C. E. WADE & C. J. LAGERWALL.

AUTOMOBILE WHEEL WITH PNEUMATIC AND SPRING HUB.

APPLICATION FILED OCT. 19, 1910.

995,502. Patented June 20, 1911.

2 SHEETS—SHEET 1.

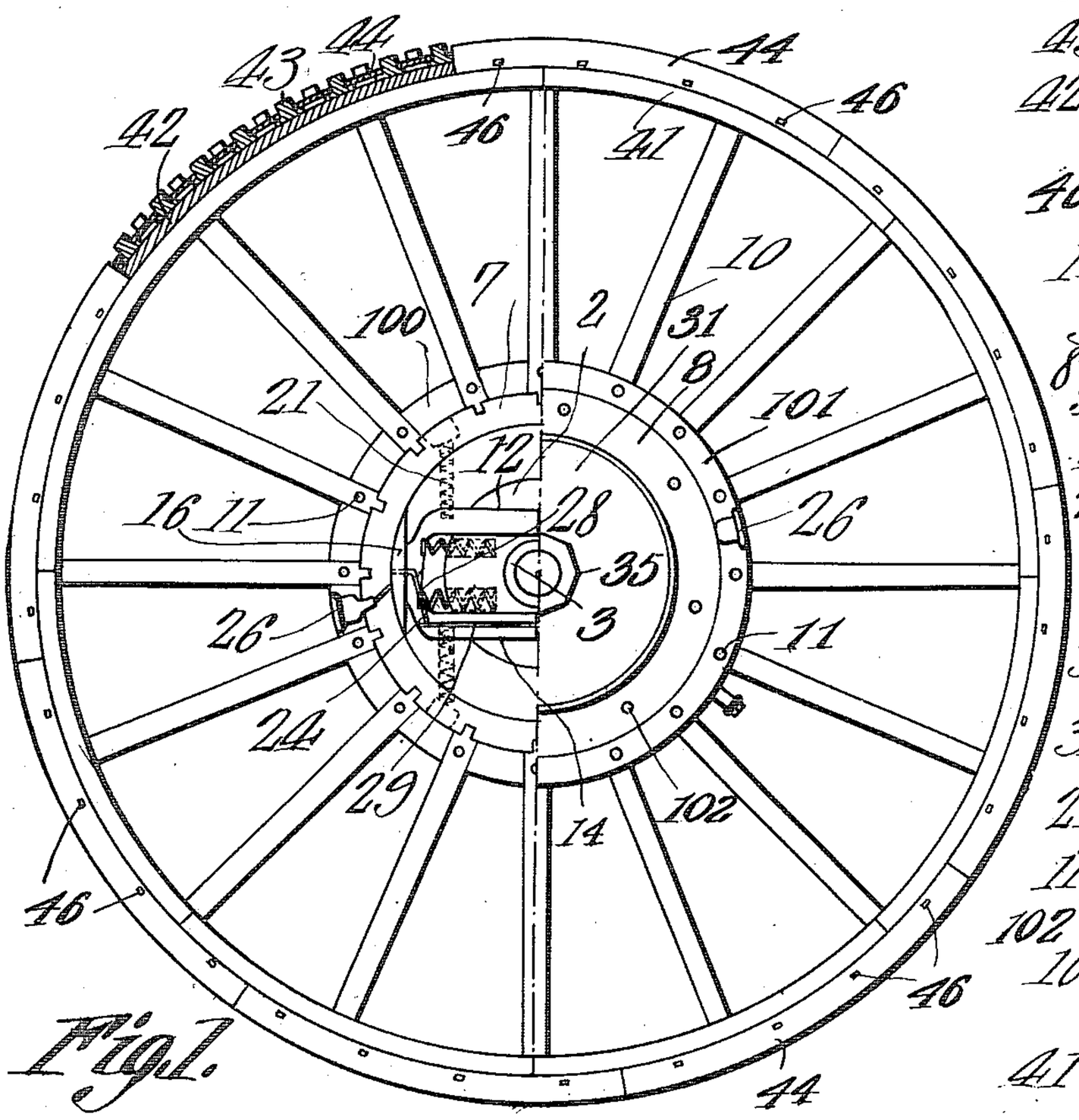

Fig. 1.

