J. B. DRAHONOVSKY.

RESILIENT WHEEL.

APPLICATION FILED AUG. 19, 1914.

1,154,912.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

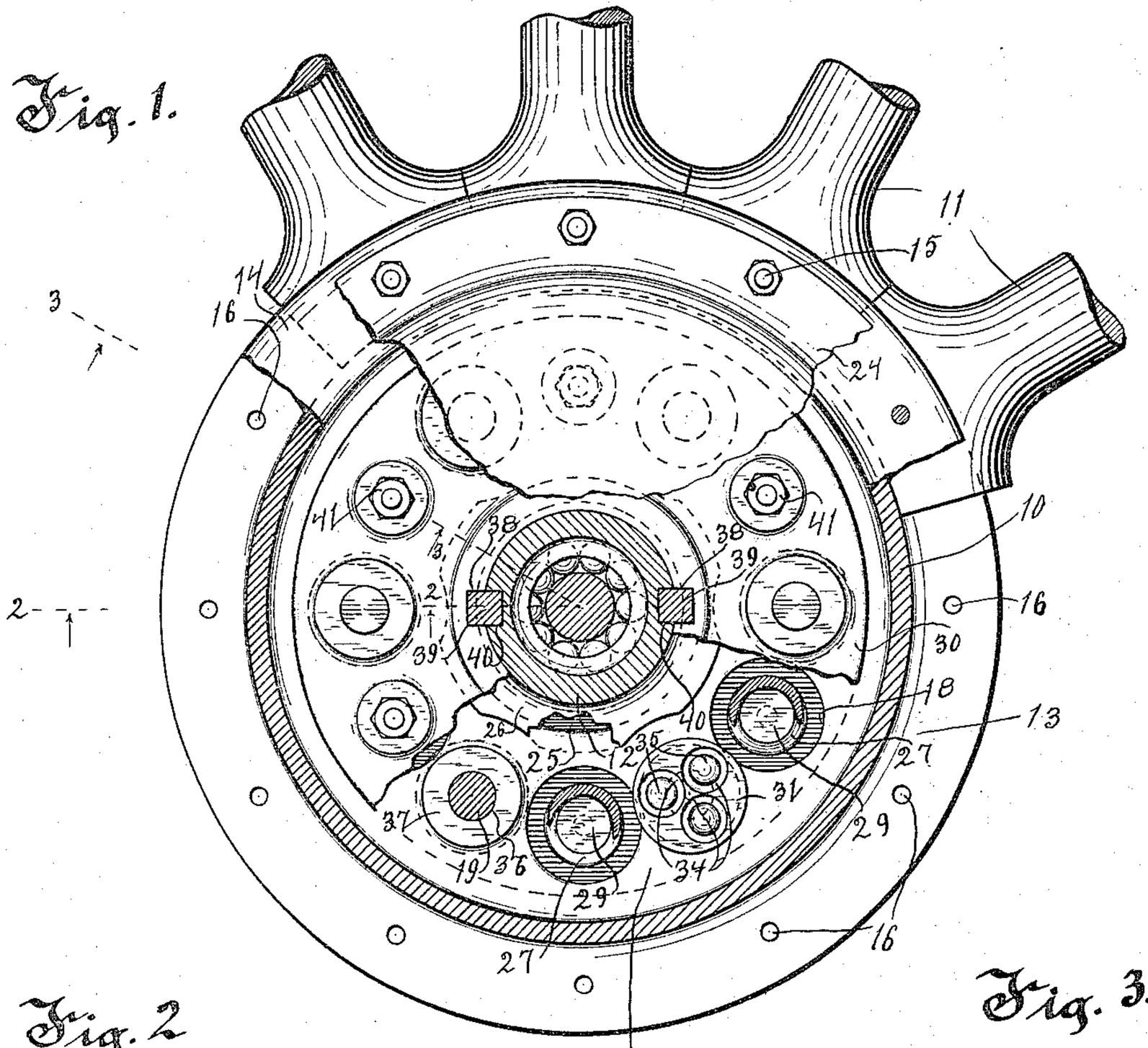


