

J. A. WATERS.
 SPRING TIRE.
 APPLICATION FILED SEPT. 8, 1910.

997,223.

Patented July 4, 1911.

Fig. 1

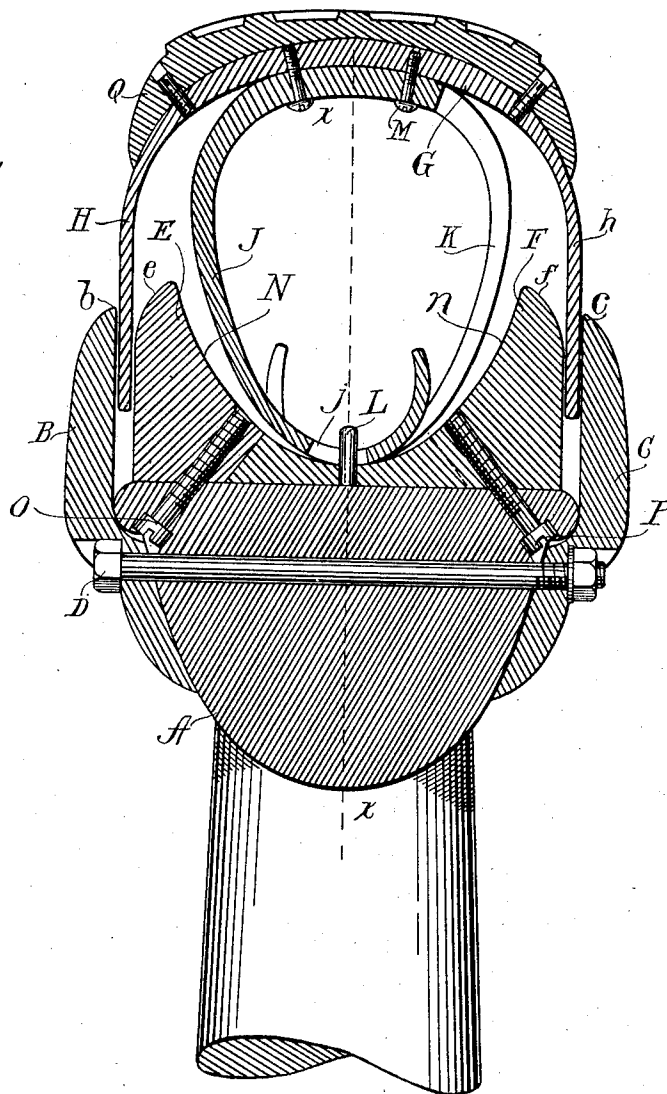
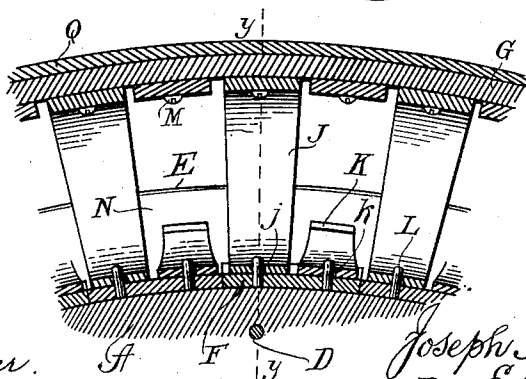


Fig. 2



Witnesses

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UNITED STATES PATENT OFFICE.

JOSEPH A. WATERS, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO JOHN O. WATERS, OF WASHINGTON, DISTRICT OF COLUMBIA.

SPRING-TIRE.

997,223.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOSEPH A. WATERS, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Spring-Tires, of which the following is a specification.

This invention relates to spring tires for all vehicles, but, more particularly for motor vehicles, and its object is the production of associated and combined parts formed of spring metal and having special construction and arrangement, together with other parts not resilient, but having particular form and arrangement whereby the elastic members are supported and retained in position.

The construction and arrangement of parts comprising this invention are illustrated in the accompanying drawings, of which—

Figure 1 represents a cross-section of the felly of a motor vehicle wheel to which this invention is applied. Fig. 2 is a section of a portion of the felly provided with this invention, the section being taken on line $x-x$ of Fig. 1, and the scale of drawing being somewhat reduced. The sectional view shown in Fig. 1 is taken upon the broken line $y-y$ of Fig. 2.

The same letter is used to refer to the same part throughout the drawings and description.

The felly A of the wheel is provided with the outer guard rings or vertical flanges B and C, secured to the felly by transverse bolts D. Upon the periphery of the wheel A are placed the two twin annular abutments E and F.