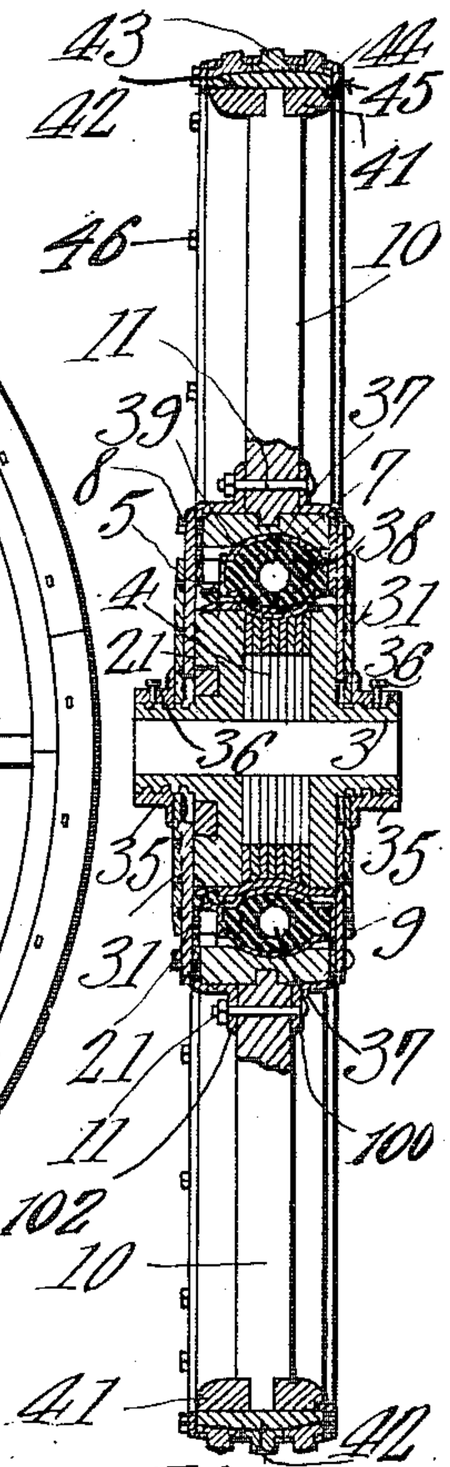

Fig. 2.

