

(No Model.)

A. L. SMITH.
PUNCTURE PROOF TIRE.

No. 556,379.

Patented Mar. 17, 1896.

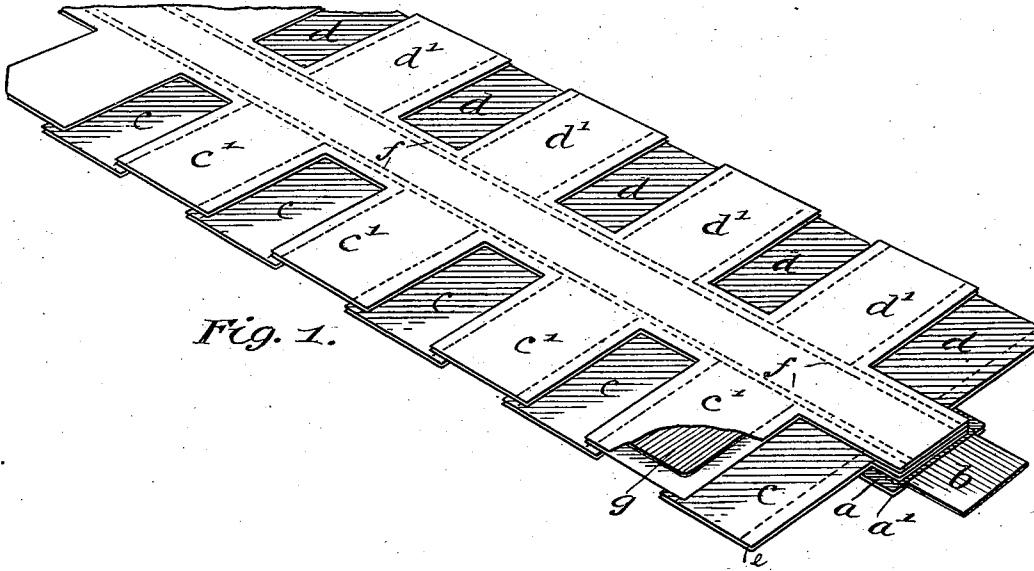


Fig. 1.

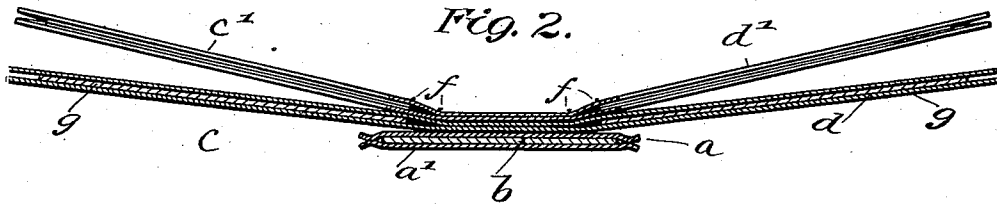
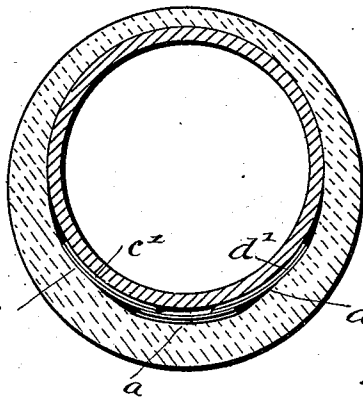


Fig. 2.

Fig. 3.



WITNESSES:

Frank S. Ober
John Kraeger

INVENTOR,

Abram L. Smith
BY
Wm. A. Rosubany
ATTORNEY

UNITED STATES PATENT OFFICE.

ABRAM L. SMITH, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE LONG ISLAND RUBBER AND CYCLE COMPANY.

PUNCTURE-PROOF TIRE.

SPECIFICATION forming part of Letters Patent No. 556,379, dated March 17, 1896.

Application filed November 11, 1895. Serial No. 568,568. (No model.)

To all whom it may concern:

Be it known that I, ABRAM L. SMITH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Puncture-Proof Tires, of which the following is a full, clear, and exact description.

This invention relates to devices for preventing the air-tube in wheel-tires from becoming punctured by sharp bodies, such as tacks or pieces of glass, which are liable to come in contact with the tire on ordinary roads.

Devices of this character have been heretofore proposed, but my object is to construct a band or strip adapted to be inserted between the outer and inner tubes of the tire and either left free or attached to one of said tubes, and of such construction that it will not to any appreciable extent detract from the sensitiveness or liveliness of the tire, and which will be very light and efficient for the purpose intended.

