M. E. KNIGHT.

RESILIENT WHEEL.

APPLICATION FILED APR. 2, 1910.

1,015,761. Patented Jan. 23, 1912.

Fig. 1.

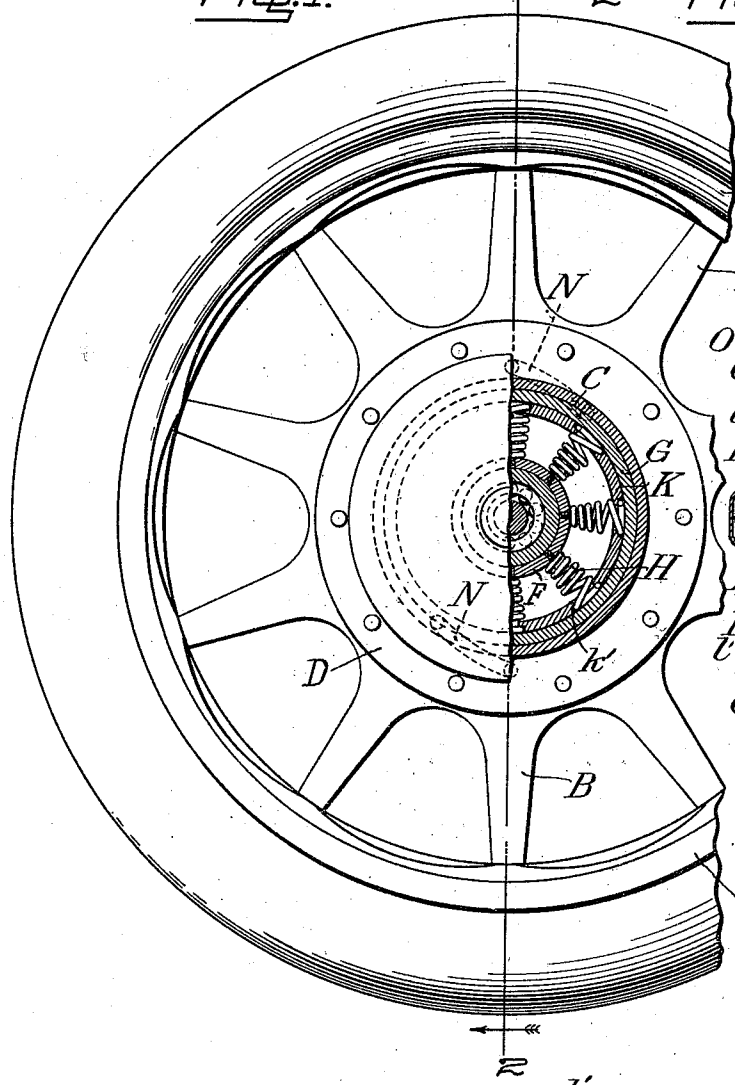
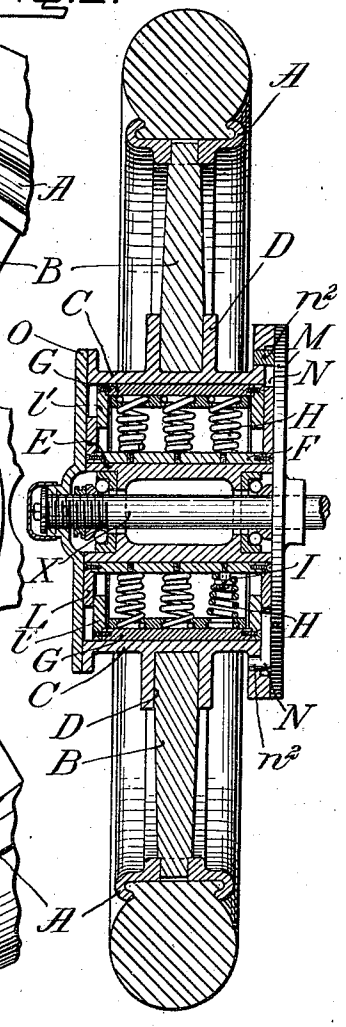


Fig. 2.



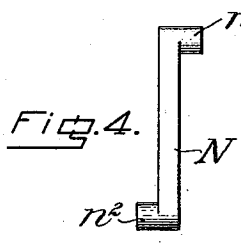


Fig. 4.

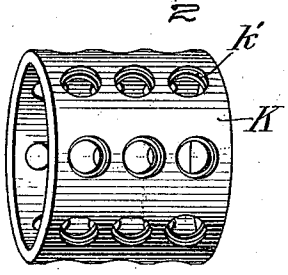


Fig. 3.

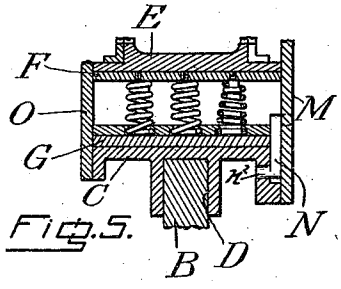


Fig. 5.

Witnesses:
P. A. Collins
J. H. Ryan

Inventor,
Margaret E. Knight,
By Reuben L. Roberts,
Atty.

UNITED STATES PATENT OFFICE.

MARGARET E. KNIGHT, OF FRAMINGHAM, MASSACHUSETTS, ASSIGNOR OF ONE-FOURTH TO ANNA F. DAVIDSON AND ONE-FOURTH TO BEATRICE M. DAVIDSON, BOTH OF SARATOGA SPRINGS, NEW YORK.

