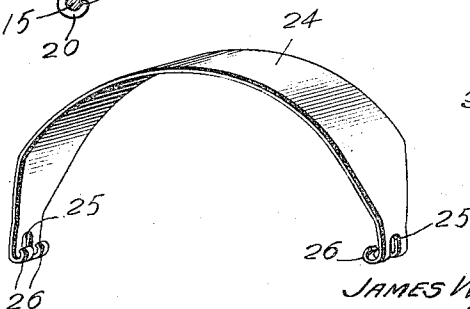
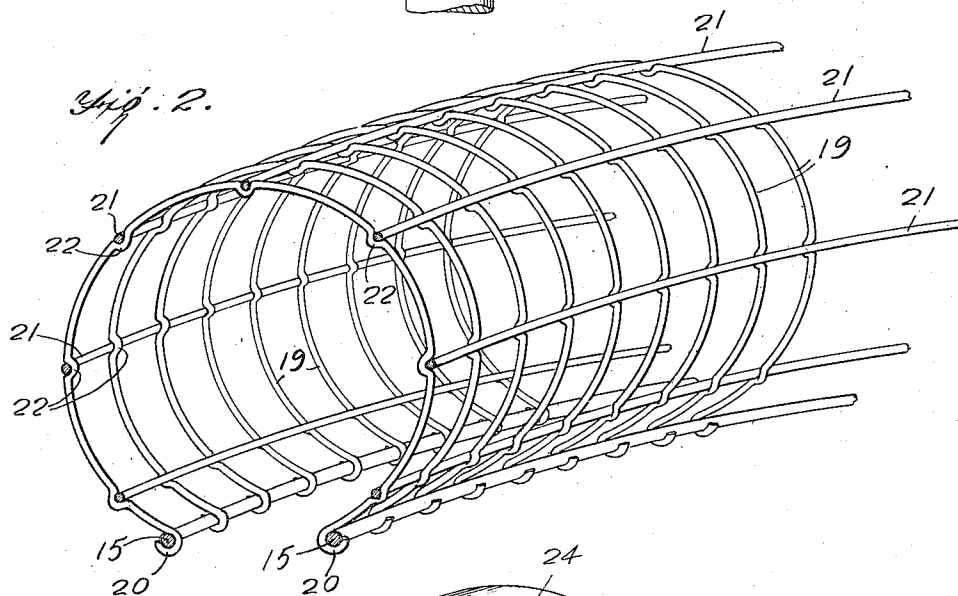
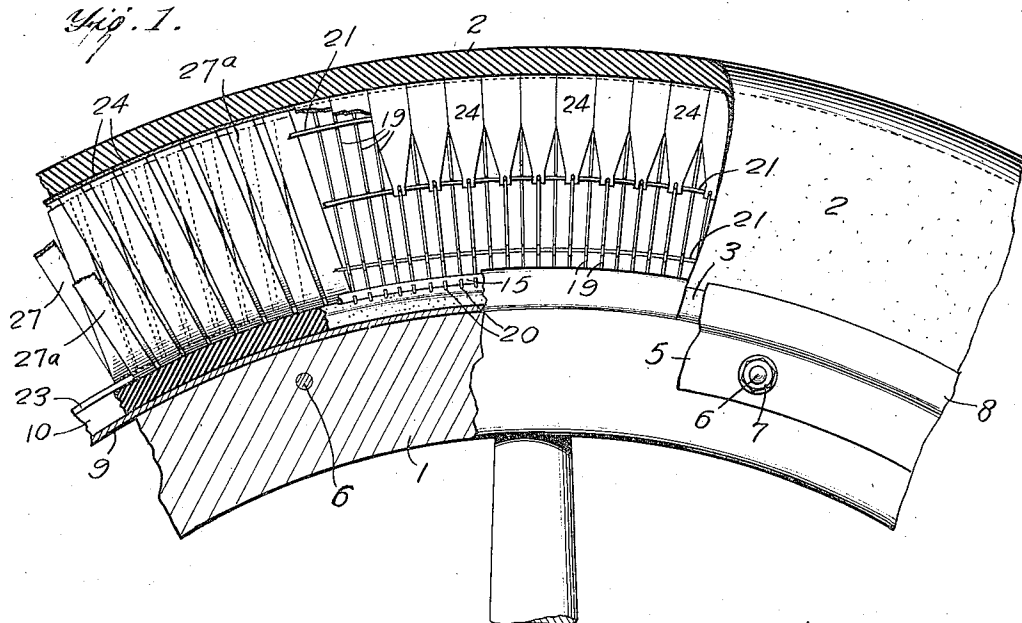


J. W. T. STEPHENS.
 SPRING CUSHION TIRE.
 APPLICATION FILED JUNE 12, 1914.

Patented June 8, 1915.
 2 SHEETS—SHEET 1.

