

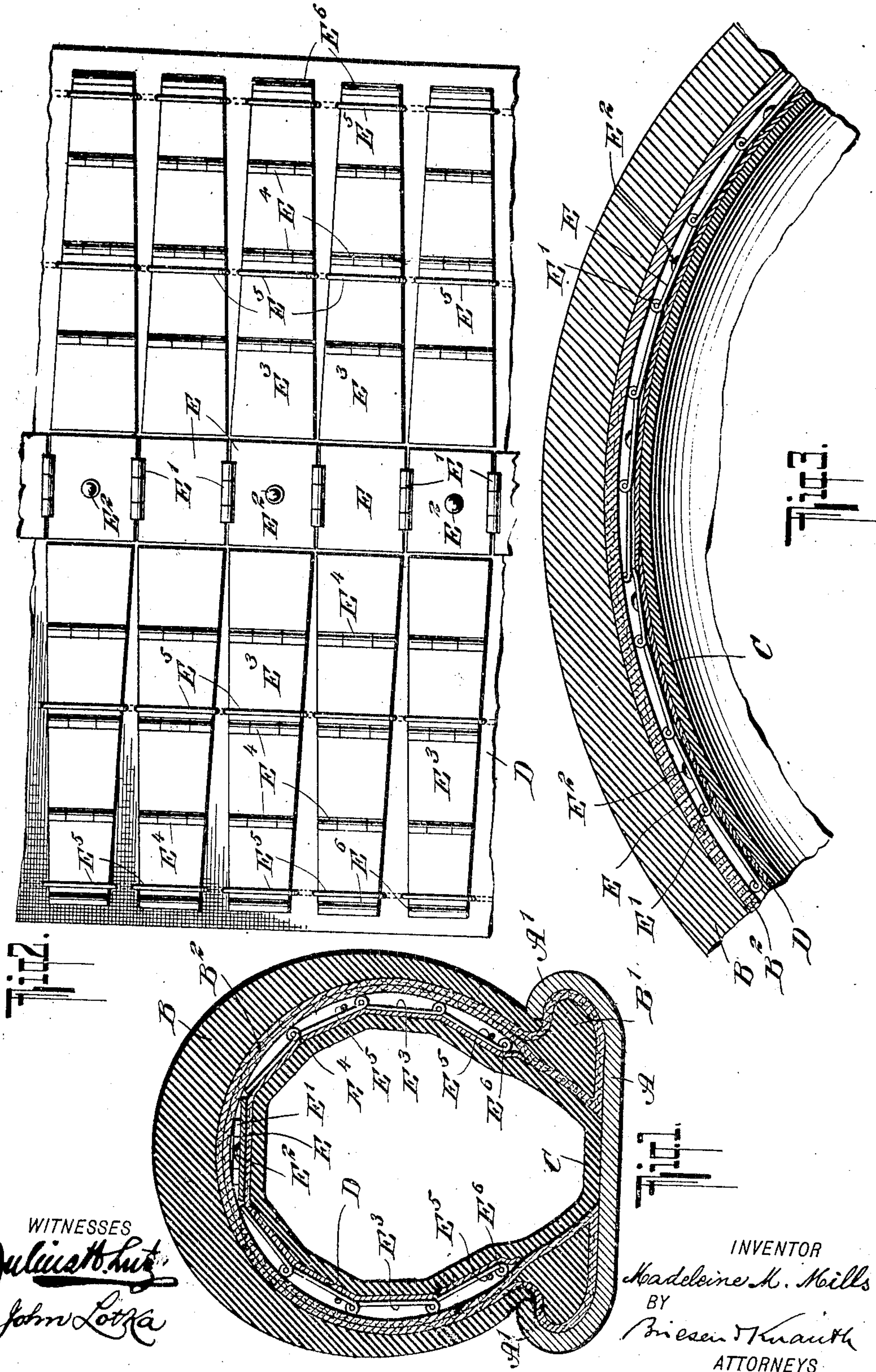
No. 871,768.

PATENTED NOV. 19, 1907.

M. M. MILLS.

TIRE.

APPLICATION FILED SEPT. 28, 1908.



WITNESSES

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TIRE.

No. 871,763.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed September 28, 1906. Serial No. 336,593.

To all whom it may concern:

Be it known that I, MADELEINE MERLI MILLS, a citizen of the United States, and a resident of Kingsbridge, in the borough of Bronx, city, county, and State of New York, have invented certain new and useful Improvements in Tires, of which the following is a specification.

My invention relates to tires, and particularly pneumatic tires such as are used for automobiles, and has for its object to provide an improved protector to be applied either between the air tube and the shoe of a double tube tire, or to either the inner or the outer surface of a single tube tire. This protector will prevent the puncture of the tire, and will even render it bullet-proof, if made of sufficient thickness.

Reference is to be had to the accompanying drawing, in which

Figure 1 is a cross section of a rim, a double tube tire applied thereto and one of my improved protectors in position; Fig. 2 is a plan showing a portion of the protector spread out; and Fig. 3 is a longitudinal section through a portion of the tire and protector.

