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RESILIENT VEHICLE WHEEL
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Fig. 1

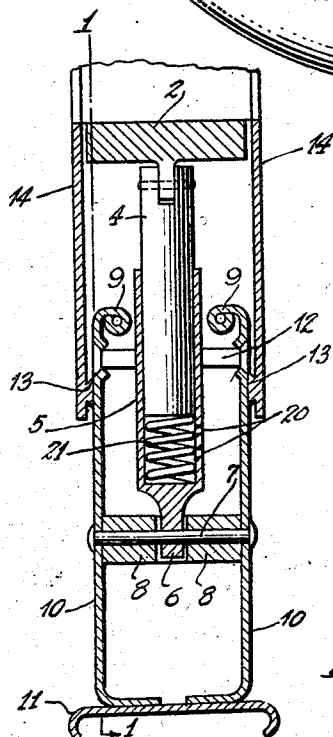
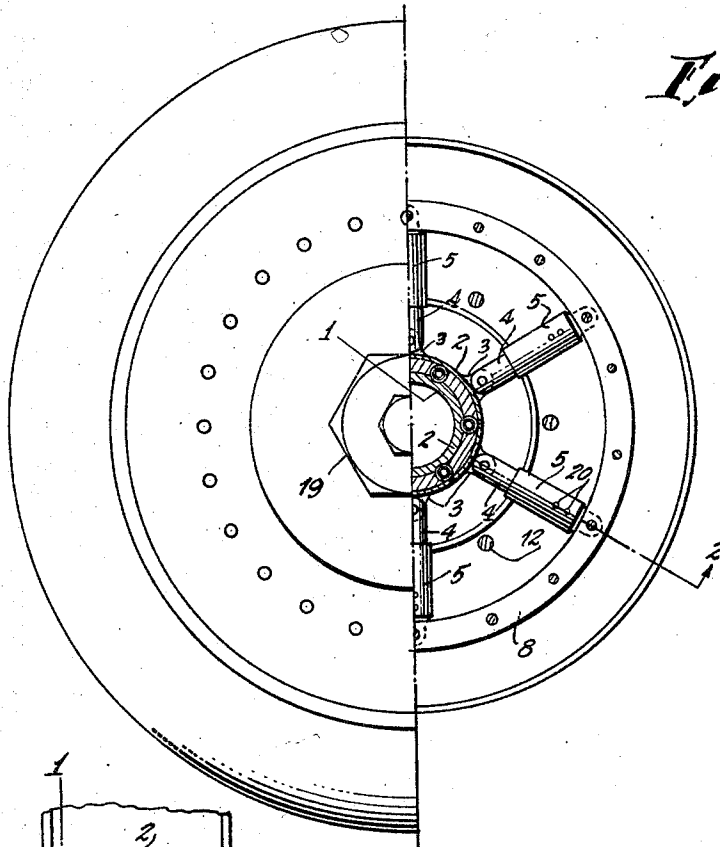


Fig. 2

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RESILIENT VEHICLE WHEEL.

Application filed March 9, 1926. Serial No. 93,439.

This invention is a resilient wheel, and, more particularly, a resilient disc wheel for motor vehicles.

The object of the invention is to provide a simple and highly efficient vehicle wheel of the disc type which may be used in conjunction with either pneumatic or solid tires and which, by virtue of its own inherent resiliency will absorb road shocks and vibration without relying upon the resiliency of the tire in the fulfillment of its function.

The wheel of this invention is unusually simple in construction, but, in practice, it is highly efficient in the performance of its intended functions. The parts are such that they will not be apt to get out of order and the wheel will function indefinitely in a thoroughly, efficient, practical and economical manner.

Features of the invention, other than those specified, will be apparent from the hereinafter detailed description and claims, when read in conjunction with the accompanying drawings.

The accompanying drawing illustrates one practical embodiment of the invention, but the construction therein shown is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 shows the wheel of the present invention partly in side elevation and partly in section on the line 1—1 of Figure 2.

Figure 2 is a section on the line 2—2 of Figure 1.

Referring to the drawings, 1 designates the hub of the wheel. On this hub is fitted a sleeve 2 which is provided at spaced intervals about its outer periphery with lugs 3, to which are pivoted pistons 4. Each of the pistons projects into a cylinder 5 and each of these cylinders is provided at its closed end with a boss 6 to receive a pin 7 which is secured to the ring 8 which may be referred to as the cylinder ring.

The ring 8 is tightly clamped between two annular discs 10, the outer peripheries of which carry the felly or rim 11 of the wheel, while the inner peripheries are inwardly curled or rolled as shown at 9. The ring 8 serves to space the discs 10 apart and said discs are secured to one another adjacent their inner peripheries by fastening bolts 12, which are positioned in interposed rela-

tion to the cylinders and constitute stops therefor as will be hereinafter more fully explained.

Secured to the opposite sides of the wheel and at the hub thereof are discs 14 of sufficient radius to overlap the inner margins of the annular discs 10. These discs 14 which may be termed supplemental discs serve to enclose the working parts of the wheel and exclude dust or other extraneous matter therefrom. The outer margins of the discs 14 bear against the inner margins of the discs 10 and are held in this position in any suitable manner.

To minimize friction, the discs 14 are provided on their inner faces and near their outer peripheries with annular ribs 13 adapted to bear against the outer faces of the discs 10. The ribs 13 are preferably undercut at their inner and outer peripheries to facilitate the attachment of any antifriction material if desired.

The disks 14 are secured to the hub or sleeve in any suitable manner to cause the ribs of the supplemental disks to be maintained at all times against the annular disks.

