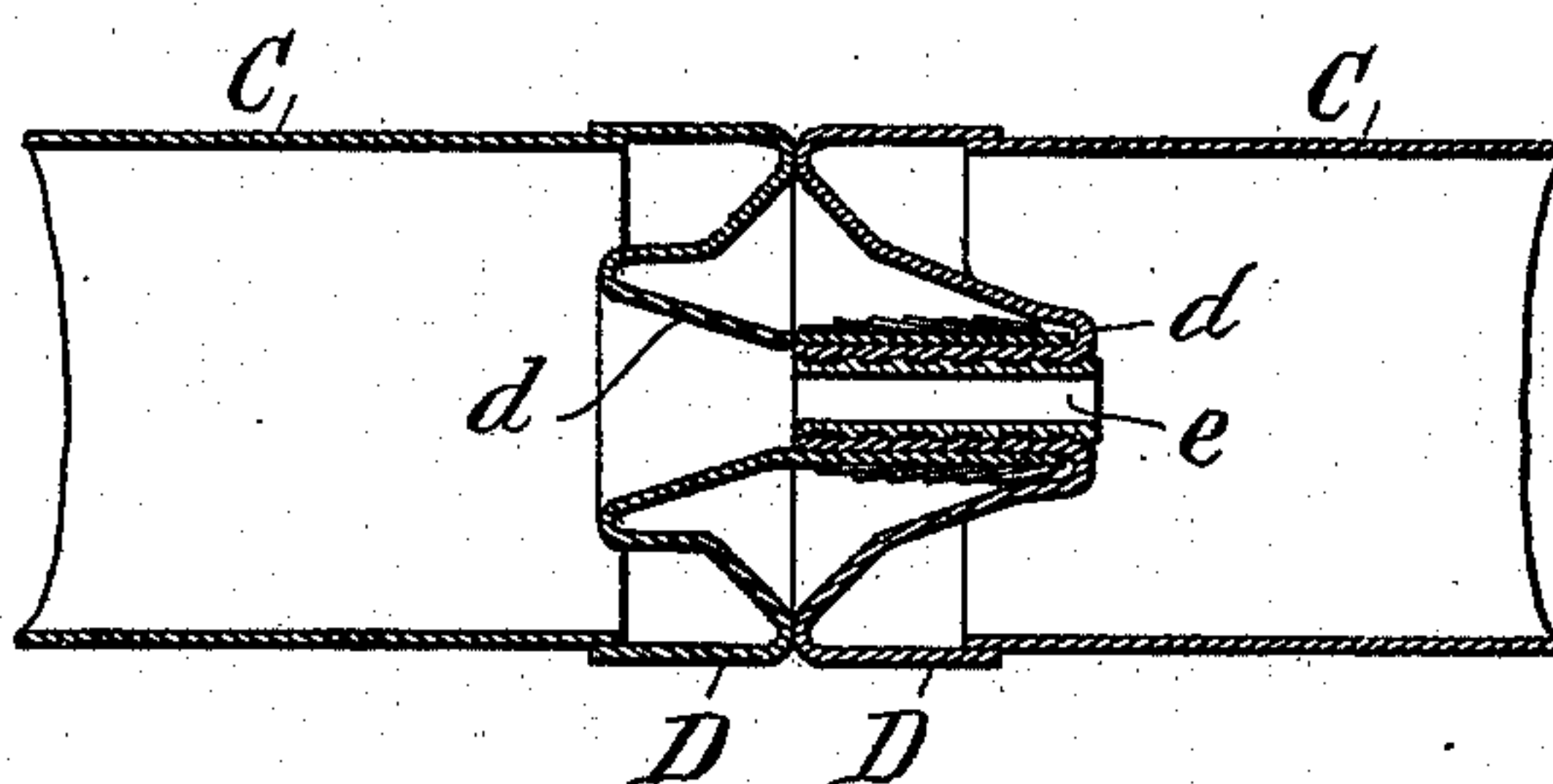
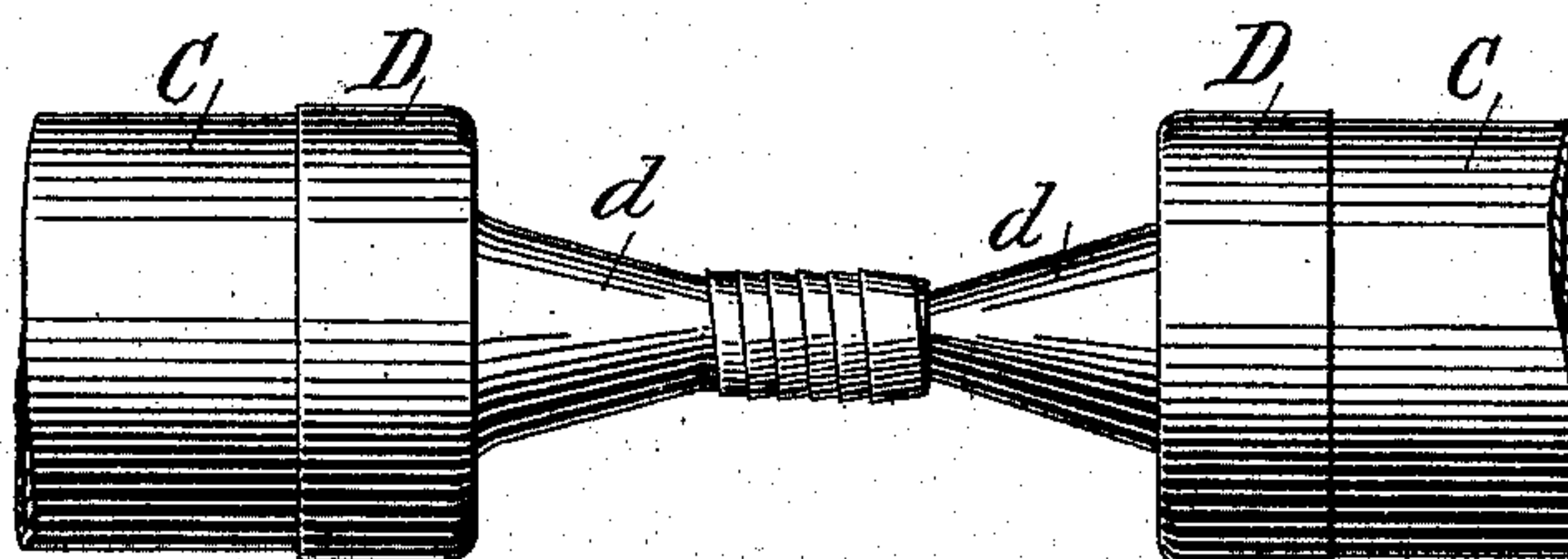


