No. 617,505. Patented Jan. 10, 1899.

H. B. HOLLIFIELD.

TIRE.

(Application filed Oct. 31, 1898.)

(No Model.)

Fig. 1.

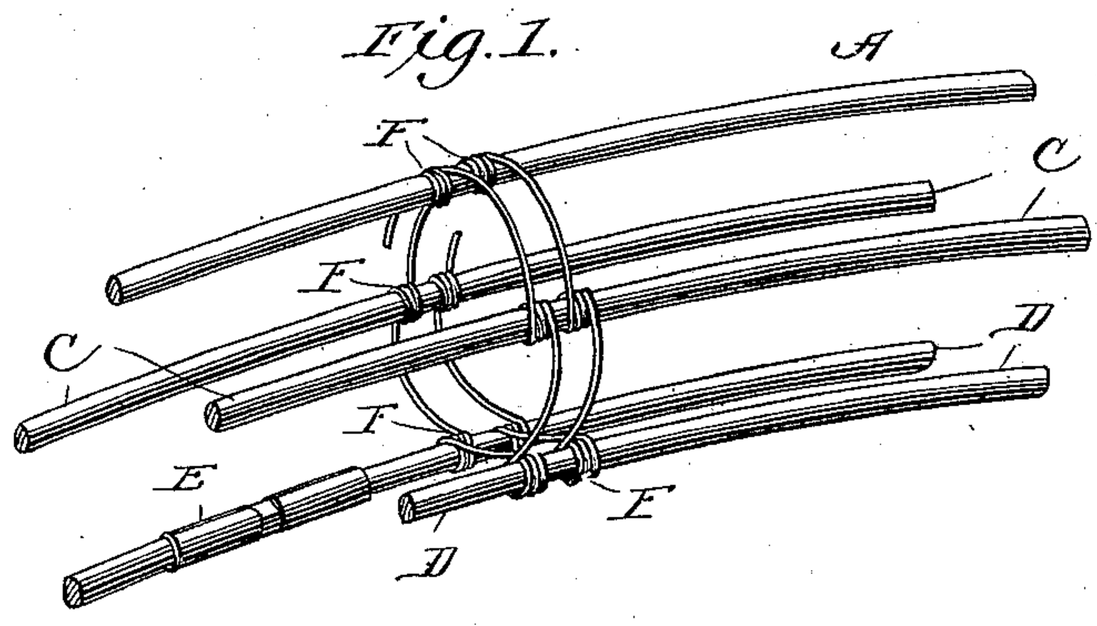


Fig. 2.

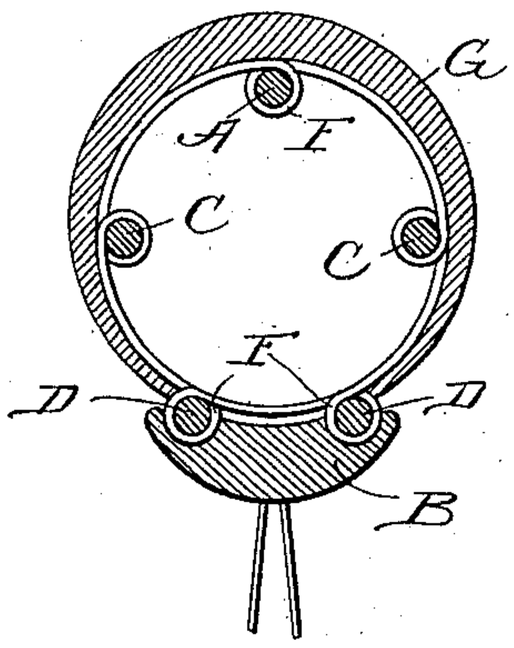


Fig. 3.