The invention consists of a strip or band consisting essentially of a backbone upon the opposite edges of which are arranged a plurality of rows of flat ribs overlapping each other and the backbone in a peculiar manner. These lateral ribs are hinged to the backbone, and those on one side are separate and distinct from those on the other. The backbone is formed of a strip of thin metal inclosed in a sheathing of textile material, and the ribs are also of metal and in the form of small plates, which are inclosed in a sheath or envelope of textile material. The parts are preferably stitched together, the lines of stitching determining the boundaries of the envelopes or pockets in which the strips of metal are inclosed, and also determining the lines along which the bending occurs or where the hinges are located.

The invention will be described in detail with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of the puncture-proof strip constituting my invention. Fig. 2 is a cross-section of the same on a large scale; and Fig. 3 is a cross-section of a tire,

showing the location of a strip when properly placed therein.

The strip is formed with a backbone consisting of two layers of cloth or other suitable flexible material *a a'*, the edges of which are sewed together to form an elongated envelope or pocket, in which is placed one or more continuous flat bands of metal *b*.

Upon the inner or concave side of the backbone are arranged four rows of lateral ribs *c c'* and *d d'*, two on each side, the ribs *c'* resting against the ribs *c* and overlapping the adjacent edges of the ribs *c*. The ribs *d'* are similarly arranged with respect to the ribs *d*. The inner ends of all the ribs overlap the lateral edges of the backbone. The ribs consist of small sheets of metal inclosed in a pocket made preferably in the following manner: The pockets of the ribs *c'* and *d'* are formed by cutting out two pieces of cloth or other suitable material in the shape shown—that is, with a central strip, from which extend laterally on each side the rectangular teeth, giving shape to the ribs. These two pieces are placed together and the teeth are stitched down the edges, as indicated at *e*. Two other pieces of cloth are cut and stitched together in exactly the same way for the ribs *c* and *d*. Then the two sets of ribs are placed together so that their central portions will be coincident, and the lateral envelopes or pockets *c'* and *d'* will respectively rest over the spaces between the pockets *c* and *d*. Both strips are then placed centrally against the backbone and stitched along the lines *f f* or otherwise secured to the inner covering of the backbone. I then place in each of the pockets or envelopes *c c'* and *d d'* a flat rectangular sheet of metal *g*, which is pushed inward until it is stopped by the lines of stitching *f*, and the outer ends of the ribs may then be closed if desired.

It will be observed that the lines of stitching *f* are well inside of the edges of the backbone, so that the strips of metal in the ribs will overlap the backbone. This method of stitching forms a hinge at the inner end or base of each rib, upon which the rib is perfectly free to turn.

The strip so completed may be placed inside of the wheel-tire between the air-tube and the

projecting sheathing or main tire, as indicated in Fig. 3, or it may be located on the outside against the tread of the sheathing and secured in any suitable manner. The width of the strip will be about sufficient to cover one-half of the inner tube. It will be observed that by this method of hinging the ribs to the backbone and overlapping them the strip will not interfere to any appreciable extent with the resiliency or liveliness of the tire to which it is applied. This result is brought about largely because the puncture-proof filling in the ribs along one side of the backbone is entirely disconnected from that on the other side, thus permitting of the most universal movement of the ribs.

I do not confine myself to any particular puncture-proof material for the ribs and backbone, as the main feature of my invention is the construction; but I prefer to use sheets of aluminum for the pockets and ribs, as that is hard, tough, and light; but obviously other metals and materials, such as celluloid or papier-maché, may be used if desired. Neither do I limit myself to the particular way of forming the pockets for the several pieces of metal. The covering for each rib may be entirely distinct from that of the others and attached to the backbone in any manner to produce the hinge described. If feasible, also, the rib and the backbone, either or both, may

be entirely bare, the envelopes or pockets being dispensed with so long as the ribs are hinged to the backbone and overlap one another in the manner described.

Having thus described my invention, I claim—

1. A puncture-proof strip for pneumatic tires, consisting of a backbone in combination with ribs projecting laterally from each edge, the ribs being hinged to the backbone, substantially as described.

2. A puncture-proof strip for pneumatic tires, consisting of a backbone in combination with two or more series of ribs projecting laterally from each edge thereof, said ribs overlapping each other and the backbone and being hinged to the backbone, substantially as described.

3. A puncture-proof strip for pneumatic tires, consisting of a backbone in combination with ribs projecting laterally from each edge, the said backbone and ribs being inclosed in pockets or envelopes of flexible material which are hinged together as set forth.

In testimony whereof I subscribe my signature in presence of two witnesses.

ABRAM L. SMITH.

Witnesses:

FRANK S. OBER,
JOHN KRAEGER.