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

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PNEUMATIC TIRE.

SPECIFICATION forming part of Letters Patent No. 567,993, dated September 22, 1896.

Application filed December 7, 1895. Serial No. 571,398. (No model.)

To all whom it may concern:

Be it known that I, LOUIS K. McCLYMONDS, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Pneumatic Tires, of which the following is a specification.

In the class of pneumatic tires known as "inner-tube" tires there is an outer endless tube or shoe slit longitudinally for a short distance at one or more places in the face that lies against the felly to permit of the insertion and withdrawal of the inner air-tube, the slit or slits being usually laced up when the air-tube is in position.

Heretofore the air-tubes of such tires have been made with two closed or sealed ends that have been formed either by cementing or vulcanizing closing-caps on the ends or by pinching the ends of the tube flat and cementing or vulcanizing the flat faces together; but, however formed, the air-tube has had closed ends and has not had a continuous annular bore when in position within the shoe. At least two serious objections or defects exist in such tires.

First. When the tire is inflated and the wheel in use, as the pressure at the tread is transferred by the revolution of the wheel toward the closed end of the inner tube the effect is to bank or accumulate the air under an increasing pressure in the closed end of the tube, thus subjecting that end of the tube to an abnormal strain and forming an air lump or wedge that is appreciable to the rider and objectionable. Experience has shown that the air-tubes of such tires give out at the closed ends, and this is evidently because of the behavior of the contained air above referred to.

Second. In removing the air-tube from the enveloping shoe of such tire the inflation-valve is opened, the slit in the shoe unlaced, and the air-tube withdrawn by seizing one end of it. It is impossible, however, to expel all the air from the inner tube, and in drawing the tube out the air therein is gradually forced back to the closed end of the tube and distends it into contact with the interior walls of the shoe, thus creating con-

siderable friction and rendering necessary a careful manipulation of the tire to avoid injury of the inner tube by an excessive strain thereon. In uncareful or unskilful hands the air-tube is, in fact, frequently seriously injured in this way.

My invention is designed to overcome these objections, existing in all inner-tube tires as heretofore made; and it consists in providing an inflatable flexible inner air-tube composed of a single length of tubing whose ends are open and may be connected and disconnected, after it is drawn into the shoe, and which has a continuous annular bore or air-chamber when its ends are so connected. This result may be accomplished in a variety of ways.