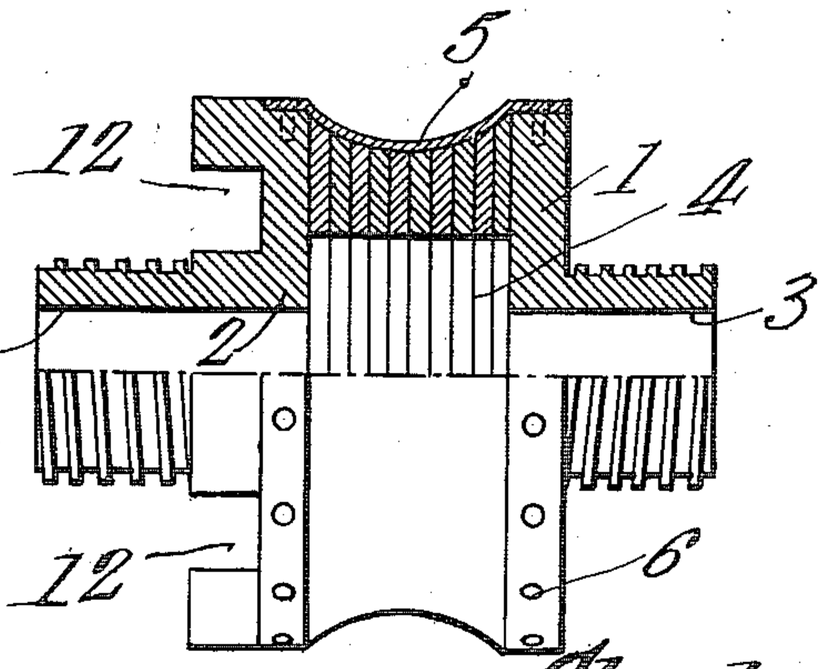

Fig. 3.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

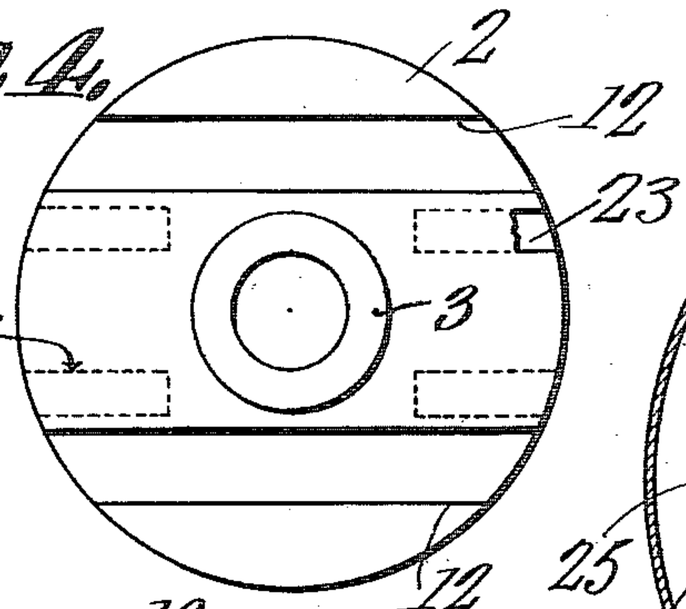
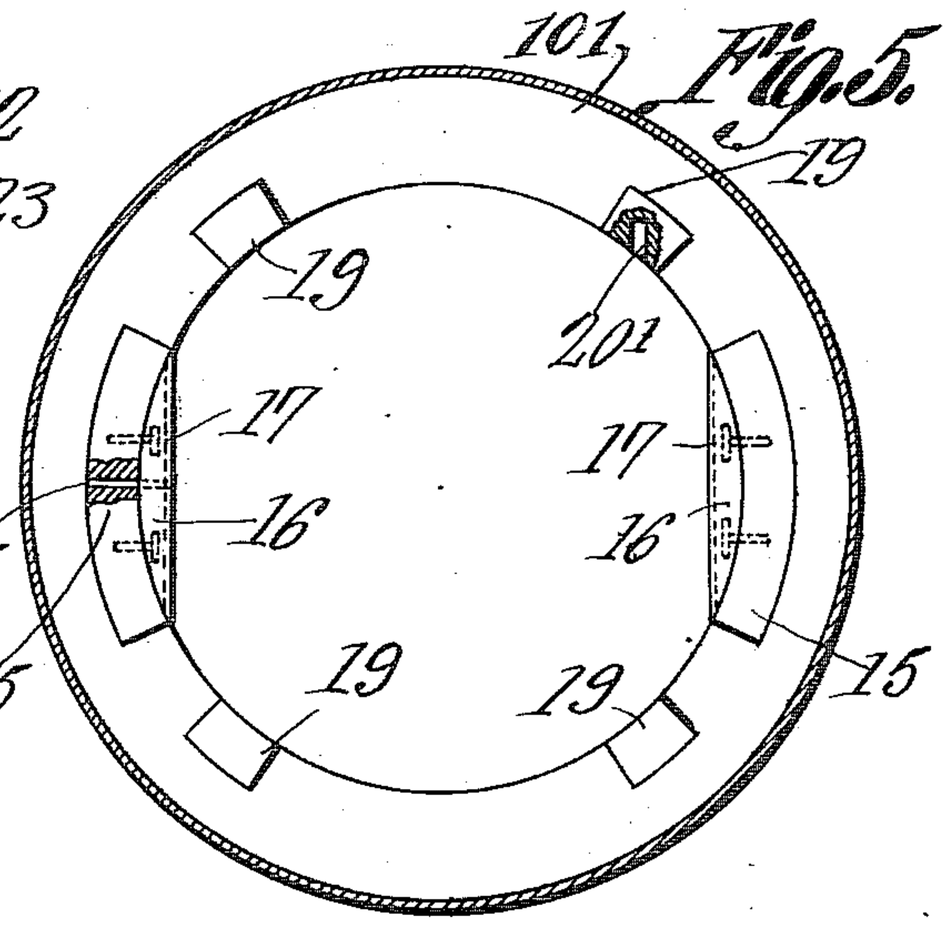


Fig. 5.



