(No Model.)

W. A. WARREN.

PNEUMATIC TIRE.

No. 491,620. Patented Feb. 14, 1893.

Fig. 1.

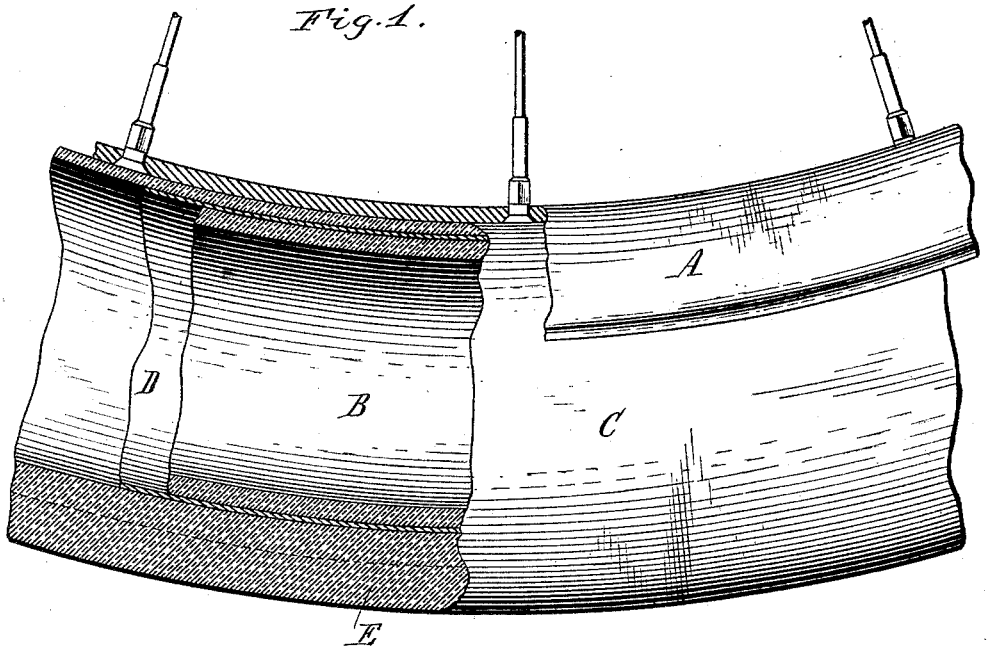
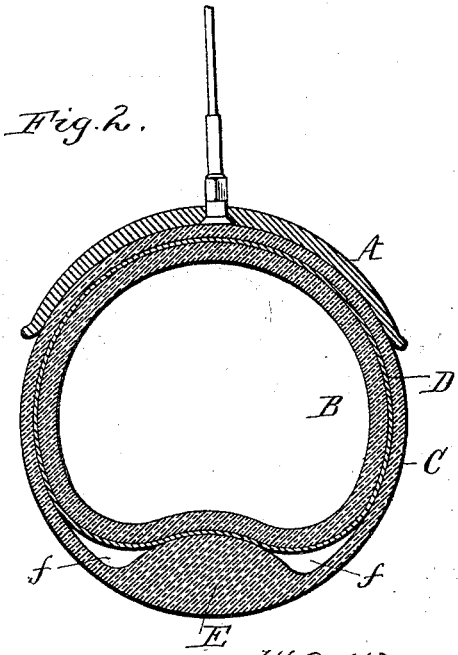


Fig. 2.



Witnesses:
Emil Neuhart
Chas. F. Burkhardt

W. A. Warren Inventor.
By Wilhelm & Bonnet
Attorneys

UNITED STATES PATENT OFFICE.

WILLARD A. WARREN, OF BUFFALO, NEW YORK.

PNEUMATIC TIRE.

SPECIFICATION forming part of Letters Patent No. 491,620, dated February 14, 1893.

Application filed October 24, 1892. Serial No. 449,760. (No model.)

To all whom it may concern:

Be it known that I, WILLARD A. WARREN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Pneumatic Tires, of which the following is a specification.

This invention relates to that class of pneumatic tires for velocipede wheels which comprise essentially an inner inflatable air tube and a protecting envelope or covering which incloses the air tube.

The object of my invention is to lessen, by simple means, the liability of puncturing the air tube in case the surrounding envelope is cut or punctured by passing over a sharp stone or other object.

In the accompanying drawings:—Figure 1 is a side elevation, partly in section, of a portion of a velocipede-wheel provided with my improved tire. Fig. 2 is a cross section thereof.

Like letters of reference refer to like parts in both figures.

A represents the usual concave rim in which the tire is seated and to which the outer ends of the spokes are secured by any ordinary means.

B is the inner air tube, preferably constructed of rubber, C the protective envelope, constructed of rubber, leather or any other flexible material possessing the requisite strength, and D the customary covering of canvas or other flexible material interposed between the air tube and its envelope. The envelope is provided on its inner side opposite its tread or outer portion with a raised longitudinal rib or ridge E which projects inwardly beyond the inner surface of the envelope and extends continuously around the same. This ridge bears centrally against the adjacent outer or lower side of the air tube and raises the same out of contact with the inner surface of the envelope, forming spaces or recesses *f* between the air tube and the envelope on opposite sides of the ridge when the tube is inflated, as shown in Fig. 2. By thus isolating from the envelope the lower portion of the air tube, the danger of a sharp stone or other object reaching the air tube and puncturing it, after having cut through the envelope, is practically obviated. The lower portion of the air tube between the isolating spaces *f* is protected by the thick ridge of the envelope. This ridge is preferably formed integrally with the envelope and its crown is rounded, as shown, so as not to cut into the tube.

Instead of forming the internal ridge on the envelope, the arrangement may be reversed by forming the rib on the air tube, so as to bear with its crown against the contiguous inner side of the envelope, by which arrangement the same result of separating the lower side of the air tube from the tread portion of the envelope by intervening spaces on both sides of the ridge is obtained.

I claim as my invention:—

The combination with the protective envelope of the tire adapted to bear against the wheel rim, and provided on its inner side, opposite its tread, with a raised rib or ridge, of a separate inflatable tube arranged within said envelope and bearing with its side portions against the adjacent inner wall of the envelope and resting with its outer side centrally upon said rib or ridge, whereby the contiguous portion of the tube is indented and spaces or recesses are formed on opposite sides of said ridge which separate the tube from the envelope, substantially as set forth.

Witness my hand this 22d day of October, 1892.

WILLARD A. WARREN.

Witnesses:
JNO. J. BONNER,
FRED. C. GEYER.