In the accompanying drawings I have shown a way of constructing the air-tube and connecting and disconnecting its ends which I consider the best now known to me and which I have demonstrated by use to be a practical, economical, and efficient way of carrying out my invention.

Figure 1 is a side elevation of a portion of a felly and pneumatic tire embodying my invention; Fig. 2, a longitudinal central section showing the ends of the air-tube united and connected by an air-passage, and Fig. 3 a side elevation of the united ends of the air-tube.

The felly A, air-valve *a*, connected with the inner air-tube, and shoe B may be of usual construction and do not require description. The inner inflatable air-tube C is also of usual construction, except at the ends. Each end is formed with, or has cemented or vulcanized to it, a cap D, having a nipple or tubular projection *d*. The nipple of one cap has an interior diameter equal to or very slightly greater than the exterior diameter of the other nipple, so that one may be slipped within the other. The smaller nipple is either made sufficiently hard or is bushed with a short tube *e*, whose exterior surface is preferably grooved, ribbed, or corrugated circumferentially to insure its retention. One nipple having been slipped within the other, a wrapping of cord or "friction-tape" may be applied, as in Fig. 3, the air-tube, however, having been drawn into the shoe. The slit

in the shoe may then be laced and the tire inflated. The pressure of the air brings the caps D together, and their respective nipples cause the countersinking of the caps, as indicated in Fig. 2. The overlapping portions of the nipples will seek a position to the right of the line of abutment of the caps, or to the left, or symmetrically in the center. This is a matter of chance and is immaterial. In this construction the interiors of the ends of the air-tube are connected by an air-passage whose exterior walls are of less diameter than the diameter of the body of the air-tube, and hence the pressure of a stiff bushing *e* cannot be felt when the tire is inflated, nor is it possible to perceive on the outer surface of the shoe the line of abutment of the caps D.

With this tire there is a continuous annular air-passage in the air-tube, and hence objectionable banking or wedging of the air does not occur when the wheel is in use; and in removing the air-tube from the shoe, the ends of the shoe being open, no accumulation of air in the end of the tube can occur.

I claim as my invention—

1. An inflatable flexible inner air-tube consisting of a single length of tubing for pneumatic tires, having open ends, means for uniting the ends and leaving an air-passage connecting them, and an air-valve for inflating the air-tube.

2. In an inner-tube tire, the combination of the shoe, and an inner inflatable flexible air-tube consisting of a single length of tubing having open ends, and means for connecting the ends to form a continuous annular air-tube with a continuous annular air-chamber.

3. An air-tube for a pneumatic tire, having normally open ends formed by caps having nipples, one of which may be placed within the other, whereby the air-tube may be brought into annular form with a continuous annular air-chamber.

4. In an inner-tube tire, the combination with the shoe, of the inner air-tube having open ends provided with caps having nipples, one of which may be placed within the other, whereby the air-tube may be brought into

annular form within the shoe, and have a continuous air-chamber.

5. In an inner-tube tire, the combination of the shoe and an inflatable flexible air-tube consisting of a single length of tubing open at the ends, the openings being formed by outlets of less diameter than the diameter of the body of the tube, and means whereby the end portions containing such openings of reduced diameter may be united to bring the tire into annular form with a continuous annular air-chamber therein.

6. In an inner-tube tire, the combination of the shoe and the inner air-tube having open ends formed by nipples of less diameter than the diameter of the tube, one of said nipples being relatively hard or rigid, and capable of being placed within the other nipple, whereby the air-tube may be brought into annular form with a continuous annular air-chamber.

7. In an inner-tube tire, the combination of the shoe and the inner flexible inflatable air-tube, consisting of a single length of tubing having open ends, and means for connecting the ends to bring the tire into annular form with a continuous air-passage therein.

8. An inflatable flexible air-tube for a pneumatic tire, consisting of a single length of tubing having normally open ends formed by caps having nipples that may be united, whereby the air-tube may be brought into annular form with a continuous annular air-chamber, in combination with the inclosing shoe.

9. In an inner-tube tire, the combination of the inclosing shoe and an inflatable flexible air-tube consisting of a single length of tubing having contiguous separable ends with an air-passage connecting the interior spaces of the two ends, and an air-valve for inflating the inner tube.

In testimony whereof I have hereunto subscribed my name.

L. K. McClymonds.

Witnesses:

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