

E. H. TRUMP.
 EXPANSIBLE CORE FOR REPAIRING TIRES.
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1,047,594.

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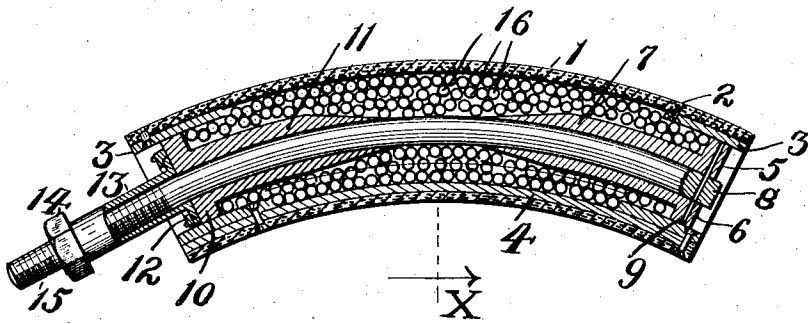


Fig. 1

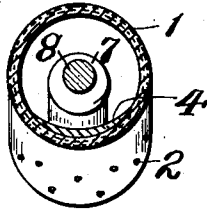


Fig. 2

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UNITED STATES PATENT OFFICE.

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EXPANSIBLE CORE FOR REPAIRING TIRES.

1,047,594.

Specification of Letters Patent. Patented Dec. 17, 1912.

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To all whom it may concern:

Be it known that I, ELNO HENRY TRUMP, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented new and useful Improvements in Expansible Cores for Repairing Tires, of which the following is a specification.

This invention relates to devices for expanding and supporting the inner wall of a tire-shoe, forming part of a double tube pneumatic tire, during the process of repairing the same.

The method heretofore employed consists in sustaining the inner face of the wall of a tire-shoe by means of an air-bag, but as these air-bags, in order to hold air under pressure, are generally made of vulcanized rubber, they rapidly deteriorate due to the heat used in repairing the tire-shoe, in other words, they keep on vulcanizing while in use and become harder and harder until they become worthless.

The object of this invention is therefore, broadly speaking, to provide a device which may be used in a tire-shoe for supporting the inner wall thereof and which can be positively expanded at will for stretching and sustaining the portion of the wall which is to be repaired and which during the repairing is usually clamped in a vulcanizing repair-mold.

More specifically the invention embodies a cylindrically-shaped bag of slightly extensible material provided with one or more wedging elements fitting snugly within the bag and capable of being longitudinally shifted by means which can be reached through the open part of the tire-shoe. The interior of the bag is substantially filled with a plurality of small movable bodies such as shot, pebbles, sand, and the like, which are caused to spread laterally under the longitudinal pressure exerted by the wedging element as it is shifted to cause the bag to expand and fill the interior of the cavity of the tire-shoe and thereby sustain the wall of the same during the repair thereof.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts constituting the invention to be hereinafter specifically described and illustrated in the accompanying drawings which form a

part hereof wherein is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings in which similar reference numerals indicate like parts in the different figures, Figure 1, is a central longitudinal view of an expansible core embodying this invention; and, Fig. 2, is a transverse sectional view of the device shown in Fig. 1 on line X thereof, with the movable bodies omitted.

In practice the core is preferably segment-shaped and of a length to sustain the portion of the tire-shoe which is to be repaired and if desired it may be made longer or shorter to suit the various kinds of repairs needed on a tire-shoe.

Referring to the drawings in detail the reference numeral 1 indicates an elongated and preferably cylindrical bag of slightly extensible material such as canvas or duck, and of a size to properly fit within a tire-shoe. Secured to the inner wall of the bag by hold-fast devices such as rivets 2, and positioned at the ends thereof are a pair of metallic sleeves 3 which serve to hold the ends of the bag cylindrical and prevent the same from collapsing as well as furnishing a stiffening medium for the ends of the device. Extending between the sleeves 3 is a stiffening member 4 hereinafter designated as a "back-bone" and usually crescent-shaped in cross-section. The ends of the "back-bone" are secured to the outer faces of the collars 3 within the canvas bag 1 and preferably held in place by the same hold-fast devices which secure the ends of the bag to the collar 3. The "back-bone" 4 is used to stiffen the general structure so as to permit easy handling of the same. Slidably mounted in the sleeve 3 at one end of the core is a conical wedge 5 comprising a head 6, slidable along the interior of the collar 3, and having an elongated tubular stem 7 the outer face of the inner end of which is cone-shaped for producing a wedging action. Extending centrally through the bag 1 and into the tubular wedge 5 is a rod 8 one end of which is preferably secured to the head 6 by means of a pin 9. The rod 8 preferably has a curvature corresponding to the curve of the bag 2. Mounted on the opposite end of the

rod 8 is a tubular wedge 10 approximately similar to the wedge 5 and provided with an inwardly-projecting stem portion 11 the outer face of which is conically-formed. Secured to the outer face of the wedge 10 is a flanged ring 12 adapted to receive and hold the inner flanged end of a tubular nut 13 provided with a head 14 shaped to receive a wrench and provided with interiorly-arranged threads to engage a threaded portion 15 formed at the end of the rod 8.

