

(No Model.)

A. A. & H. C. KUPFER.
WHEEL TIRE.

No. 536,752.

Patented Apr. 2, 1895.

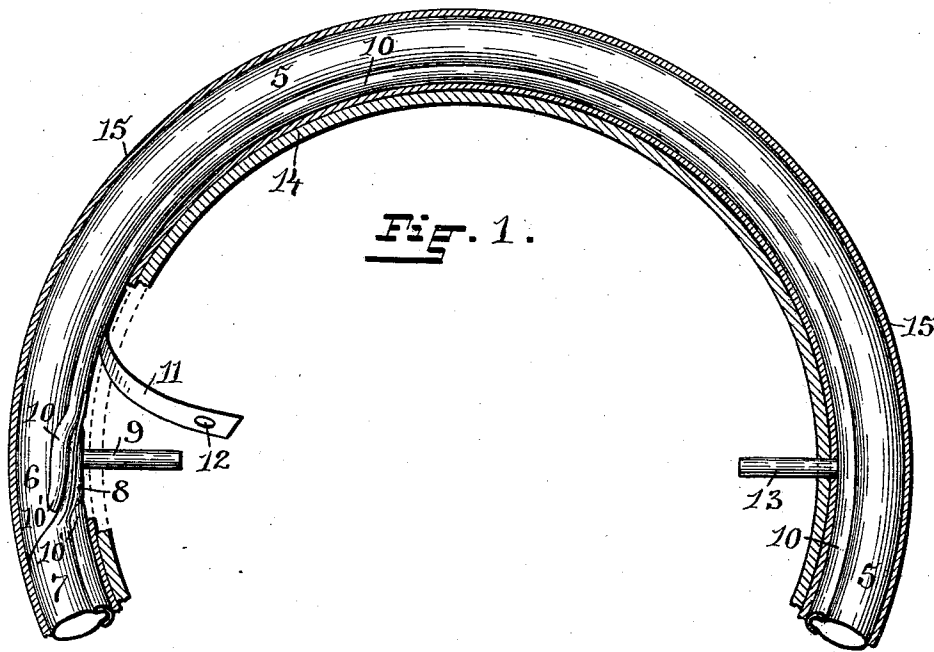


Fig. 1.

Fig. 2.

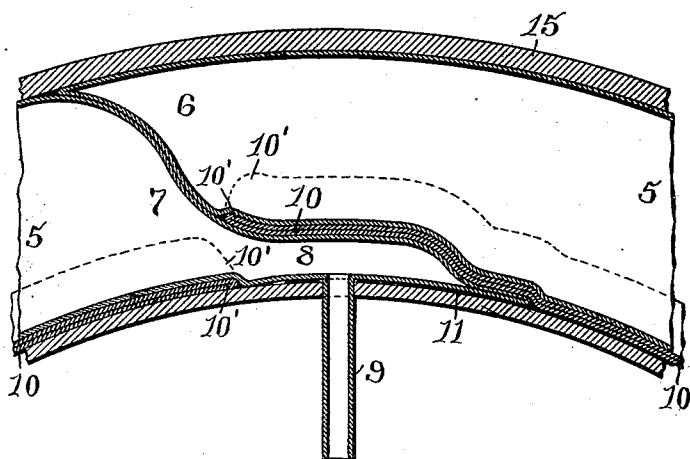
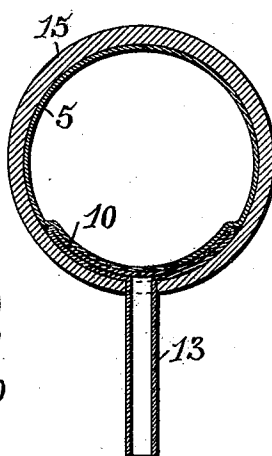


Fig. 3.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ARTHUR A. KUPFER AND HERMAN C. KUPFER, OF PROVIDENCE, RHODE ISLAND.

WHEEL-TIRE.

SPECIFICATION forming part of Letters Patent No. 536,752, dated April 2, 1895.

Application filed November 20, 1893. Serial No. 491,455. (No model.)

To all whom it may concern:

Be it known that we, ARTHUR A. KUPFER and HERMAN C. KUPFER, both of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Wheel-Tires; and we hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to improvements in that class of wheel-tires in which an outer sheath is expanded by devices contained within the sheath and adapted to be inflated.

The object of the invention is to so construct the inflating-device, in the nature of a tube, that the overlapping-ends of the same will receive but a slightly larger amount of the air, or other inflating medium, than the main portion of the tube.

Another object of the invention is to provide an expanding-device, for the sheath of a tire, in the nature of independent expansible tubes normally held together on their exterior surfaces but separable for the purpose of repairing the adjoining surfaces.