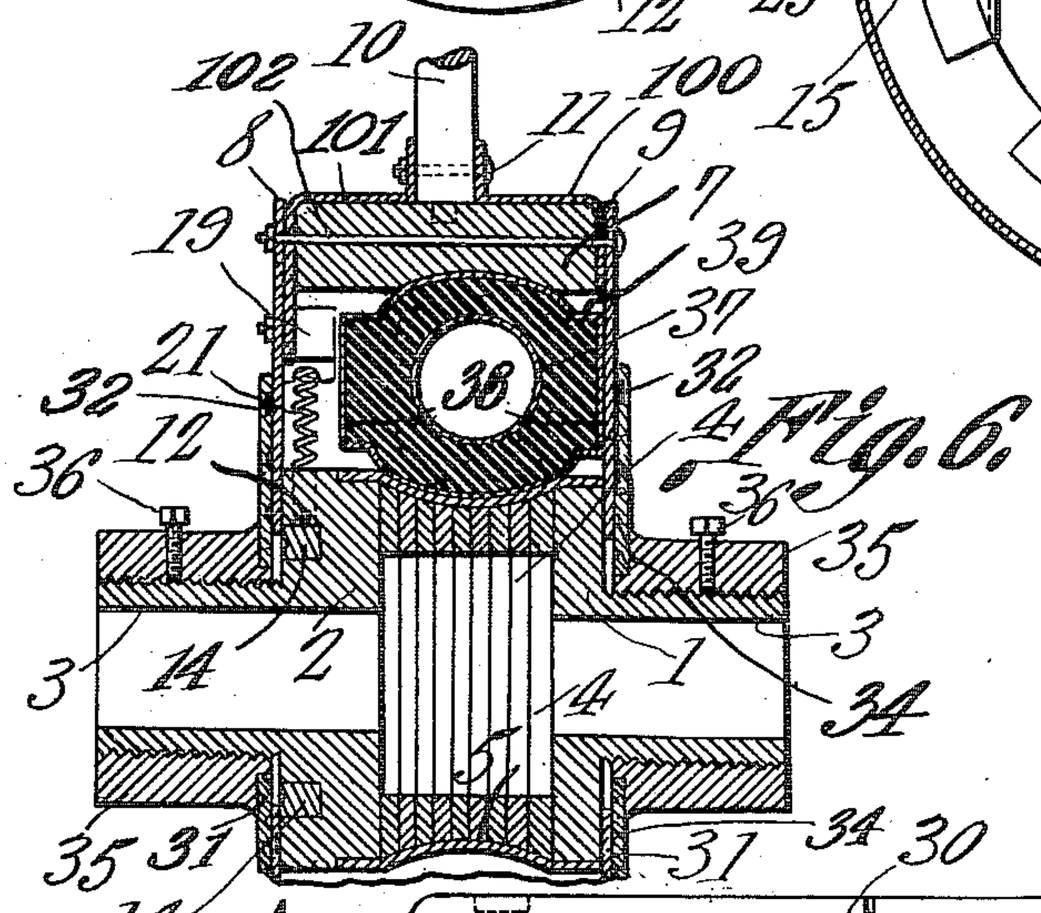


Fig. 6.

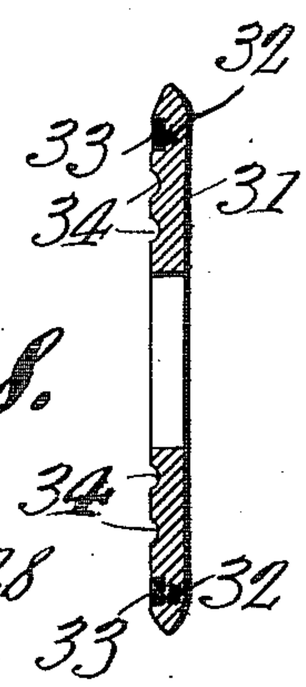


Fig. 8.

Fig. 11.

