

H. L. McDUFFEE.
RESILIENT WHEEL HUB.
APPLICATION FILED FEB. 10, 1910.

981,297.

Patented Jan. 10, 1911.

2 SHEETS—SHEET 1.

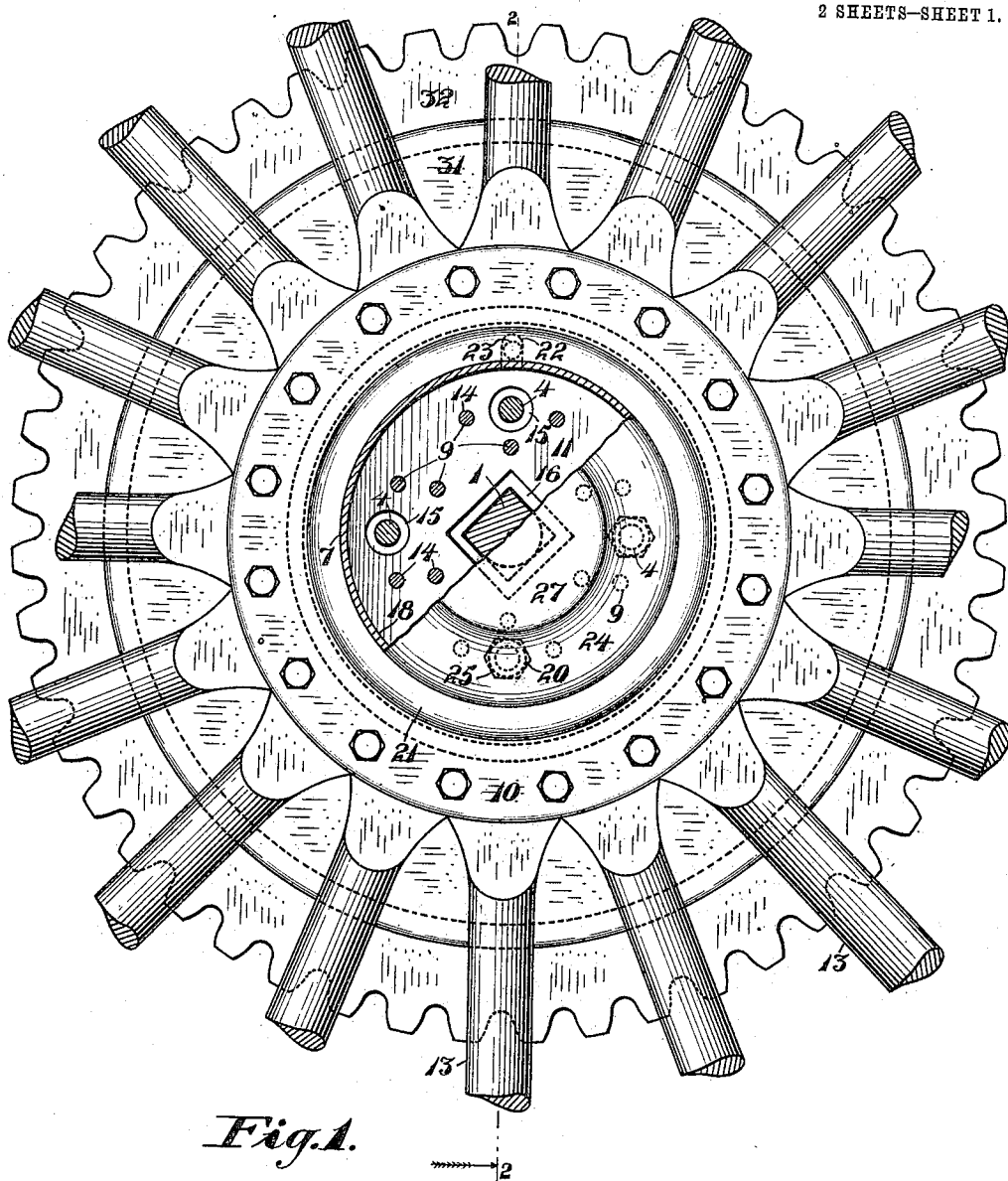


Fig. 1.