The interior of the bag 1 excepting where occupied by the wedges 5 and 10 and the rod 8 is filled with a plurality of movable bodies 16 which may consist of shot, hard steel balls, pebbles, sand, or any other similar materials of such a nature as to be capable of rolling over each other and moving when the tubular wedges 5 are drawn toward each other by the manipulation of the tubular nut 13, to thereby force them outwardly to expand to a slight degree the wall of the bag 1, to cause the same to engage and support the inner face of the wall of a tire-shoe.

In using this core it will be inserted in the opening in the open portion of the tire-shoe to cover the damaged portion thereof, and the tire-shoe is then placed in a vulcanizing repair-mold, the portions of which are drawn snugly to place thereby clamping the wall of the tire-shoe against the expansible core, after which a suitable tool is applied to the head 14 of the tubular nut 13 and rotated in such a manner as to cause the tubular nuts 5 and 10 to approach each other thereby displacing the imprisoned movable bodies to cause them to expand the wall of the core firmly against the inner face of the wall of the tire-shoe. After this the necessary heat is applied until the patch covering the damaged portion of the tire-shoe has been cured. The core is then removed by reversing the direction of rotation of the head 14 of the tubular nut 13, to release the pressure on the movable bodies 16 and as the flange on the inner end of the tubular nut 13 is held against independent movement by the overhanging flange-ring 12 the tubular wedge 10 is drawn outwardly in unison with the nut. This removes the pressure on the bodies, permitting the ready withdrawal of the core which is then ready for use again.

It will be apparent that the canvas or fabric wall of this core is not readily burned or capable of being quickly worn out as are the air-bags now commonly in use, which being of vulcanized rubber are quickly ruined by the operation of repeatedly heating them during the vulcanizing of a repair-patch on a tire-shoe, and at the same time the danger of using metal, which sometimes burns the tire-shoe, is entirely eliminated.

I claim:

1. A repair core for pneumatic tire-shoes embodying a flexible bag containing a plu-

70 rality of relatively small movable bodies, sleeves positioned within said bag, at the ends thereof, a "back-bone" connecting said sleeves for stiffening the device, a threaded rod extending longitudinally of said bag, a wedging-element mounted on said rod, means for shifting the position of said wedging element, the latter arranged when shifted in one direction to displace said movable bodies against the wall of said bag for positively 75 expanding the latter.

2. A repair core for pneumatic tire-shoes embodying a bag of flexible material approximately cylindrical in cross-section with open ends and curved in the arc of a circle corresponding to the tire-shoe in which it is to be employed, closure members for the ends of said bag, a rod extending through said bag, a wedging-element shiftably mounted on said rod, means for shifting said wedging-element longitudinally of said bag, and a mass of small movable bodies positioned within said bag and around said rod arranged to be laterally displaced by said wedging-element for expanding the 90 wall of said bag within a tire-shoe.

3. A repair core for pneumatic tires embodying an open-ended bag, cylindrical in cross-section and curved in the arc of a circle approximating the curvature of the tire-shoe in which it is to be used, guiding-sleeves positioned in the ends of said bag, a mass of small movable bodies contained in said bag, a rod extending through said bag, a closure device for said bag positioned within the 100 guiding sleeve at one end thereof, a wedging-element shiftably mounted in said bag at the opposite end of said bag, and means for shifting said wedging-element for laterally displacing said movable bodies to thereby expand the wall of the bag within a tire-shoe. 105

4. A repair core for pneumatic tires embodying an open-ended bag of flexible material approximately cylindrical in cross-section and formed in the arc of a circle corresponding to the tire-shoe with which the same is to be employed, a mass of small movable bodies within said bag, a rod extending through said bag, a wedging-element shiftably mounted on said rod, means for shifting said wedging-element for laterally displacing said movable bodies for expanding the wall of said bag within a tire-shoe, a sleeve connected with said wedging-element inclosing said bar, and a nut mounted on one end of said rod adapted when rotated to engage said sleeve and shift the position of said wedging-element to laterally displace said movable bodies for expanding the 120 wall of said bag. 125

5. A repair core for pneumatic tire-shoes embodying a tubular member of flexible material having open ends, said member approximately cylindrical in cross-section and 130

curved in the arc of a circle approximating
the curvature of the tire-shoe in which it is
to be used, guiding sleeves positioned in the
ends of said member, a mass of small mov-
5 able bodies contained in said member, a rod
extending through said member, a closure
device positioned within the guiding-sleeve
at one end of said member and mounted on
said rod, a wedging-element shiftably
10 mounted on said rod at the opposite end of
said member, said wedging element pro-
vided with an inwardly-extending cone-

shaped portion adapted to laterally displace
a relatively large volume of said movable
bodies to expand the wall of said member 15
within a tire-shoe.

In testimony whereof I have hereunto set
my hand in presence of two subscribing
witnesses.

ELNO H. TRUMP.

Witnesses:

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ANNA L. McCLINTOCK.