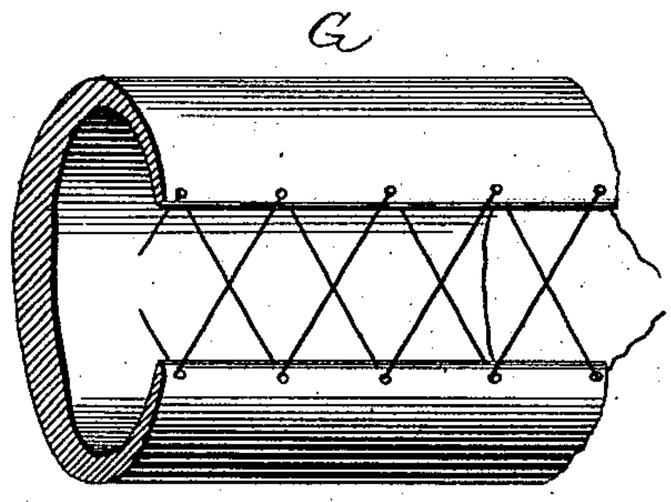


Fig. 4.

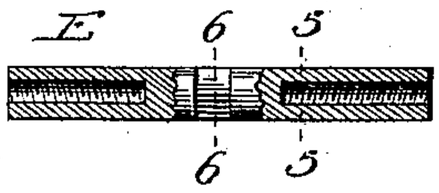


Fig. 6.

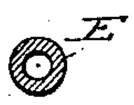


Fig. 5.

Fig. 7.

Fig. 8.

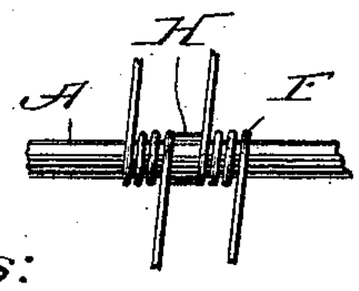
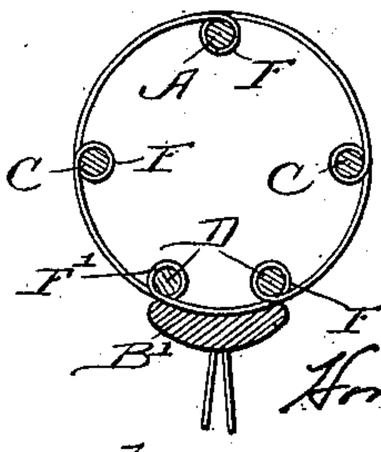


Fig. 9.



Witnesses:

Harry S. Rohrer.

Charles F. Linthicum

Inventor:

Horatio B. Hollifield

by Wiles & Lucas,

Attys.

UNITED STATES PATENT OFFICE.

HORATIO B. HOLLIFIELD, OF SANDERSVILLE, GEORGIA.

TIRE.

SPECIFICATION forming part of Letters Patent No. 617,505, dated January 10, 1899.

Application filed October 31, 1898. Serial No. 695,043. (No model.)

To all whom it may concern:

Be it known that I, HORATIO B. HOLLIFIELD, a citizen of the United States, residing at Sandersville, in the county of Washington and State of Georgia, have invented certain new and useful Improvements in 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 appertains to make and use the same.

The object of this invention is to produce a resilient vehicle-tire that shall not be subject to collapse through puncturing. The desired end is attained by encircling the rim with a series of spring-metal hoops larger than the rim and concentric therewith, holding them in place by means of a compressible annular tube of comparatively small spring-wire bent to form a series of rings and incasing the whole in a pliable cover, preferably analogous to covers used for common pneumatic tires. The rings are shown as either integrally connected or independent.

In the drawings, Figure 1 is a perspective view of a small portion of the tire, the cover being omitted. Fig. 2 is a cross-section of the complete tire and the wheel-rim. Fig. 3 shows the tire-cover alone, the view being radially outward. Figs. 4, 5, and 6 are respectively a side view and cross-sections of a certain sleeve used for uniting the ends of certain of the hoops. Fig. 7 is a cross-section, analogous to Fig. 8, showing a slight modification. Fig. 8 shows the application of short sleeves upon the hoops between the turns or rings of the coil. Fig. 9 shows a modified form of coil and rim, the one ring seen being endless, as those of the other form may also be.

In the figures, A is an endless spring-hoop concentric with the rim B in its medial plane and nearly a tire's diameter outside of it.

C C are similar hoops, in diameter approximately midway between the diameters of the rim and the hoop A. These are located one on each side of said plane, about a tire's diameter apart.