1,142,279.



WITNESSES

L. H. Schmidt
 C. E. Trammor

INVENTOR

JAMES W. T. STEPHENS,
 BY *Munn & Co.*

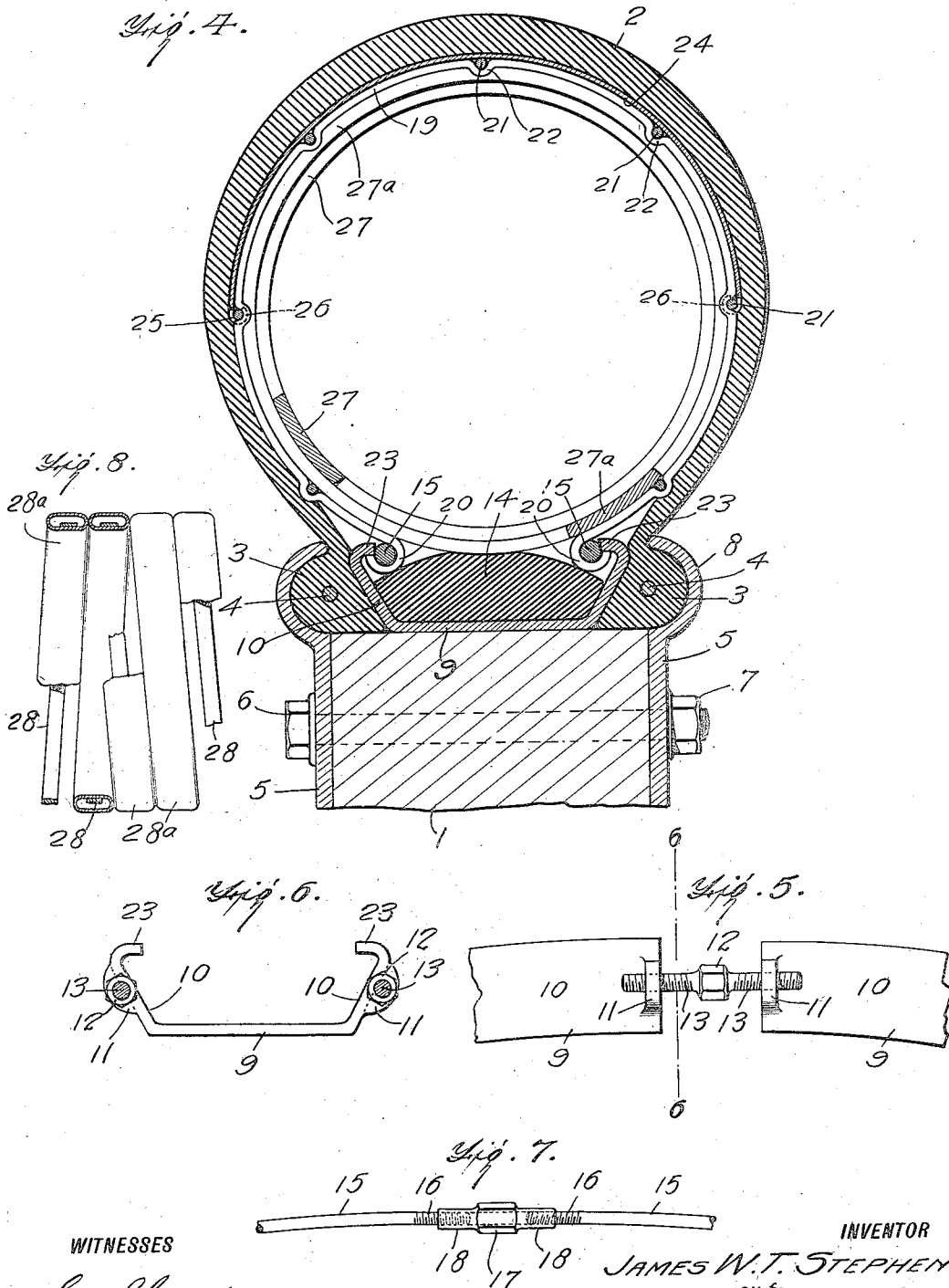
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UNITED STATES PATENT OFFICE.

JAMES W. T. STEPHENS, OF NEW ORLEANS, LOUISIANA.

SPRING-CUSHION TIRE.

1,142,279.

Specification of Letters Patent.

Patented June 8, 1915.

Application filed June 12, 1914. Serial No. 844,681.

