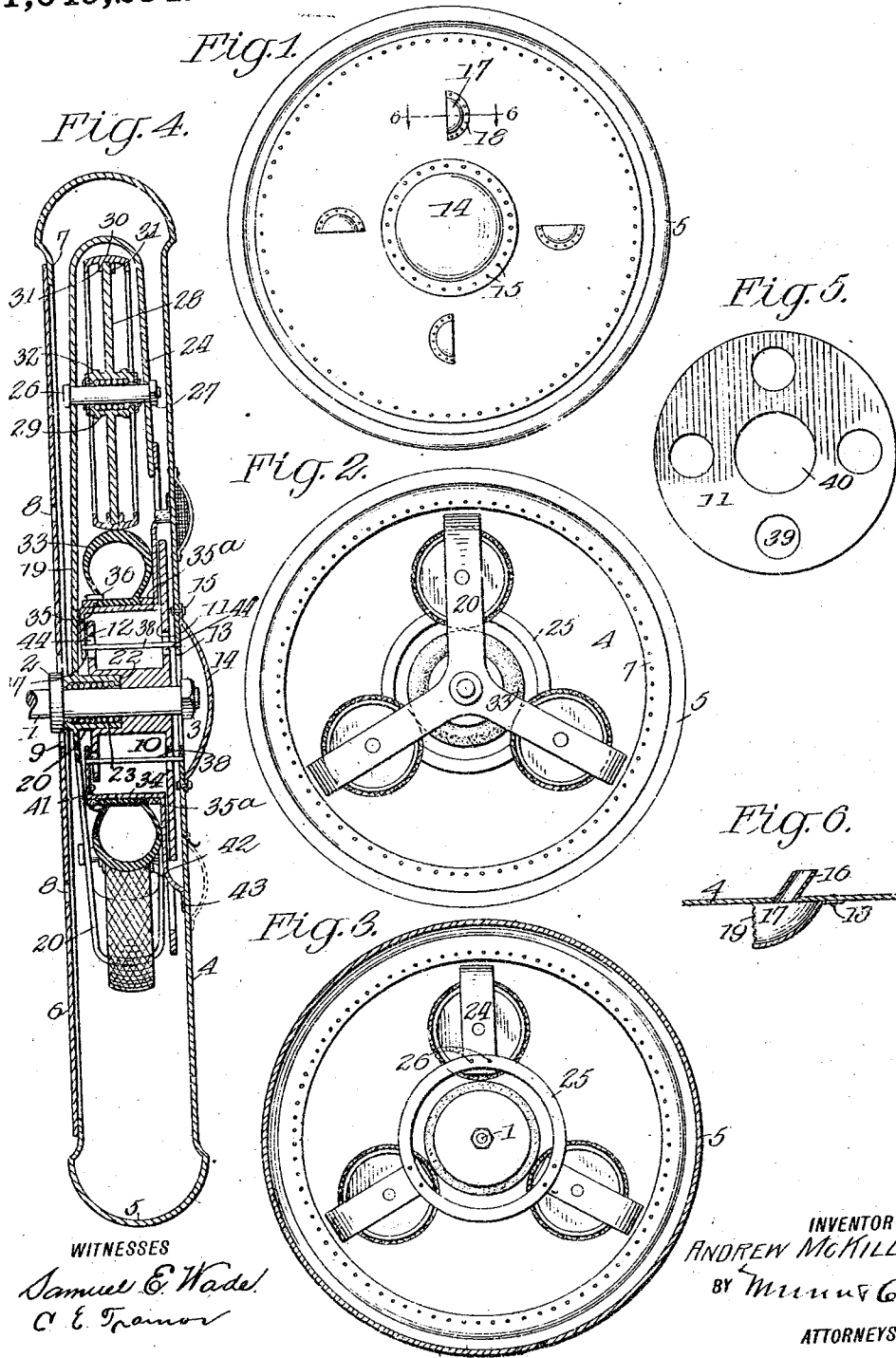


Patented Dec. 31, 1912.

1,049,254.



WITNESSES
Samuel E. Wade
C. E. Trammor

INVENTOR
ANDREW McKILLOP
BY *Munn & Co.*
ATTORNEYS

UNITED STATES PATENT OFFICE.

ANDREW McKILLOP, OF DOWNIEVILLE, CALIFORNIA.

WHEEL.

1,049,254.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed December 6, 1911. Serial No. 684,151.

To all whom it may concern:

Be it known that I, ANDREW McKILLOP, a citizen of the United States, and a resident of Downieville, in the county of Sierra, State of California, have invented a new and useful Improvement in Wheels, of which the following is a specification.