D D are retaining-hoops encircling the rim near its margins, respectively. The five hoops are connected by compressible rings of spring-wire formed as if by winding the wire about one of the hoop-rods to form a subordinate coil or spring F, carrying it thence on the arc of a circle touching the rods to the next hoop, and winding it about the rod in like manner, and so on, until there are enough rings to form, with the hoops which they connect, a complete annular tube. The hoops D D lie outside the tubes formed by the rings, and the ring-wire is turned outward around them, thus forming springs F without the tube, while the like springs upon the hoops A C are within it. Practically the rods may be inserted after all the rings have been formed independently of the hoops. The metal structure thus formed is incased in a cover G, whose edges are laced together or secured by any other suitable means, and the whole is then placed upon the rim, the hoops D D being primarily large enough to pass over the rim's edges. The hoops D are divided, and the meeting ends are oppositely threaded and engaged in a correspondingly-threaded sleeve E, having its middle non-circular, as in Figs. 1, 4, and 5, or provided with lever-receiving apertures, as in Fig. 7, whereby the sleeve may be rotated to draw the ends of the hoop together and bind the tire firmly to the rim. That a lever or wrench may be used for this purpose, the cover at one point is not drawn in closely until the tire has been secured in place.

If desired, short sleeves H, Fig. 8, may be placed upon the hoops between the rings of the wire tube, and it is obvious that more than one rod may be used upon the tread side of the tire (near the place of the hoop A) and that the number of lateral hoops (near the places of the hoops C C) may be increased. The two retaining-hoops may be inside the coil, as shown in Fig. 9, and in such case the coils or springs F′ will of course be within the main coil, like the others, and the rim will be correspondingly changed. The number of retaining-hoops is not invariable, though I prefer to use two.

In use the outer hoop A first receives the pressure, which is at once shared by the hoops C C and transmitted thence to the rim by the numerous rings of the tube. The hoops A C under pressure spring toward the wheel's axis, and the last two at the same time move outward, allowing the tire to flatten as a pneumatic tire does; but the strain at the point of pressure is carried circumferentially around the rim and thus widely dis-

tributed by the hoops, which principally support the pressure and give the wheel the desired resiliency.

When the hoop A yields at any point, the springs or coils F thereon open slightly, the like springs upon the hoops C C close slightly, while those upon the hoops D D either close or open, according as they are without or within the main tube. In any case the tube may yield at the edges of the rim without being bent over the same and permanently "set," a great advantage gained without narrowing the broad bearing of the tire upon the rim. The main tube then serves distinct ends in that it holds the hoops in place and by the elastic force of its numerous little coils increases the resiliency of the tire. It is plain that either by increasing the number or the size of the wires or hoops, and preferably the size of the tube-wire also, the tire may be made strong enough to properly cushion heavy vehicles without in the least changing the invention. So far as cushioning is concerned the cover might be omitted, but both for appearance and for the exclusion of foreign matter it should be used.

I have shown slight modifications in construction, and as others are clearly within my invention I do not wish to limit myself to the precise construction set forth.

What I claim is—

1. A tire-tube, of spring-wire bent to form successive rings having, in each, small integrally-formed coils some within and some without said tube.

2. A tire-tube of spring-wire, having in each ring two small, integrally-formed subordinate coils without the tube and about a rim's width apart.

3. The combination with a suitable wheel-rim, of a tire-tube, of spring-wire, having its individual rings bent into small internal coils at the outer and the side walls of the tube, and endless spring-hoops lying, respectively, within the sets of small coils, substantially as set forth.

4. The combination with a wheel-rim, of a spring-wire tire-tube having each of its rings bent out of its normal path to form two small coils lying respectively over the two marginal portions of the rim, and means for securing the tube upon the rim.

5. The combination with an annular spring-wire tube having its rings bent to form one or more sets of small registering internal coils upon the tread side and one or more like sets upon each lateral wall of the tube, of endless spring-hoops lying respectively in the sets of small coils so formed.

6. The combination with the spring-wire tire-tube having the sets of integrally-formed small coils, of the spring-metal hoops lying, respectively, in said sets, and the cover enveloping the tube, substantially as set forth.

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

HORATIO B. HOLLIFIELD.

Witnesses:

HARRY S. ROHRER,

H. M. STERLING.