WITNESSES:

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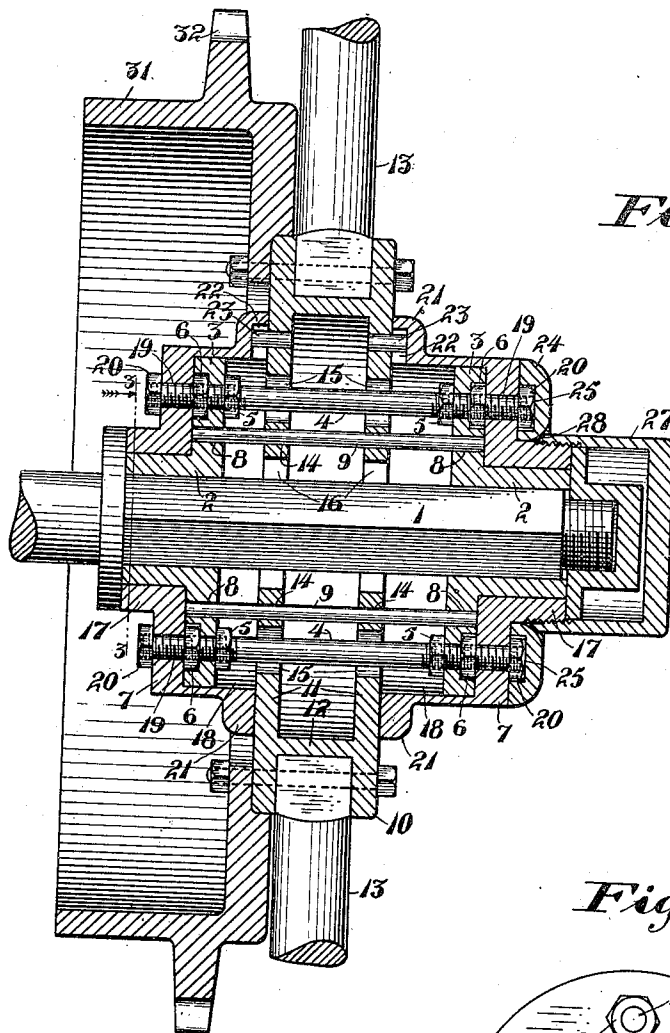


Fig. 2.

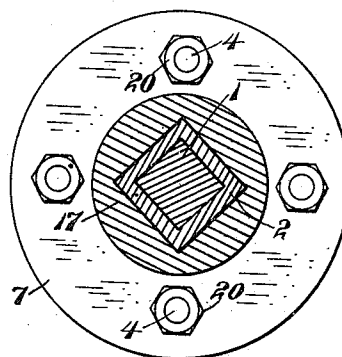


Fig. 3.

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UNITED STATES PATENT OFFICE.

HENRY L. McDUFFEE, OF GILROY, CALIFORNIA.

RESILIENT WHEEL-HUB.

Specification of Letters Patent.

Patented Jan. 10, 1911.

981,297.

Application filed February 10, 1910. Serial No. 543,083.

To all whom it may concern:

Be it known that I, HENRY L. McDUFFEE, a citizen of the United States, residing at Gilroy, in the county of Santa Clara and State of California, have invented new and useful Improvements in Resilient Wheel-Hubs, of which the following is a specification.

This invention relates to resilient wheel hubs, and its object is to provide a device of this character so constructed as to avoid the breaking of the springs upon which its resiliency depends, also to provide means for turning the hub with the axle and con-
versely, which will not affect its resiliency, also one which will be dust proof and attractive in appearance, also one in which the parts which carry the springs are securely attached to the hub and in effect from one frame therewith independent of the springs.

In the accompanying drawing, Figure 1 is a side view, partly broken away, of the wheel; Fig. 2 is an axial section on the line 2-2 of Fig. 1; Fig. 3 is a detail section on the line 3-3 of Fig. 2.

Referring to the drawing, 1 indicates an axle having boxes 2, each box being formed with a circular disk 3 at its inner end, secured to each other by bolts 4, having on the inside of the disks nuts 5, and on the outside nuts 6, and extending beyond said nuts 6 to connect the outer shells 7 hereinafter described. By means of said bolts and nuts, of which there are here shown four in number, although there may be any desired number, said disks are rigidly secured together, and at the same time spaced from one another.

Each disk is formed with two concentric rings of holes 8, registering with, or opposite to, each other and in said holes are contained the ends of spring rods 9, of a length equal to a distance from each other of the outer sides of the disks. 10 indicates the hub proper which consists of two plates 11 transverse to the axle and connected by a ring 12 at a suitable distance from the axle, and at a depth below the edges of the plates to receive the ends of the spokes 13, said plates and ring being all cast in a single piece. The spokes are received between said plates, and abut against said ring in a manner similar to that now in use. Through said plates are formed holes 14 opposite to, or in register with, the holes 8 in the disks 3, and

the springs, the ends of which are contained by said links 3, pass through said holes 14.