Fig. 2

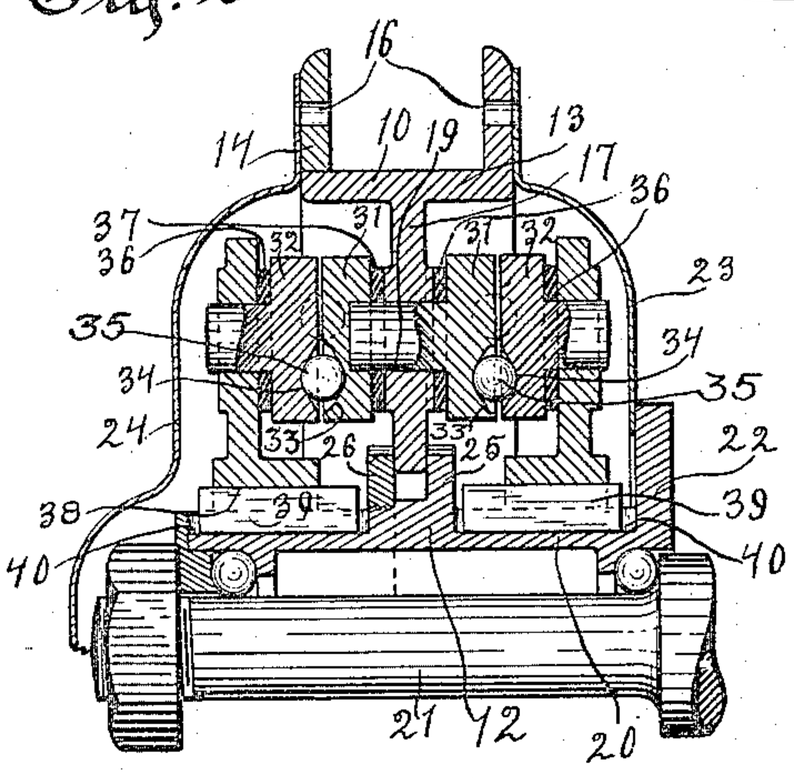
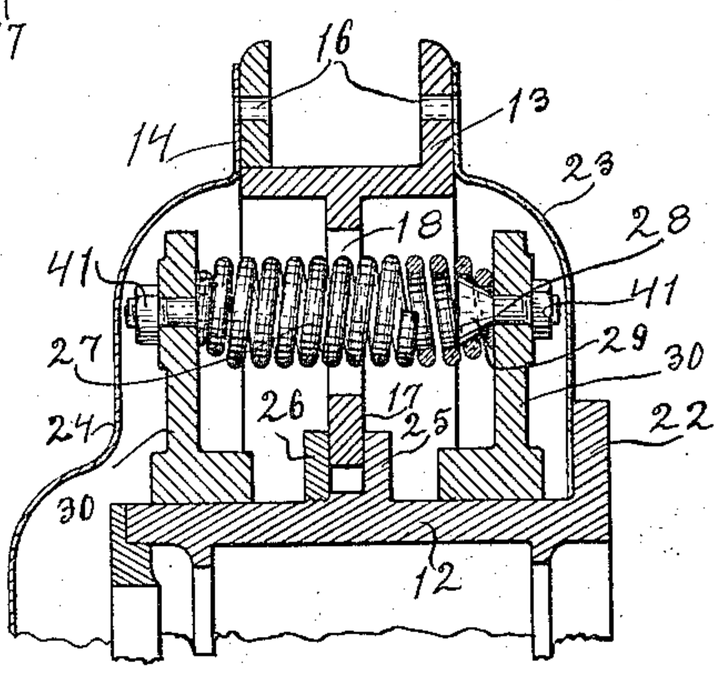


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 4.

