No. 812,143. PATENTED FEB. 6, 1906.

W. M. LEFFORT.

SPRING HUB FOR VEHICLES.

APPLICATION FILED SEPT. 20, 1905.

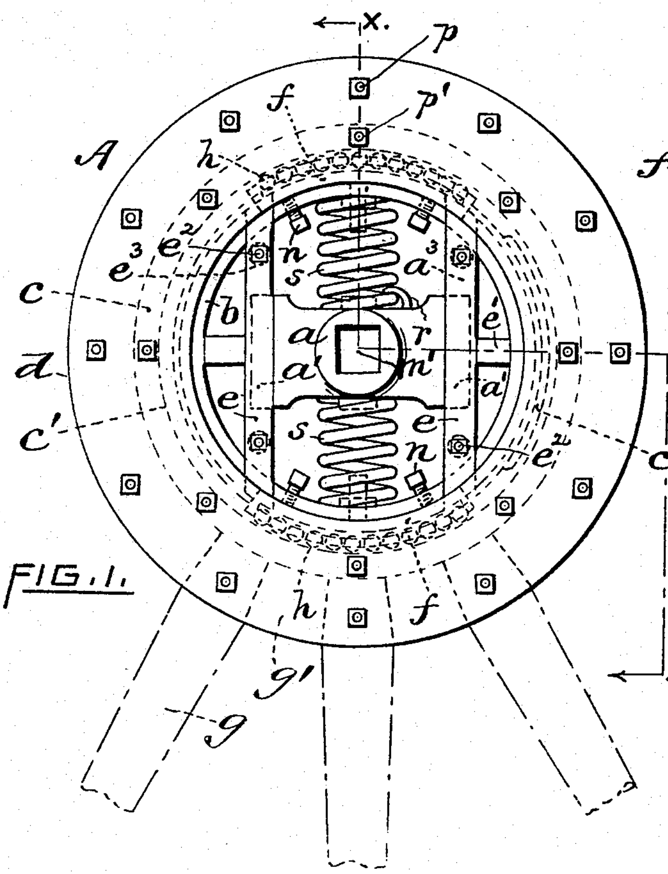


FIG. 1.

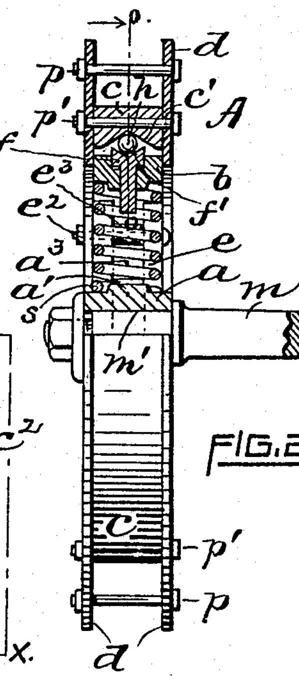
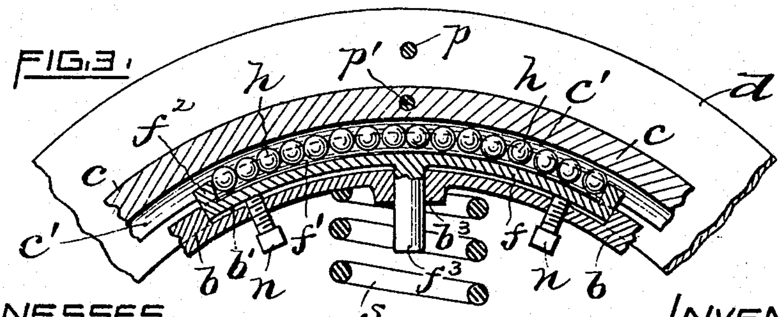


FIG. 2.

FIG. 3.



WITNESSES.

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SPRING-HUB FOR VEHICLES.

No. 812,143. Specification of Letters Patent. Patented Feb. 6, 1906.

Application filed September 20, 1905. Serial No. 279,218.

To all whom it may concern:

Be it known that I, WILLIAM M. LEFFORT, a citizen of the United States of America, and a resident of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Spring-Hubs for Vehicle-Wheels, of which the following is a specification.

My invention relates to improvements in vehicle-wheels, but more especially to the hub portions thereof, the latter, or rather the axle-box or skein, being resilient and yieldingly mounted in the wheel and capable of vertical movement independently of the spoke and rim portions.

I am well aware that vehicle-wheels have been provided with spring-hubs prior to my present improvement. This invention resides, essentially, in an improved construction and arrangement of the parts constituting the hub, all as hereinafter set forth and claimed.

By means of the invention herewith the cost of production is reduced, the hub portion of the wheel is rendered comparatively strong and stiff, it is not liable to become accidentally inoperative, it presents an attractive appearance, it is practically dust-proof, it readily adapts itself to inequalities or unevenness of the roads, and its movements are attended with a lessened degree of friction. In short, the improved wheel if provided with a cushioned or solid rubber tire may be successfully substituted for the usual type of wheel having pneumatic tires.