To all whom it may concern:

Be it known that I, JAMES W. T. STEPHENS, a citizen of the United States, and a resident of New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and useful Improvement in Spring-Cushion Tires, of which the following is a specification.

My invention is an improvement in spring cushion tires, and has for its object to provide a device of the character specified, having the resiliency of a pneumatic tire, but which may be manufactured at a much lower cost, and wherein the danger from puncture and blow-outs is eliminated.

In the drawings, Figure 1 is a side view of a tire constructed in accordance with the invention, partly in section, Fig. 2 is a perspective view of the metallic framework, Fig. 3 is a similar view of one of the protector elements, Fig. 4 is a transverse vertical section of the improved tire, Fig. 5 is a side view of the spreader ring, Fig. 6 is a section on the line 6—6 of Fig. 5, Fig. 7 is a top plan view of the connection between one of the elements of the frame work, and Fig. 8 is a side view with parts in section of a modified construction.

The present embodiment of the invention is shown in connection with the rim or felly 1 of a wheel, and the tire comprises a shoe or casing 2 of suitable material, the said shoe or casing being of greatest thickness at the center and decreasing in thickness toward its side edges and having each of its side edges provided with an enlargement or rib 3, each rib being approximately semi-circular in cross section.

A holding wire or rod 4 is arranged at the center of each rib, the said wires or rods being of annular form and continuous and imbedded in the material of the rib. The shoe or casing is held on the rim 1 by means of cheek plates or ring housings 5, the said cheek plates or housings fitting the opposite side edges of the rim and being secured thereto by means of bolts 6.

The bolts are arranged at suitable intervals extending through registering openings in the rim and rings, and the bolts are engaged by nuts 7 to prevent disengagement of the parts. Each of the cheek plates or housing rings 5 is extended beyond the periphery of the rim as shown at 8, and each of the extended portions is bent to form an internal groove for receiving the adjacent

rib 3. The ribs 3 of the shoe or casing are held in outward position and in engagement with the extensions 8, by means of a trough-shaped spreading ring 9. The said ring is a split ring and engages the peripheral surface of the felly between the ribs. The ring is provided at each side edge with an upwardly and outwardly extending flange or rib 10, the said flanges or ribs extending at an obtuse angle to the body of the ring and engaging with their outer faces the inner plane faces of the ribs to hold them in proper position with respect to the housing rings 5.

At each end each flange 10 of the ring 9 is provided with an outwardly extending perforated lug, and the openings of the lugs are internally threaded, and are engaged by the ends of a double ended bolt, the said bolt comprising a head 12 of polygonal cross section and oppositely extending threaded stems 13, which engage the perforated openings of the lugs.

The ends of the bolt are oppositely threaded so that when the bolt is turned in one direction, the lugs 11 will be drawn toward each other and when the bolt is turned in the opposite direction the lugs will be moved away from each other. Thus the spreading ring may be tightened on the felly by means of the bolts 12—13, or may be loosened to permit the removal thereof.

A resilient rim pad 14 is seated in the trough-shaped spreading ring, the surface of the pad being shaped to fit the outer face of the ring and the adjacent inner faces of the flanges and the upper surface of the pad is arc-shaped from side to side, as shown. The shoe or casing 2 is held in expanded condition by means of the framework shown in Fig. 2, and the protector element shown in Fig. 3. The said framework is substantially circular in cross section and of annular form and comprises a pair of oppositely spaced binding rings 15, each of the said rings being a split ring, composed of wire or rod of suitable cross section, and each ring has its ends threaded as shown at 16 in Fig. 7, and the threaded ends of each ring are engaged by a double nut comprising a head 17 polygonal in cross section and internally threaded sockets 18.

The rings are connected at regular intervals by arc or wicket shaped members or wire or rod, each having at each end a hook or open eye 20 for engaging the adjacent

ring. The members 19 are connected and held in spaced relation by means of ring-shaped rods or wires 21, the said rods being arranged in spaced relation with respect to each other and with respect to the ring 15.

Each of the members 19 is provided at each of the rods 21 with an inward bend 22 of sufficient depth for receiving the adjacent wire 21, and the said wires may be secured in the bends or recesses 22, by soldering or brazing in any other suitable manner. The framework just described, fits within the shoe or casing as shown, the rings 15 being at the opposite sides of the pad 14, and each flange 10 of the spacing ring is provided with an inwardly extending rib 23 for engaging above the ends of the hooks or eyes 20 of the members 19, and the outer surface of the adjacent ring 15. The said rings 23 as shown in Fig. 4, hold the rings 15 and the hooks or eyes 20 in contact with the pad, thus holding the entire framework shown in Fig. 2 from displacement. The protector elements shown in Fig. 3 are resilient arc-shaped plates 24, each being approximately semi-circular and having its ends reduced and longitudinally slotted or recessed as shown at 25. Each end of each of the said elements is bent inwardly and upwardly to form hooks or open eyes 26 at each end of each element, and the said hooks are adapted to engage one of the rings 21 at each side of the framework. Each pair of hooks engages the ring or wire 21 at an element 19, the members of each pair of hooks engaging the ring or wire 21 at opposite sides of the said element.