My invention is an improvement in wheels, and has for its object the provision of a simple, strong, light weight wheel wherein is provided a pneumatic cushion between the spindle and the tread protected on all sides from external injury, and imparting to the wheel a great amount of resiliency, while of small size and inexpensive.

In the drawings: Figure 1 is a side view of the wheel; Fig. 2 is a similar view, with the side plate removed; Fig. 3 is a vertical section in the plane of the wheel; Fig. 4 is a vertical section transverse to the plane of the wheel; Fig. 5 is a front view of one flange of the hub; and Fig. 6 is a section on the line 6—6 of Fig. 1.

In the present embodiment of the invention the spindle 1 of the wheel is provided with an annular rigid collar 2 at the inner side of the wheel, and a nut 3 engages the opposite end of the spindle outside of the wheel. The wheel consists of a casing composed of a disk 4 having a lateral marginal flange 5 and a cover plate 6.

The flange 5 is convex from side to side of the wheel to form a suitably shaped tread, and the edge of the flange remote from the disk is flanged inwardly, as shown at 7, and the edge of the cover plate fits against the said flange 7. The plate 6 is provided with a series of air outlets 8 and with a central opening 9 for the spindle.

A hub 10 is arranged on the spindle, the said hub having a flange 11 at the end adjacent to disk 4, and a flange 12 at the opposite end of smaller radius than flange 11. The disk 4 is provided with a central opening 13 at the spindle, and the opening 13 is covered by a cover plate 14 secured to the disk by bolts 15. The disk 4 is also provided with a series of air inlet openings 16, each of which is in the form of a spout or nozzle, directed rearwardly, that is, in the opposite direction to the movement of the wheel. A shield in the shape of a semicircular plate 17 is arranged in front of each opening, the curved edge of the plate being secured to the face of the disk by rivets 18. Each

shield is cupped outwardly, and a screen 19 of gauze extends between the free edge of each shield and the disk 4. A second hub 21 encircles the spindle adjacent to the collar, and the opposite end of the hub from the collar is received in a recess 22 in the end of hub 10. A packing 23 is arranged in hub 21, and the said hub is provided with three radial arms 20, the arms being arranged adjacent to the plate 6 and being at angles of 120° with respect to each other. Each arm 20 extends to a point adjacent to flange 5 and is then bent laterally toward disk 4, and thence inward to form an arm 24 substantially parallel with arm 20 and spaced apart therefrom. The free inner ends of arms 24 are connected by a ring 25, each arm being secured to the ring by rivets or bolts 26, and the ring is concentric with the spindle.

A stub shaft or bolt 26 is journaled parallel with the spindle in each pair 20—24 of arms, and a nut 27 engages each bolt outside of arm 24. A wheel is journaled on each bolt, and each wheel is composed of a disk 28 having a hub 29 encircling the bolt and extending on each side of the disk. A rim 30 is arranged on each disk, each rim having on its inner face and at its transverse center a pair of spaced ribs 31 between which the edge of the disk is received. The rim extends beyond both faces of the disk and is slightly convex from side to side, and a packing 32 is arranged in the hub between the same and the bolt. Each of the wheels, composed of disk 28, hub 29 and rim 30, engages at its inner side the outer surface of a pneumatic cushion 33 of annular form seated on a rim 34 between ribs 35 and 35^a, one at each side of the rim.

The ribs 35 and 35^a are as before stated on the rim 34, and flanges 41 and 42 are integral with the said rim, the said flanges being at opposite edges of the rim, and extending radially with respect to the rim in opposite direction. The flange 41 extends inwardly toward the spindle 1, while the flange 42 extends outwardly toward the tread 5, and the free edge of the said flange is offset laterally and secured to the inner face of the disk 4, as indicated at 43. The flange 41 and the disk 4 are connected by bolts 38, and the flanges 11 and 12 of the hub 10 extend between the said flange 41 and the disk 4, and each of the said flanges 11 and 12 is provided with openings or ra-

dial slots 44 at each of the bolts, for permitting the movement of the bolts radially with respect to the hub. The spindle 1, the hub 10 and the arms 20, may thus move radially toward the pneumatic tire within limits prescribed by the diameter of the opening or slots 44.

Valves 36 are provided for inflating the cushion, and one of the ribs 35 is provided with a radial flange 37 fitting outside of flange 12, and bolts 38 are passed through flange 37, flange 12 and flange 11 parallel with the spindle. The flange 11 is provided with openings 39 and with a central opening 40 for hub 10 (Fig. 5).