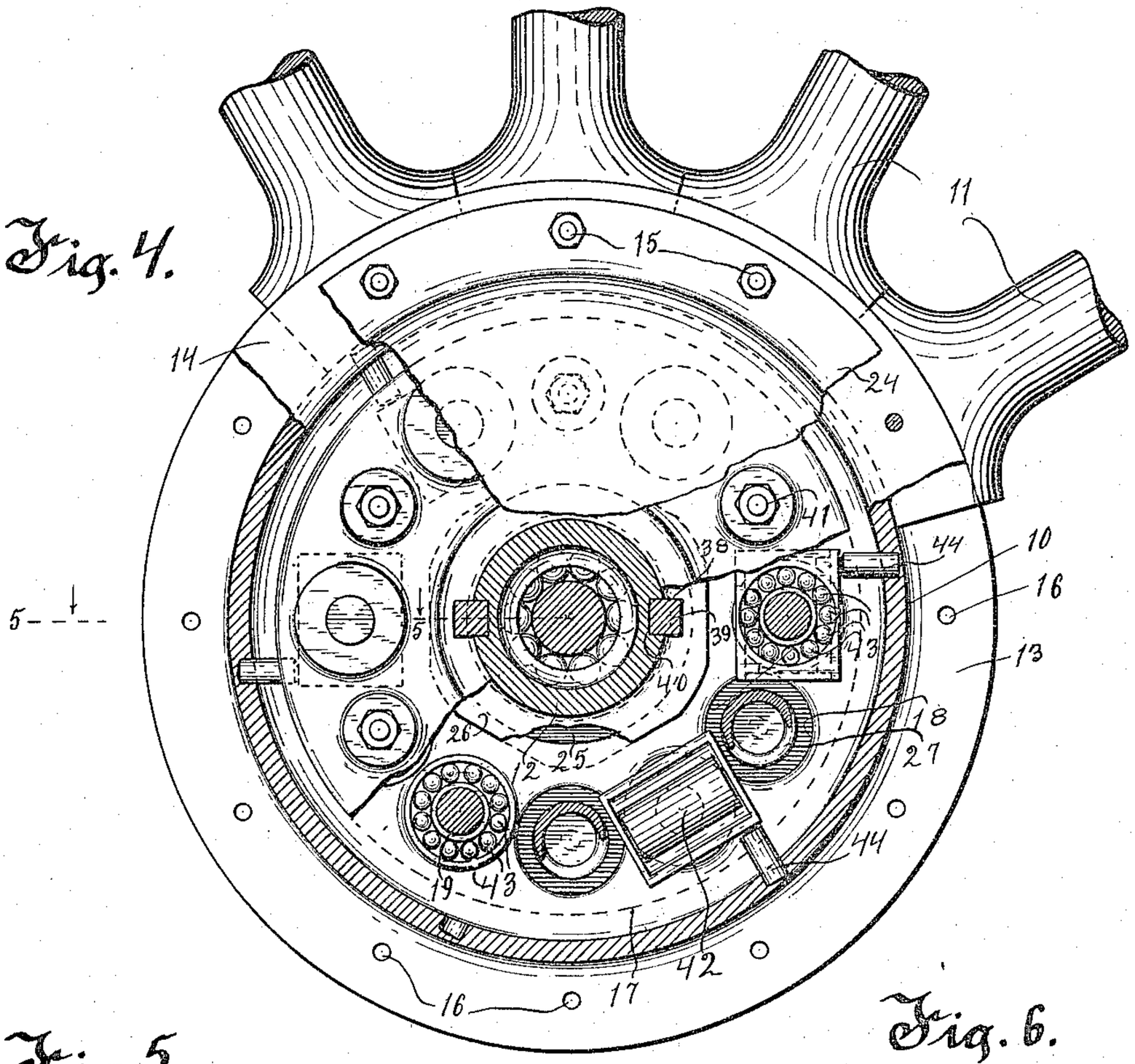


Fig. 5.

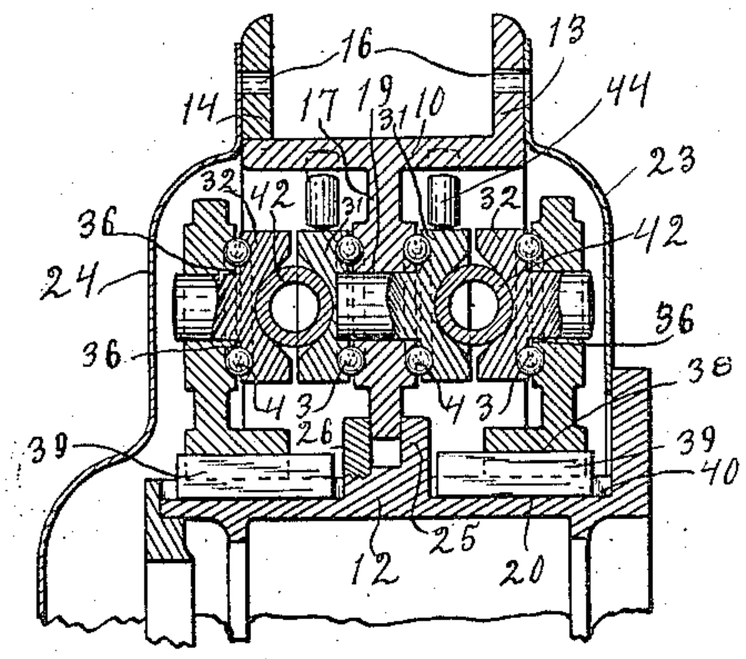
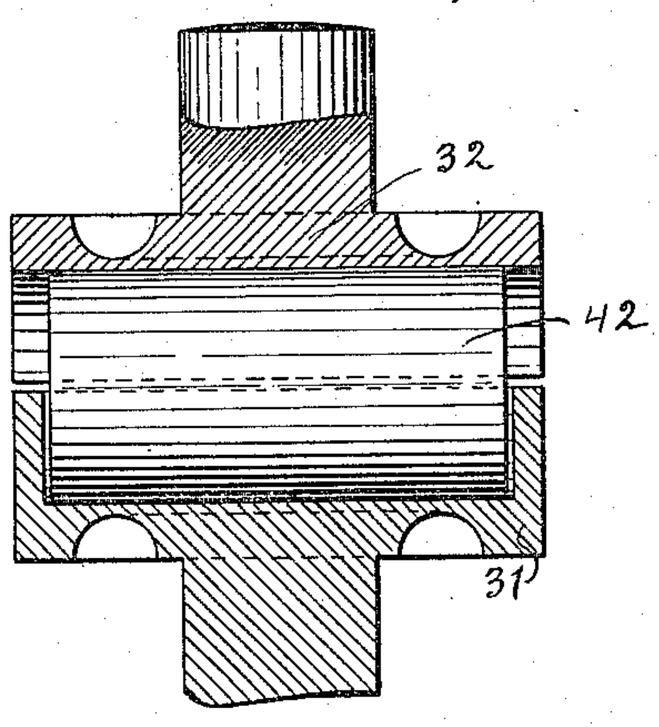