In the accompanying sheet of drawings, Figure 1 is a front elevation of a vehicle-wheel hub embodying my improvement, the rim, spoke, and axle portions being omitted. Fig. 2 is a corresponding side view, in partial central section, the latter being taken on line $x\,x$ of Fig. 1 and showing an axle mounted in the axle-skein; and Fig. 3 is an enlarged transverse sectional view taken through the peripheral portion of the hub and its contiguous parts or on line $o\,o$ of Fig. 2.

A in the drawings designates my improved vehicle-wheel hub as a whole.

The device is provided with a stationary circular frame b, having transversely and laterally separated ties or braces e, rigidly secured together and to the frame. These ties also form a combined bearing and guide for the axle-skein a, the latter having end extensions or tongues a', Fig. 1, mounted to move in a vertical direction in the spaces a^3, formed between the adjacent sides of the ties. (See also Fig. 2.) A short strut e' may be interposed between the frame and ties, as represented in Fig. 1. Each pair of ties, as drawn, is clamped together by bolts e^2, an interposed thimble or spreader e^3 for each bolt serving to keep the space a^3 true and parallel. (See also Fig. 2.) As drawn, the outer peripheral surface of the frame b is provided with oppositely-disposed recesses or pockets b' to receive therein the ball-boxes or ball-holders f. These latter (shown more clearly in Figs. 2 and 3) in turn each have a central circumferential groove f' for retaining a series of antifriction-balls h. End abutments f^2 maintain the balls in position circumferentially, while at the same time they are supported laterally by the V-shaped groove f', as clearly shown. The inner or concave side of the holder f has a central guide-stem f^3 passing through a lug or boss b^3 of the frame b. (See Fig. 3.) Adjusting-screws n, mounted in the frame and bearing against the holders f, maintain the latter and the balls in position with respect to the revoluble hub-ring c, about to be described. The said ring c surrounds the frame f and is concentric therewith. The inner face of the ring has a continuous central V-shaped groove c', adapted to form a seat for the said balls h. (See Figs. 2 and 3.) In order to provide means for readily inserting the frame b and its holders f, as in placing or assembling the parts, the inner edge of the ring may be cut away, as indicated at c^2, Fig. 1.

To the front and rear faces of the ring are secured by bolts p' a pair of thin flat annular plates d. These plate-rings, as drawn, extend outward beyond the ring c and also inwardly to a point about midway of the corresponding faces of the stationary frame b, thereby concealing and protecting the annular space formed between the adjacent edges of the members b and c, while at the same time forming a guard or shield to prevent the entrance into the ball-chamber of dust or other foreign matter.

The axle-skein a as drawn has a central hole m', adapted to receive a square axle m, the latter being kept in place longitudinally by a washer and nut in a well-known manner.

As thus arranged the axle is non-revoluble. If desired, the skein may be bored out to receive and form a bearing for a round axle.

I prefer to employ a pair of helical springs *s*, the same being oppositely disposed and located between and bearing against the adjacent surfaces of the frame and skein, as clearly shown in Fig. 1. When the axle-skein is in the central or normal position, the springs then being in equilibrium, a material increase in weight upon the axle will obviously operate to depress it, and compress the lower spring. In order that the upper spring may positively expand or elongate in unison with said action of the lower spring, the former may be fastened to the skein by a hook or clamp *r*.

In a vehicle-wheel provided with my improved spring-hub A the rim and tire and also the spoke portions may be constructed in any well-known or usual way. In the drawings, Fig. 1, the inner end of the spokes *g* (indicated by broken lines) are fitted to fill the space between the ring-plates *d*, all being secured in position by through-bolts *p*. Filling-in blocks *g'* may be used for closing the spaces between the spokes.

I prefer to make the faces of the members *b*, *c*, and *e* flat or in alinement with one another, or, in other words, the thickness of the hub is uniform throughout. The thickness of the axle-skein may, however, exceed that of the other portions of the hub.

I claim as my invention and desire to secure by United States Letters Patent—

1. In a yielding or resilient hub for vehicle-wheels, the combination of a non-revoluble circular frame, a spring-pressed axle-skein movably mounted and guided therein, a plurality of ball-holders adjustably mounted in the outer periphery of said frame, a flanged revoluble ring located outside of and concentric with said frame member having its inner face provided with a peripheral groove or seat and arranged to be secured to the spokes of the wheel, and antifriction-balls revolubly mounted in said holder members and bearing against the said grooved portion of the revoluble ring, substantially as described.

2. In a spring-hub of the character described, the combination with a stationary circular frame, antifriction-balls adjustably mounted therein and a vertically-movable spring-pressed axle-skein also supported and guided in said frame, of a revoluble ring member *c* arranged outside of and concentrically with said frame having its inner or concave face provided with a circumferential groove adapted to form a seat for said balls, and side plates *d* secured to and revoluble with said ring and extending toward the center of the hub to form a dust-guard and protector, substantially as described.

Signed at Providence, Rhode Island, this 18th day of September, 1905.

WILLIAM M. LEFFORT.

Witnesses:

GEO. H. REMINGTON,

EMMETT AINLEY.