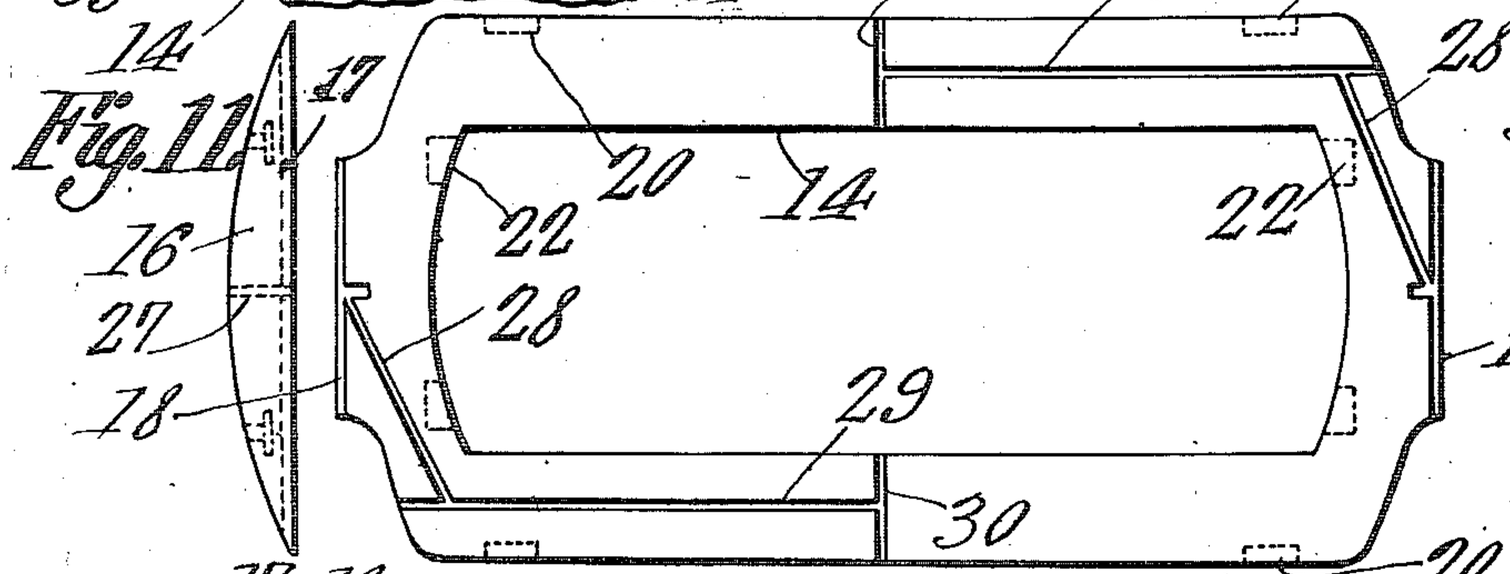


Fig. 7.

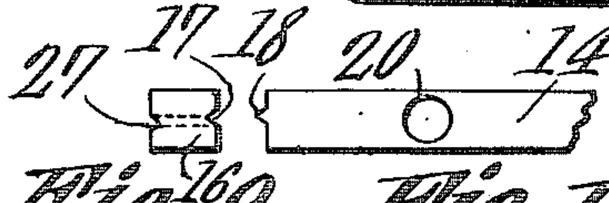


Fig. 9. Fig. 10.

Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES E. WADE, OF MASONVILLE, AND CHARLES J. LAGERWALL, OF NEW YORK, N. Y.

AUTOMOBILE-WHEEL WITH PNEUMATIC AND SPRING HUB.

995,502. Specification of Letters Patent. Patented June 20, 1911.

Application filed October 19, 1910. Serial No. 587,905.

To all whom it may concern:

Be it known that we, CHARLES E. WADE and CHARLES J. LAGERWALL, citizens of the United States, residing, respectively, at Masonville and New York, in the counties of Delaware and New York, State of New York, have invented a new and useful Automobile-Wheel with a Pneumatic and Spring Hub, of which the following is a specification.

It is the object of this invention to provide a resilient wheel so constructed that the ordinary rim wherewith pneumatic tires are employed, may be dispensed with.