Fig. 6.



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UNITED STATES PATENT OFFICE.

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RESILIENT WHEEL.

1,154,912. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed August 19, 1914. Serial No. 857,439.

To all whom it may concern:

Be it known that I, JOHN B. DRAHONOVSKY, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Resilient Wheels, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

The invention relates to resilient wheels.

The invention designs to provide a resilient wheel of the spring type, having movable wheel members resiliently supported.

The invention further designs to provide a resilient wheel in which the hub portion of the wheel is yieldingly mounted within the wheel proper, to cushion the wheel against shocks and vibration due to the inequalities of the road traveled over.

The invention further designs to provide a resilient wheel having means for adjusting the tension of the resilient members.

The invention further designs to provide a resilient wheel whereby the strain of the load is equally distributed to all of the resilient members of the wheel.

The invention further designs to provide a resilient wheel comprising inner and outer hub members, and cushioning means between said hubs, comprising springs which are actuated by the movement of the hub members, and which are yieldingly supported upon sliding rings mounted upon the inner hub member, thus eliminating connecting bolts between the rings, which it has been found in practice are objectionable because of their tendency to twist and break off.

The invention further designs to provide a new and improved form of resilient wheel.

The invention consists in the several features hereinafter set forth, and more particularly defined by claims at the conclusion hereof.

In the drawings: Figure 1 is an elevation of the device embodying the invention (parts being broken away and shown in section); Fig. 2 is a section taken on the line 2—2 of Fig. 1; Fig. 3 is a section taken on the line 3—3 of Fig. 1; Fig. 4 is a view similar to Fig. 1, of a slightly modified form of the device; Fig. 5 is a section taken on the line 5—5 of Fig. 4; Fig. 6 is a detail sectional view through one of the roller bearings.

The device comprises an outer hub 10 which may be connected to the wheel rim by spokes 11, an inner hub 12, and means for yieldingly supporting the inner hub within the outer hub, and coöperating therewith, to cushion the wheel against shocks and vibrations, due to the inequalities of the road traveled over.

The outer hub 10 comprises a flanged ring member 13 upon which is seated a ring 14, the ring 14 and the flange of the ring 13 forming a space therebetween, for receiving the spokes of the wheel, which may be secured by bolts 15 passing through them and the apertures 16 in the members 13 and 14.

The flanged ring 13 is provided with a depending flange 17 having a series of apertures 18 and 19 therein, whose purpose is hereinafter described.

The inner hub 12 comprises a hub member 20, which is designed to fit upon the axle 21, and has a flange 22 at one end with which the casing 23 slidably engages, said casing being connected to the flanged ring 13. The front of the hub and the mechanism therein is inclosed by the casing 24, which fits over it, and is secured to the ring 14 of the outer hub. The inner hub is provided with an upwardly projecting ring portion or flange 25, and a ring 26 similar to the flange 25, is detachably secured to the hub 12, the ring 26 and flange 25 forming a space or guide for the lower edge of the downwardly projecting flange 17.