The invention consists in the combination with a tire-sheath, of the peculiar independent tubes contained within the sheath and temporarily secured together on their outer surfaces, each tube having an independent valve-stem.

The invention also consists in such other novel features of construction and combination of parts as will hereinafter be more fully described and pointed out in the claim.

Figure 1 represents a sectional view of the tire-sheath showing a side view of parts of the improved expanding-device in the position they will assume, under normal conditions, when being secured in place. Fig. 2 represents an enlarged longitudinal sectional view of the same to more clearly show the overlapping ends of the tubes. Fig. 3 is a cross-sectional view of the tire taken on a line through the valve-stem of the supplemental-tube.

Similar numbers of reference designate corresponding parts throughout.

Inflating-tubes for sheath-tires have heretofore been made either too long or too short

for the sheath. In the first case the ends of the tubes overlap and, when inflated, each receives as much air as the other resulting in an enlargement of the sheath at this point and a disagreeable succession of jolts as this portion of the tire comes in contact with the roadway. In the latter case the stretch of the tube, under the air pressure, is not sufficient to fill the sheath and a portion of the sheath is left unsupported by the tube.

The ends of the inflating-tubes for tires have heretofore been formed with the end portions of the walls flattened together and secured, or the end portions have been turned inwardly upon themselves and cemented, in either case leaving a considerable portion of the material which is not expanded as the inflating medium has no entrance thereto. In fact, while the ends of the tubes are elastic, they do not possess the resilient qualities of the main portion of the tube when under air pressure. Now when these ends of the tube overlap, that portion of the tire at which they are located is heavier than any corresponding portion of the tire and does not possess the same resilient qualities owing to the occupation of the space, which should be filled by air, by the ends of the tube.

When a plurality of inner tubes have been used they have been so constructed and arranged that when punctured it is most difficult to repair the same.

In carrying our invention into practice we construct an inflating-device of several independent tubes, of which two only are shown in the drawings. The main tube 5 is designed to lie within the tread portion of the sheath when expanded. This tube is formed of expansible material longer than the circumferential length of the sheath so that when in position the ends 6 and 7 overlap. The end 6 is shaped so that it may fully expand, being rounded or hemi-spherical, the walls of the end 7 being secured together in a flattened position, and between the walls is secured a contracted inlet passage 8 formed of some flexible material which is practically non-expansible. This contracted passage connects with the interior of the tube and from it extends the valve-stem 9 to which any usual form of valve is connected.

The supplemental-tube 10 is designed for use only when the main tube 5 becomes injured. It is also formed of elastic material and is shorter than the tube 5 being adapted
5 to lie within that portion of the sheath nearest the wheel-rim. This supplemental-tube is secured to the outer surface of the tube 5 temporarily either by unvulcanized cement or by any other means which will permit of
10 the ready separation of the two when it becomes necessary to repair their adjoining surfaces. The supplemental tube is provided with a hole 12 to fit over the valve-stem 9 of
15 the main tube when the strip may be secured to the opposite end of the tube 10 by unvulcanized cement, and a valve-stem 13 connects with the supplemental tube through which air may be introduced to inflate the same.
20 The ends of the tube 10 and the end 6 of the main tube 5 are constructed with semi-circular ends which are cemented together so as to provide a thickness of material over the joint very little, if any, greater than the thick-
25 ness of the main wall of the tube. This construction will be understood by reference to the ends 10'-10' in the drawings, it being better illustrated by the collapsed tube 10 than if the same were expanded. By this
30 means the expansibility of the ends of the tubes is equal to that of the sides and no additional thickness of the material from which the tube is made is introduced in the tire to

deaden the resiliency of the portion of the tire in which they are located.

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In practice the tubes are secured in place around the wheel-rim 14 through perforations in which the valve-stems 9 and 13 extend, and over the tubes is secured the sheath 15 in any ordinary manner. By temporarily securing
40 the tubes together they are held in their proper positions while they may be readily separated when it becomes necessary to repair their adjoining surfaces.

Having thus described our invention, we
45 claim as new and desire to secure by Letters Patent—

The combination, in a wheel-tire having a sheath, with the main tube 5 having the over-
lapping-ends 6 and 7, the contracted non-ex-
50 pansible passage 8, and a valve-stem connected with such passage, of the supplemental-tube 10 having the valve-stem 13 and temporarily secured to the outer wall of the tube
5 by unvulcanized cement, and the securing-
55 strip 11 carried by one end of the supplemental-tube and adapted to be temporarily secured to the opposite end of said tube, as described.

In witness whereof we have hereunto set
60 our hands.

ARTHUR A. KUPFER.
HERMAN C. KUPFER.

Witnesses:

HENRY J. MILLER,
M. F. BLIGH.