RESILIENT WHEEL.

1,015,761. Specification of Letters Patent. Patented Jan. 23, 1912.

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To all whom it may concern:

Be it known that I, MARGARET E. KNIGHT, of Framingham, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain Improvements in Resilient Wheels, of which the following is a specification.

The invention relates to resilient, or so-called spring wheels, especially for use on automobile vehicles, and consists in a series of springs arranged between the axle box and the support of the inner ends of the spokes of the wheel, and there held in such position that they will permit the wheel, that is to say, the rim, spokes and cylinder provided with the sockets for the inner ends of the spokes, to move with a resilient action to and from the axle in a radial direction, or diametrically when considered in relation to the whole wheel; in other words, it is a wheel with a resilient hub which will give the ease of motion of pneumatic tires, and obviate the necessity of their use, or greatly supplements the action of such tires if used in connection with these improved resilient devices.

In the drawings forming a part of this specification, Figure 1 is a side elevation of the wheel embodying my improvements with one half shown in section and partly broken away; Fig. 2 is a front or edge view, in diametrical section, on line 2—2, Fig. 1; Fig. 3 is a perspective view of a spring retaining ring; Fig. 4 is an elevation of the link by which the hub is yieldingly connected to a disk flange keyed to the shaft; Fig. 5 is a detail taken from the lower side of the axle, Fig. 2, showing the spring supporting sleeves, without the annular flanges at their ends.

Referring to the several parts of the wheel, illustrated in the drawings, by letters, A is the rim; B the spokes; C a cylinder containing the spoke sockets D, surrounding the hub; X the axle; E the axle-box; F the cylindrical sleeve fitting upon the axle-box; G the coaxial sleeve of larger diameter surrounding the axle box sleeve F; H the series of springs held between the sleeves F, G; as illustrated, the springs are arranged in rows of three, parallel with the axis and eight such rows at regular intervals around the hub in the space between the two sleeves. This number and arrangement is satisfactory for usual conditions, but can be varied to suit circumstances. These springs are secured to the axle box sleeve F at their inner ends by screws I, and for convenience the outer ends of the springs are retained in countersunk holes k' in a ring K, which fits closely within the coaxial sleeve G.

In Fig. 2, L, l', are annular flanges secured to the respective ends of the sleeves F, G, when desired, as they serve to aid in keeping out dust; but these flanges may be omitted as shown in Fig. 5. M is a disk flange upon the axle X at the inner side of the wheel, and when the driving power is applied to the axle, the disk M is keyed to the axle; and to cause the wheel to turn with the axle the spoke-socket ring C is connected to the disk M by means of two crank-like links N, one projecting end, n' of each of which engages a hole in the disk M, and the other projecting end, n^2 of each engages a hole in the cylinder C, thus compelling the cylinder C and connected parts of the wheel to turn with the disk M, but at the same time permitting the diametrical movement of the wheel in relation to the axle substantially at all times, due to the resilient action of the springs H. Another disk O is screwed upon the outer end of the axle and bears against the outer ends of the cylinder C and sleeves F, G or the flanges secured thereto, thus holding them and the other interior parts of the hub in proper position, each in relation to the others.

It will be observed that the spoke-socket cylinder C with the spokes and rim form a rigid wheel which is supported upon the axle-box E, by the interposed sleeves F, G, and springs H, the whole being held in place between and guided by the disks M, O. The springs H should be made sufficiently stiff to normally support the weight of the vehicle, and a customary load without compressing the springs, but whenever an excess of pressure is put upon the springs by the jolting caused by an uneven road, the springs below the axle will be compressed and those above the axle distended, and thus by their resilient action permit the rings and sleeves between the disks M, O, to move up and down, guided thereby in lines at right angles to the axle, giving an ease of motion equal, if not superior, to that of the pneumatic tire.

Whenever it is desired to remove the sleeves and springs, it is only necessary to jack up the axle and remove the outer disk O, when the sleeves with the springs may be readily withdrawn.

I claim:

1. In a resilient wheel, an axle-box adapted to turn upon the axle, a sleeve closely encompassing the said box and adapted to turn therewith, a coaxial sleeve of large diameter spaced from and encircling the axle-box sleeve and normally concentric therewith, a spoke socket cylinder embracing the coaxial sleeve, a series of spiral springs within said space secured at their inner ends to said axle box sleeve, and a spring retaining ring for the outer ends of said springs fitting within said coaxial sleeve and provided with holes countersunk on its outer surface through which the outer ends of the springs pass and are retained in the countersunk depressions.

2. In a resilient wheel having an axle-box normally free to turn upon the axle, a pair of coaxial sleeves of different diameters encompassing the axle-box and normally free to turn therewith, a spring retaining ring fitting within the outer sleeve, springs interposed between the two sleeves and attached at their ends to the inner sleeve and to the spring retaining ring, a cylinder provided with spoke sockets around the outer sleeve, a disk mounted on and fixed to the axle in position to bear against the inner end of the cylinder, a disk on the axle and bearing against the outer end of the cylinder, and a pair of crank-links, the opposite ends of which are journaled respectively in said inner disk and in the spoke-socket cylinder.

MARGARET E. KNIGHT.

Witnesses:
DAVID C. AHEARN,
WALTER ADAMS.