It will be observed in Fig. 1 that the parts are arranged in such manner as to leave spaces between the inner surfaces of the vertical flanges B and C, and the outer vertical surfaces of the abutments E and F, and a steel shoe G, which constitutes the outermost member of this invention, has the elastic sides H and h which are constructed of such thickness as to movably engage the spaces mentioned.

The outer member or shoe G is annular in form, and has ordinarily the inverted U-shaped cross-section illustrated in Fig. 1. Arranged within the shoe are the main or C-springs J and K, of which there may be

any required number of suitable dimensions, depending upon the size of the wheel, the weight of the vehicle and the load intended to be carried in regular service. The C-springs are provided with slots j and k near their lower ends, and the pins L extend upwardly through the slots from that portion of each abutment beneath the springs. The tops of the C-springs are secured to the shoe G by screws M. It will be understood, therefore, that the tops of the springs are rigidly secured to the shoe, and that the lower and lighter portions of the springs are movably connected with the abutments. Thus, the springs can rock sideways, or forward and backward, upon the abutments, but all springs are carried along by their connection with the abutments as the wheel turns, and the shoe is also turned by its connection with the springs. It is believed to be now clear that the springs cannot slip on the periphery of the wheel, nor can the shoe slip with respect to the springs.

In operation, the upper portion of the wheel would appear in cross-section substantially as illustrated in Fig. 1. The lower portion of the wheel, being called upon to support the load, would show the parts in different relative attitudes. The C-springs would be bowed outwardly and the sides H and h of the shoe G would approach the bottoms of the spaces between the flange rings B and C, and the outer surfaces of the abutments. The C-springs might even be bowed by sufficient load into contact with the curved inner surfaces N and n of the abutments, but, thereafter, additional load operates to bend the upper and stiffer portions of the C-springs, and the downward effect of the weight is correspondingly resisted. In a degree, therefore, the greater the load, the stiffer the C-springs become to support that load.

The tendency of the abutments E and F to spread under the action of the springs, is resisted by the screws O and P that secure the abutments to the periphery of the wheel. It is advantageous to recess the lower portions of the abutments at equal intervals, in order that upon placing them together, the line of separation between them does not directly encircle the wheel in the middle of its periphery, but, solid portions of the

abutments are located beneath each spring J and K.

If during the operation, the vehicle having tires constructed in accordance with this invention should turn a corner sharply and tend to slide sidewise, the C-springs will rock upon the abutments and the sides H and h of the shoe G will yield and bend more or less over the upper ends b and c of the flange rings, and the curved parts e and f of the abutments, all provided for the purpose of suitably holding the sides H and h of the shoe in the positions desired.

In practice it is advantageous to provide the shoe G with a protective shield Q, removably secured to the shoe. The shield Q is usually corrugated to increase the traction and to prevent "skidding." When worn or broken, the shield Q may be readily removed and replaced by a new one.

Having now described this invention, what I claim and desire to secure by Letters-Patent of the United States is:—

1. In a spring tire, the combination with a wheel, of abutments secured to the periphery of the wheel and having curved inner surfaces, flanged rings secured to the wheel outside the abutments whereby spaces are left between the abutment and rings, a shoe having elastic sides movably mounted in the said spaces between the abutments and the flanged rings, and springs located between the abutments and having upper portions in contact with and supporting said shoe, the lower portions of said springs being in contact with the abutments midway between the said inner surfaces thereof

whereby the sides of the springs are normally out of touch with the abutments.

2. In a spring tire, the combination with a wheel, of abutments secured to the periphery of the wheel and having outer and inner curved surfaces, flanged rings secured to the wheel outside the abutments whereby spaces are left between the abutments and rings, a shoe having elastic sides movably mounted in said spaces between the abutments and rings, and springs having their upper portions rigidly connected with the said shoe and their lower portions movably connected with the said abutments.

3. In a spring tire, the combination with a wheel, of abutments secured to the periphery of the wheel and having curved inner surfaces, flanged rings secured to the wheel outside the abutments whereby spaces are left between the abutments and rings, a shoe having elastic sides movably mounted in the said spaces between the abutments and the flanged rings, and springs located between the abutments and having upper and heavier portions in contact with and supporting the said shoe and lower and relatively thinner portions in contact with the said abutments, the remaining portions of said springs being normally out of touch with the said abutments and shoe.

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

JOSEPH A. WATERS.

Witnesses:

BEN C. McQUAY,
EUGENE MURRAY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."