The means for cushioning the two hub members, comprises a plurality of horizontally disposed springs 27 extending through the apertures 18, and which are adjustably secured at their ends by means of bolts 28 having cone-shaped heads 29 to conform to the cone-shaped ends of the springs, to a pair of rings 30 which are slidably mounted upon the hub 12, and means are provided for transmitting the force exerted upon the outer hub to the springs, comprising bearing cup holding members 31 and 32 having recesses 33 and 34 positioned opposite to one another, to hold the bearings 35 therebetween. The bearing cup holding members 31 are secured to the flange 17, by pins passing through the apertures 19, while the bearing cup holding members 32 are secured to

the rings 30, said cup holding members being shouldered as at 36 in Fig. 2, and friction rings 37 being interposed between them and the rings 30 and flange 17. As previously pointed out, the rings 30 are slidably mounted upon the hub 12, and to prevent rotation relative thereto they are recessed as at 38, to receive keys 39 which are also mounted in key slots 40 in the hub 12.

The tension of the springs 27 may be adjusted by varying the length of the bolts 28 by means of the nuts 41, and in place of the ball bearings 35 shown in Figs. 1 and 2, roller bearings 42 shown in Figs. 4, 5 and 6, and ball bearings 43 may be used between the bearing holding cups and the rings and flange, in place of the friction rings 37, and rubber 44 may be inserted within the outer hub 10, to keep the cup holding members 32 in alinement.

The operation of the device is as follows: Any vertical movement of the outer or inner hubs with respect to each other, will cause a like movement of the flange 17 and rings 30, which are connected to them respectively, which will move the bearings 34 or 42, causing them to ascend or descend in their seats in the cup holding members. This will result in the exertion of a force tending to move the rings 30 outwardly and away from each other, which will be compensated for by an opposite force exerted by the springs 27. Thus for every force exerted upon the hub members, there will be a corresponding force exerted against the rings 30, which will be counteracted by the springs 27, and the springs being mounted upon the rings the force will be uniformly distributed among them. It will be noted that the rings 30 are free to move outwardly upon the keys 39 on the hub, and that by the same construction the rings 30 are prevented from rotating, so that there will be no twisting action exerted upon the springs 27, but simply a straight pull, and the use of connecting bolts between the rings 30 is eliminated. The invention thus exemplifies a resilient wheel comprising inner and outer hubs and cushioning means between the hubs, comprising a plurality of horizontally disposed springs which are supported at their ends on a pair of rings which are forced away from, or moved toward, each other, by the movement of the hub members.

What I claim is:

1. A resilient wheel comprising inner and outer hub members, a pair of rings slidably mounted upon said inner hub members, means for preventing rotation of the rings upon said members comprising a key, a plurality of tension springs interposed between said rings and fixedly secured thereto at their ends, and means on the other of said movable members and said rings, for permitting the rings to move outwardly against the action of said springs.

2. A resilient wheel comprising movable inner and outer hub members, one of said members having a depending flange, the other of said members having a pair of flanges forming a guideway therebetween for the depending flange of the other member, bearing cups carried by said depending flange, a ring on either side of said bearing cup holding flange, bearing cup holding members carried by said rings, bearings disposed in the cups formed by said cup holding members, and resilient means fixedly secured to the rings, whereby movement of the movable members will cause the rings to move outwardly against the action of said springs.

3. A resilient wheel comprising movable inner and outer hub members, one of said members having a depending flange, the other of said members having a pair of flanges forming a guideway therebetween for the depending flange of the other member, rings slidably mounted upon one of said members, a plurality of springs interposed between said rings and fixedly secured thereto at their ends, and means on the other of said movable members and said rings for permitting the rings to move outwardly against the action of said springs.

4. A resilient wheel comprising movable inner and outer wheel members, a sliding connection between said members, rings slidably but non-rotatably mounted upon one of said members, a plurality of tension springs interposed between said rings and fixedly secured thereto at their ends, and means on the other of said movable members and said rings for permitting the rings to move outwardly against the action of the springs.

5. A resilient wheel comprising movable wheel members, one of said members having a flange provided with a plurality of apertures, rings slidably but non-rotatably mounted upon the other of said members, a plurality of horizontally disposed tension springs interposed between said rings and fixedly connected thereto at their ends and passing through the apertures in said flange, and means on said flange and said rings for permitting the rings to move outwardly against the action of said springs.

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

JOHN B. DRAHONOVSKY.

Witnesses:
LOUIS O. FRENCH,
PETER LESCH.