A is the rim having inwardly turned flanges A', which form hooks for holding the lugs B' on the outer case or shoe B, which forms the tread of the tire. This shoe has its inner surface made with a layer B² of canvas or similar fabric, and contains the inflatable air tube C. Between this air tube and the shoe is interposed the protector comprising a layer D of canvas or like material, which is placed in contact with the air tube C, and a large number of metal plates. Some of these metal plates E extend lengthwise of the canvas strip D at the center thereof, and are hinged to each other, as indicated at E', forming what may be called the backbone of the protector. They are secured to the layer of canvas or like material in any suitable manner, for instance by rivets E². Adjacent to each of the plates E, at the sides thereof, are strips of hinged plates E³, connected with each other at E⁴ by hinges running lengthwise of the canvas D, and secured to said canvas in any suitable manner, for instance by being stitched thereto at E⁵. In the particular construction shown, there is no direct connection between the backbone formed by the plates E, and the side strips formed by the plates E³, although if desired such a direct connection

might be provided by means of hinges similar to those designated as E⁴. The width of the plates E³ preferably decreases toward the edges of the strip D, so that they may be placed close together when the protector is bent into the proper shape, as indicated in Fig. 1. Obviously, the diameter of the protector is greatest at the backbone, and least at the edges. Hence, the necessity for the tapered construction will be understood. This feature has, however, been exaggerated in the drawing for the sake of clearness. The edges of the plates E³ nearest to the edges of the strip D, are preferably rolled or curled, as shown at E⁶, so that they may not cut into the tire fabric.

It will be seen that the metal parts of the protector do not engage the rubber, either of the shoe or of the inner tube, and thus I avoid any detrimental effect which metal might have on rubber. Fig. 1 also shows that there is a slight space between the portion of the fabric layer B² nearest to the tread of the tire, and the adjacent portion of the backbone of the protector. Thus, when the tire is flattened at the point where it touches the ground, it simply conforms more closely to the shape of the backbone.

It will also be seen in Fig. 1 that the metallic part of the protector is extended inward to a point practically opposite the curved edges A' of the rim, so that there is no point at which a nail or other sharp object could puncture the tire without coming against a metallic surface, which would stop its further progress. The innermost portion of the tire is protected by the rim, and the portion from the rim outward to the tread, is protected by the metal plates E, E³. The length of the canvas or other strip D should be slightly greater than the inner periphery of the tire, and the length of the backbone should also be slightly in excess of the tire length. The ends of the strip D, and of the backbone will therefore overlap as shown in Fig. 3, and this will not only allow for slight differences in the length of tires and protectors, but will also allow the protector to yield slightly lengthwise of the tire, corresponding to its greater or smaller degree of inflation, and to the compression of the tire due to the traveling of the vehicle and the effect of stones or other obstacles.

The protector strip will support itself within the tire even before the inner tube C is inflated, the stiffness of the metal parts,

and the shape of the shoe B being such as to afford sufficient support for the protector.

In applying my invention to single tube tires, I may place the protector against the inner surface of such tire, and in fact Fig. 1 may be said to represent a single tube tire, if we imagine the inner tube C removed. In such a case the canvas strip D might be omitted and the strips of plates E³ secured direct to the backbone formed by the plates E.

The improved protector, consisting of the hinged plates E, E³, and the canvas strip D, might also be applied to the outer surface of a single tube tire, so as to form the tread member thereof, in which case the edges of the canvas strip D would be clamped or otherwise secured between the tire and the rim.

I claim:

1. A tire protector composed of a number of metal units flexibly connected together to form a backbone and numerous ribs extending at right angles thereto, said ribs tapering from the backbone to their extremities, the flexible connection between the units being arranged to permit the rib units to move at right angles to the backbone, and the backbone units to move only at right angles to said ribs.

2. A metal tire protector comprising a backbone and lateral ribs at right angles thereto, said backbone and ribs being made up of a series of metal units connected end to end, the connections between the units being such that the backbone may bend only at right angles to the ribs, and the ribs at right angles to the backbone.

3. A tire protector comprising a backbone made up of a series of metal units hinged together end to end to permit relative movement of the units only on lines transverse to the length of the backbone, and a series of

transverse ribs extending on opposite sides of said backbone, said ribs being independent of each other, and being made up of metal units hinged together to permit relative movement in lines transverse to the length of the ribs.

4. A tire protector comprising a backbone made up of a series of metal units connected together end to end to permit relative movement of the units only in lines transverse to the length of said backbone, and transverse ribs on opposite sides of said backbone composed of metal units connected together end to end to permit relative movement of the units in lines transverse to the length of said ribs, said ribs tapering from the backbone to their outer ends, means for connecting said ribs to the backbone, the protector as a whole being adapted to be spread out flat with all of its parts in substantially the same plane, and being also adapted to conform to the shape of a pneumatic vehicle-tire.

5. In a double tube tire, the combination of the inflatable inner tube and the shoe, with a removable protector interposed loosely between the shoe and the said tube, said protector comprising a backbone, and lateral ribs extending at right angles thereto, said backbone and ribs being made up of a series of metal units connected end to end, the connections between the units being such that the backbone may bend only at right angles to the ribs, and the ribs at right angles to the backbone.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

MADELEINE MERLI MILLS.

Witnesses:

JOHN LOTKA,
JOHN A. KEHLENBECK.