The protector elements are arranged outside of the framework and between the same and the inner face of the shoe or casing, and they are of such width and the elements 19 are so arranged that there will be a protector element for every alternate member 19, as shown in Fig. 1.

The improved tire is completed by a plurality of annular cushioning elements 27 and 27^a, each of the said elements being formed from a ribbon of resilient metal wound in spiral form, the convolutions of the elements being spaced apart from each other as shown in Fig. 1, and the element 27 is of less diameter than the element 27^a and is arranged within the said element.

The element 27^a fits closely the inner surface of the framework shown in Fig. 2, and the element 27 fits closely the inner surface of the element 27^a.

In Fig. 8 the cushioning elements 27 and 27^a are replaced by other cushioning elements 28 and 28^a. The element 28 is precisely the same as the elements 27 and 27^a, but the element 28^a is formed from tubular material bent spirally with the convolutions lying alongside each other. The tubular structure from which the element is built, is

elliptical in cross section as shown, and the element 28 corresponding to the elements 27 and 27^a, is arranged within the element 28^a. The construction is otherwise the same as that shown in Figs. 1 to 7. It will be understood that the construction shown in Fig. 8 corresponds to the cushioning elements 27—27^a, and is arranged in the same manner with respect to the remainder of the tire.

Preferably the offsets, grooves or bends 22 in the rods 19 are laterally inward and outward, so that the alternate wires 21 are on the opposite side of the members 19 from the intermediate wires.

I claim:—

1. A device of the character specified, comprising in combination with the wheel, the shoe or casing, and the means in connection with the shoe and the wheel for holding the shoe in place on the wheel, said means including a spreader ring, said ring having an upwardly and outwardly extending flange at each side edge, a rim pad seated on the spreader ring within the shoe, an open framework encircling the wheel within the shoe and seated on the rim pad, said framework having steel holding rings spaced apart laterally, means for drawing the ends of each ring together for clamping it on the wheel, said rings resting upon the rim pad at the flanges of the spreader ring, and each flange having an inwardly extending rib extending outside of the adjacent holding ring, a plurality of resilient arms within the framework, and shield plates detachably connected with the framework at the tread of the casing.

2. A device of the character specified, comprising in combination with the wheel, the shoe or casing, a skeleton frame of approximately cylindrical form within the shoe or casing for expanding the same, cushioning elements within the frame, and protecting plates outside the frame between the same and the tread of the shoe, said plates being arched longitudinally and arranged transversely to the wheel alongside each other, each plate having hooks at its ends for detachably engaging the frame.

3. A device of the character specified, comprising in combination with the wheel, the shoe or casing having ribs at its side edges, and the means detachably connected with the wheel and having means for engaging the ribs to hold the shoe in place, of a split spreader ring engaging the periphery of the wheel between the ribs of the shoe and having means for holding the ribs from inward movement, means engaging the ends of the spreader ring for clamping the ring on the wheel, a resilient rim pad seated on the ring, and an open framework of approximately cylindrical form within the shoe and seated on the rim pad, and engaging the inner surface of the shoe to expand the same.

4. A device of the character specified, comprising in combination with the wheel, the shoe or casing, and the means in connection with the shoe and the wheel for holding the shoe in place, a skeleton frame within the shoe for expanding the same, cushioning elements within the framework, and protector plates of arc-shape arranged between the framework and the shoe, each of the said plates having means at its ends for detachably engaging the framework to hold the plate in place.

5. A device of the character specified, comprising in combination with the wheel, the shoe or casing detachably connected with the wheel, of an open framework for expanding the shoe or casing, cushioning elements within the framework, and arc-shaped protector plates arranged alongside each other transversely of the wheel at the

tread of the shoe or casing and detachably connected with the framework at their ends.

6. A device of the character specified, comprising in combination with the wheel, the shoe or casing, and the means in connection with the shoe and the wheel for holding the shoe in place, of a skeleton frame for expanding the shoe and cushioning elements within the frame, each of the said elements consisting of a ribbon of resilient metal wound in spiral form with the convolutions lying alongside each other, one of the said elements being within the other, and the convolutions extending in the opposite direction to those of the outer element.

JAMES W. T. STEPHENS.

Witnesses:

P. C. DOBARD, Jr.,
T. J. DOBBINS.