Another object of the invention is to provide novel means for creating a resilient structure in a wheel, without the use of pneumatic, or other spring tires.

Another object of the invention is to improve generally, devices of the class to which this invention appertains, and to provide novel means for operatively connecting the several component elements of the structure.

Another object of the invention is to provide novel means whereby the friction between the component elements of a resilient wheel may be reduced.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings,—Figure 1 shows the invention in side elevation, parts being broken away and sectioned; Fig. 2 is a transverse central section of the wheel; Fig. 3 is an elevation of the inner hub, parts being broken away and sectioned; Fig. 4 is a side elevation of the inner hub; Fig. 5 is a sectional elevation of one of the spoke flanges; Fig. 6 is a fragmental transverse section of the device, enlarged from Fig. 2; Fig. 7 is a side elevation of the movable member whereby the inner and outer hubs are held against independent rotation; Fig. 8 is a transverse section of one of the securing plates; Fig. 9 is an end elevation of one of the guides; and Fig. 10 is a fragmental edge elevation of the movable member shown in Fig. 7; Fig. 11 is a side elevation of one guide.

The invention includes, as a primary and fundamental element, an inner hub, shown in clearest details in Fig. 3. This inner hub is composed of two side members 1 and 2, each of which is provided with a laterally extended externally threaded portion 3. Between the side members 1 and 2, a plurality of rings 4, preferably fashioned from wood, are interposed. A band 5, ordinarily fashioned from rolled steel, is extended around the rings 4, this band 5 overlapping the edges of the side members 1 and 2. Adjacent its edges, the band 5 is secured to the side members 1 and 2 by screws 6 or other securing devices adapted to a like end.

The inner hub, as above described, is inclosed by an outer hub, this outer hub consisting of an auxiliary rim 7, cover plates 8 and 9, and spoke flanges 100 and 101. The spokes 10 are bolted as at 11, between the spoke flanges 100 and 101, the spoke flanges in their turn being bolted, as at 102 (see Fig. 6) to the auxiliary rim 7. The cover plates 8 and 9 are likewise held in place upon the auxiliary rim 7 by means of these bolts 102. The cover plates 8 and 9 are carried toward the center of the wheel, so as to overlap the outer faces of the side members 1 and 2 of the inner hub. The inner hub, however, is slidable between the cover plates 8 and 9, in the plane of the wheel.

Referring particularly to Figs. 3 and 4, it will be seen that the side member 2 of the inner hub is provided with transverse, parallel guideways 12 in which a frame 14, hereinafter referred to as the movable member is adapted to slide in a fixed direction. The spoke flange 101 carries lugs 15, projecting toward the vertical center of the wheel. To these lugs 15, guides 16 are secured in any desired manner. These guides 16 are provided with longitudinally extended grooves 17, adapted to receive tongues 18, outstanding from the ends of the frame or movable member 14. From the foregoing it will be seen that the frame 14 is slidable in the guideways 12 of the side member 2 of the inner hub, in one direction, and likewise slidable in the grooves 17 of the guides 16 in another, rectangularly disposed direction.

The spoke flange 101, in addition to the lugs 16, is provided with other lugs 19, of which lugs 19 there are preferably although not necessarily four. Referring to Figs. 7 and 10, it will be seen that in the frame 14, adjacent the ends thereof, there are seats 20, also seats 20′ in the lugs 19 as seen to best advantage in Fig. 5. The ends of compression springs 21 are terminally mounted in the seats 20 and 20′. These springs 21 serve to limit the sliding movement of the frame 14 in the guides 16. In the inner faces of the ends of the frame 14 there are seats 22, alined with seats 23 in the side member 2 of the inner hub. In these seats 22 and 23, compression springs 24 are terminally mounted. These compression springs 24 serve to limit the sliding movement of the frame 14 in the guideways 12 in the side member 2 of the inner hub.