When the wheel of the character described is in place on the vehicle axle, the weight will be carried by the respective pistons. In practice, air escape openings 20 are provided near the base of each cylinder to permit of a slow escape of pressure and allow the parts of the wheel to come into coaxial relation.

When the wheel is allowed to remain at rest for a time, pressure in the cylinders, which are supporting the wheel, may leak out sufficiently to permit a sagging of the hub, and in order to preclude undue sagging of the hub at such time, I position within each cylinder a spring 21. These springs are sufficiently long to engage with the cylinder head and piston at all times and to assist the fluid pressure in the cylinder in supporting the weight of the car, while the wheel is rolling. These are springs which, moreover, are sufficiently strong to actually support the weight of the car without undue sagging of the axle, while the car is at rest, and in the event that the pressure is exhausted from the cylinders.

I thus provide a combined pneumatic and spring cushioned piston, the fluid pressure and the spring cooperating to produce very

easy riding qualities and serving to absorb shocks and jars which would otherwise be transmitted to the axle.

When the wheel is running free, i. e., when it is used for a front wheel of a motor vehicle, the pistons and cylinders will extend at all times in a truly radial direction. If the wheel is, however, used as a driving wheel, or if it is braked, there is a tendency of the hub to run away from the rim or the rim to run away from the hub. In either event, the extent to which this can occur is limited by the bolts 12 which will engage with the cylinders 5 and limit such relative rotation between the parts.

It is of advantage to provide for relative movement as described, since such relative movement is of a cushioned or yieldable character and not only produces more flexible braking, but also eliminates shocks due to uneven transmission of power to the hub from the prime mover of the vehicle, even though the transmission of power be unsteady, the fluctuations thereof will be, in effect, smoothed out while being transmitted to the rim of the wheel through the pistons and cylinders to which I have referred.

It will be noted from Fig. 2 in particular that the curled edges 9 of the discs 10 are positioned relatively close to the cylinders 5. The purpose of this construction is to adequately provide for lateral stability of the wheel, it being apparent that if lateral stresses are imposed on the wheel one or the other of the curled edges 9 will engage with the cylinders 5 and so efficiently support the wheel against the stresses imposed thereon that collapsing of the structure cannot possibly occur. Moreover, the structure is such that undue strains cannot be imparted thereto.

The operating parts of the wheel may be lubricated in any suitable manner, such, for example, as illustrated in detail in my co-pending application, Ser. No. 93,441, and I have not considered it necessary to detail the lubricating of the parts in the drawings of this case.

The foregoing detailed description sets forth the invention in its preferred practical form but the invention is to be understood as fully commensurate with the appended claims.

Having thus fully described the invention, what I claim as new and desire to secure by Letters Patent is:

1. A resilient wheel embodying a hub, a rim, spaced apart coaxial annular discs secured at their outer peripheries to the rim and extending toward the hub and terminating short of the hub, a ring positioned between and rigidly secured to the discs intermediate their inner and outer peripheries to space them apart thereat, a plurality of cylinders pivotally secured to said ring and ex-

tending in an inward radial direction, means for securing the annular discs to one another at their inner peripheries and intermediate successive cylinders, a plurality of pistons extending into the cylinders and pivotally associated with the hub, and a pair of supplemental discs positioned exteriorly of the annular discs with the outer marginal portions of the supplemental discs bearing against the inner marginal portions of the annular discs to cover and conceal the interior operating parts of the wheel.

2. A resilient vehicle wheel embodying a hub, a rim, spaced apart annular discs secured at their outer peripheries to the rim and provided at their inner peripheries with inturned stop flanges spaced from the hub, a ring positioned between and rigidly secured to said discs intermediate their inner and outer peripheries, a plurality of cylinders pivotally secured to the ring and extending in inward radial directions and in relatively close proximity to the limiting flanges of said discs, said flanges serving to engage with the cylinders to impart lateral stability to the wheel when it is subjected to lateral stresses, and a plurality of pistons pivotally associated with the hub and extending into said cylinders.

3. A resilient vehicle wheel embodying a hub, a rim, spaced apart annular discs secured at their outer peripheries to the rim and provided at their inner peripheries with inturned stop flanges spaced from the hub, a ring positioned between and rigidly secured to said discs intermediate their inner and outer peripheries, a plurality of cylinders pivotally secured to the ring and extending in inward radial directions and in relatively close proximity to the limiting flanges of said discs, said flanges serving to engage with the cylinders to impart lateral stability to the wheel when it is subjected to lateral stresses, a plurality of pistons pivotally associated with the hub and extending into said cylinders, tie rods for securing the inner peripheries of said discs to one another, said rods being positioned intermediate the successive cylinders and adapted to be engaged thereby to preclude pivotal movement of the cylinders beyond predetermined limits in the plane of the wheel.

4. A resilient vehicle wheel embodying a hub, a rim, spaced apart annular discs secured at their outer peripheries to the rim and provided at their inner peripheries with inturned stop flanges spaced from the hub, a ring positioned between and rigidly secured to said discs intermediate their inner and outer peripheries, a plurality of cylinders pivotally secured to the ring and extending in inward radial directions and in relatively close proximity to the limiting flanges of said discs, said flanges serving to engage with the cylinders to impart lateral stability

to the wheel when it is subjected to lateral stresses, a plurality of pistons pivotally associated with the hub and extending into said cylinders, tie rods for securing the inner peripheries of said discs to one another, said
5 rods being positioned intermediate the successive cylinders and adapted to be engaged thereby to preclude pivotal movement of the cylinders beyond predetermined limits in the plane of the wheel, supplemental discs se- 10 cured to the hub with their outer margins bearing against the inner margins of the annular discs to enclose and conceal the operating parts of the wheel.

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