The construction of the hub with two plates which bear upon the spring rods at points spaced apart from each other, is an important feature of my invention. Heretofore, when such spring rods have been used, and the hub rested directly on said rods, it so rested on one point only of each rod, at approximately the middle point thereof. The disadvantage of this construction was that the amplitude of oscillation of the hub, and therefore of the part of the vehicle supported thereby, was the same as that of the spring rod which momentarily supported the hub, and was therefore too great. For it is necessary that these spring rods should have considerable amplitude of oscillation, in other words, be quick-acting springs. By supporting the hub at two points on each spring rod, as shown in the drawing, the extent of vibration is reduced about one-half without diminishing responsiveness of the springs to variations of load. The device is therefore better adapted for the purpose intended, namely, as a shock absorber, than is the prior construction. A further disadvantage of the former construction is that, by continual bending owing to force applied at the middle point, the springs soon become crystallized and break. With my improved construction this result is avoided.

Said plates are likewise formed with large holes 15 through which the bolts pass, said holes being of sufficient size that said plates can freely reciprocate on said spring rods without coming into contact with said bolts. It is also formed with a central hole 16 for the axle which is also much larger than the axle, for the same reason. Thus the springs can take up the shock upon the spokes and transmit the pressure to the axle without jarring, since the hub proper does not come in contact with any part but the springs.

Upon the boxes are secured the shells 7, each having a reduced portion 17, and having a central square hole to fit the square box, having also a cylindrical portion 18 of enlarged diameter to fit closely around the edge of the disk, and of sufficient width to contact with the corresponding plate 11 of the hub proper. Each shell is formed with holes 19 corresponding in position with the bolts 4, and the ends of said bolts pass

through said holes and nuts 20 are screwed on the outside thereof firmly securing the shell in position in contact with the plate 11 of the hub proper. Next to said plate the shell has a rim or flange 21 which fits snugly against the plate. It is important that these rims should fit snugly against the hub, and yet not so tightly as to bind thereupon. By means of the inner and outer nuts 5, 6, and also the nuts 20, this can be accomplished, for the position of the disks can be accurately adjusted, and the shells can be screwed up closely against the disks. Said flange is formed with a radially elongated recess 22, into which enters a stud 23 extending outward from the plate. The function of this stud is to maintain the hub proper and the axle in position against any relative angular movement of one with reference to the other. This is an important feature of my invention, as otherwise it would be necessary to rely upon the springs to perform this function. But if the springs are made strong enough to maintain the axle and wheel in proper relative position, they do not have sufficient resiliency; and if they are given sufficient resiliency, they will break from the strain thus imposed upon them. In my invention, I use the springs simply for the purpose of absorbing the shock or jar on the wheel, and not for the purpose of maintaining the wheel and axle in proper relative position, for this purpose employing the device just above described. The slot is elongated in order that, while maintaining the wheel and axle in their proper relative angular positions, they may move radially with reference to one another, as permitted by the resiliency of the springs.

For the purpose of preventing the nuts 20 becoming loose, I provide a ring 24, preferably half round in cross section, which ring is passed over the reduced rounded portion of the shell, so as to fit against its outer face. Said ring is formed with recesses 25 corresponding in number and position to the

bolts, and the nuts are so turned that when said ring is placed upon the shell, the nuts fit snugly in said recesses. Therefore if said ring is retained upon the shell, the nuts 20 cannot turn upon the bolts.

In order to retain the ring in position, the reduced portion of the shell is threaded, and upon said threaded portion is screwed a cap 27 having the outer edge at the inner end beveled, as shown at 28, so that when said cap is screwed on the reduced portion of the shell, it enters between the rounded inner edge of the ring and said threaded portion, and is pressed firmly inward and thereby locks the ring in position.

To the hub may be attached a friction drum 31 having a gear 32 thereon for propelling the wheel.

I claim:—

The combination of an axle, disks fitting closely around the axle, spring rods having their ends in recesses in the disks, a hub having two parallel plates spaced from each other, and from the disks, each having holes through which the spring rods pass, whereby said hub is supported on said rods at two points spaced apart on each, bolts, threaded at each end, and passing through said disks, inner and outer nuts screwed on each end of each bolt against the surface of the disk at said end, said plates having holes, larger than the bolts, through which they pass, shells around the disks and having flanges fitting against the outer sides of the hub, said bolts passing through said shells, nuts secured upon the ends of the bolts, and pins secured to, and extending outward from the hub, said shell having radial recesses to receive said pins.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY L. McDUFFEE.

Witnesses:

FRANCIS M. WRIGHT,
D. B. RICHARDS.