In the lugs 15 of the spoke flange 101, there are oil ducts 25, supplied from a cup 26 disposed between certain of the spokes. These oil ducts 25 communicate with oil ducts 27 in the guides 16, the oil ducts 27 in their turn, being adapted to communicate with oil ducts formed in one side face of the frame 14 as clearly seen in Fig. 7. These oil ducts in the frame 14 extend, as shown at 28, transversely of the frame, and thence, as shown at 29, longitudinally of the frame, to communicate with transverse ducts 30, which said ducts 30 discharge in the guideways 12, between the frame 14 and the side member 2 of the inner hub. From the foregoing it will be seen that the frame is lubricated where it slides in the guides 16, and likewise lubricated where it slides in the guideways 12 in the side member 2 of the inner hub.

As hereinbefore pointed out, the inner hub is adapted to move in the plane of the wheel between the side plates 8 and 9, the inner hub being yieldingly supported by means of the springs 21 and 24. In order to reinforce the cover plates 8 and 9, securing plates 31 are slipped over the threaded portions 3 of the inner hub, to bear against the cover plates 8 and 9, without, however, interfering with the movement of the inner hub in the plane of the wheel and under the yielding of the springs 21 and 24. These securing plates 31, referring particularly to Fig. 8, are provided, adjacent their peripheries, with grooves 32 in which packing rings 33 are seated, these packing rings preventing dust and dirt from finding its way into the interior of the hub structure. Disposed between the grooves 32 and the centers of the securing places 31, are other concentric oil-receiving grooves 34. These securing plates 31 are held in place by means of nuts 35, threaded upon the portions 3 of the inner hub. These nuts 35 are held in place against rotation, by means of hub-engaging securing devices, preferably taking the form of set screws 36, threaded into the nuts 35 radially of the same.

An auxiliary means is provided, in addition to the springs 21 and 24, for spacing the auxiliary rim 7 of the outer hub from the side members 1 and 2 of the inner hub. This auxiliary spacing means preferably takes the form of a pneumatic tire 37, provided at its sides with thickened, reinforcing strips 38. This pneumatic tire 37 is received by the band 5, and by the auxiliary rim 7, both of which are oppositely concaved for the reception of the tire. The tire 37 is inclosed by an oil proof cover 39.

The outer ends of the spokes 10 are mounted in a felly 41, the felly 41 carrying a plate 42, upon which are placed a plurality of rectangular plugs 43, adapted to project through openings in a strap 44, ordinarily made in six or eight sections, one edge of the strap being clenched upon the strap 44 as shown at 45, and the other edge of the strap 44 being held in place by bolts 46. This tire structure last above described, may be modified in many ways as dictated by the exigencies of traffic, without impairing the utility of the remaining portions of the device.

Having thus described the invention what is claimed is:—

1. In a device of the class described, an inner hub; an auxiliary rim; a movable member seated in the hub for sliding movement in one direction; a plate applied to the rim and provided with inwardly projecting lugs; guides secured to the lugs and adapted to receive the movable member for sliding movement in another direction; yieldable means for limiting the sliding movement of the movable member; there being communicating oil ways in the guides and in the movable member accessible from the exterior of the device, and discharging between the movable member and the hub.

2. In a device of the class described, an inner hub and an auxiliary rim; a movable member seated in the hub for sliding movement in one direction; a plate applied to the rim and provided with inwardly projecting lugs; guides secured to the lugs and adapted to receive the movable member for sliding movement in another direction; resilient means connecting the plate and the movable member to limit the sliding movement of the latter with respect to the plate; resilient means connecting the movable member and the hub to limit the sliding movement of the movable member with respect to the hub; there being communicating oil ways in the guides and in the movable member accessible from the exterior of the device, and discharging between the movable member and the hub.

3. In a device of the class described, an inner hub and an auxiliary rim; a movable

member seated in the hub for sliding movement in one direction; a plate applied to the rim; guides carried by the plate and adapted to receive the movable member for sliding movement in another direction; resilient means connecting the plate and the movable member to limit the sliding movement of the latter with respect to the plate; resilient means connecting the movable member and the hub to limit the sliding movement of the movable member with respect to the hub; there being communicating oil ways in the guides and in the movable member, accessible from the exterior of the device, and discharging between the movable member and the hub.

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of witnesses.

CHARLES E. WADE.
CHARLES J. LAGERWALL.

Witnesses as to Chas. E. Wade:
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J. H. FREDENBERG.
Witnesses as to Chas. J. Lagerwall:
SAMHEL F. COLEMAN,
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