In operation, the flange 5 is the tread of the wheel, and when any portion of the said tread is in engagement with the ground the spindle is supported by the wheels 28—29—30 with the pneumatic cushion between the said wheels and the hub of the spindle. The three wheels prevent dislocation of the pneumatic tire or cushion, and the spindle is always perfectly cushioned by the tire. The wheel has thus all the advantages of the pneumatic cushion without any of the disadvantages. The tire is perfectly protected from any kind of injury. The wheel is easily and quickly assembled and may be of any desired weight and size.

The interior of the wheel is provided with a constant circulation of fresh air entering through the openings 16 and passing out through openings 8. The arrangement of the shield 17 insures a circulation, since they are arranged with the open side of the shield forward, and the air is scooped up by the shields and passed through the openings 16.

In use, when the tread 5 of the wheel engages the ground, the spindle and the wheels supported on the arms 20 may move with respect to the pneumatic tire supported by the disk 4, this movement being permitted by the slots 44. The tire is fixed with respect to the disk 4, by means of the ring 42 before mentioned, the said ring holding the tire rigidly in place with respect to the disk. Three points of suspension are provided, namely, the wheels on the arms 20 and whatever the position of the wheel the pneumatic tire will always be supported by the said wheels. The resiliency of the pneumatic tire is thus obtained without any danger of puncture, since the said tire is entirely protected by the casing.

I claim:

1. A wheel comprising a hollow metallic casing having one side open, a cover plate for the side, said casing having a central transverse opening, a spindle in the opening, a cover for the opening at the outer face of the wheel, a hub on the spindle provided at each end with a radial flange and at its inner end with a longitudinal recess, a hub on the spindle in the recess, arms ex-

tending radially from the last named hub, each arm being bent back upon itself in spaced relation at its outer end, a ring concentric with the wheel connecting the inwardly bent ends, a bolt connecting each arm with the return portion thereof, a disk having a hub journaled on each bolt, a rim on the disk extending beyond each face thereof, an annular pneumatic cushion engaging the inner sides of the wheel, and a rim connected to the flanges of the first named hub for limited eccentric movement with respect to the hub, said rim having a seat for the cushion.

2. A wheel comprising a hollow metallic casing having one side open, a cover plate for the side, said casing having a central transverse opening, a spindle in the opening, a cover for the opening at the outer face of the wheel, a hub on the spindle provided at each end with a radial flange and at its inner end with a longitudinal recess, a hub on the spindle in the recess, arms extending radially from the last named hub, each arm being bent back upon itself in spaced relation at its outer end, a ring concentric with the wheel connecting the inwardly bent ends, a wheel journaled between each arm and the return portion on an axis parallel to the spindle, an annular pneumatic cushion engaging the inner sides of the wheels, a rim connected to the flanges of the first named hub for limited eccentric movement with respect to the hub, said rim having a seat for the cushion.

3. A wheel comprising a hollow metallic casing having one side open, a cover plate for the side, said casing having a central transverse opening, a spindle in the opening, a cover for the opening at the outer face of the wheel, a hub on the spindle provided at each end with a radial flange and at its inner end with a longitudinal recess, a hub on the spindle in the recess, arms extending radially from the last named hub, each arm being bent back upon itself in spaced relation at its outer end, a ring concentric with the wheel connecting the inwardly bent ends, a wheel journaled between each arm and the return portion on an axis parallel to the spindle, an annular pneumatic cushion engaging the inner sides of the wheels, a rim connected to the flanges of the first named hub for limited eccentric movement with respect to the hub, said rim having a seat for the cushion.

4. A wheel comprising a hollow metallic casing having one side open, a cover plate for the side, said casing having a central transverse opening, a spindle in the opening, a cover for the opening at the outer face of the wheel, a hub on the spindle provided at each end with a radial flange and at its inner end with a longitudinal recess, a hub on the spindle in the recess, arms extending

radially from the last named hub, each arm being bent back upon itself in spaced relation at its outer end, a ring concentric with the wheel connecting the inwardly bent ends, a wheel journaled between each arm and its return portion on an axis parallel to the spindle, a rim connected to the flanges of the first named hub for limited eccentric movement with respect to the hub, and an annular cushion seated on the rim and engaged by the wheels.

5. A wheel comprising a casing having a central transverse opening, a spindle in the opening, a hub on the spindle, a rim connected to the hub for limited eccentric movement with respect to the hub, an annular pneumatic cushion seated on the rim, a second hub on the spindle provided with spaced radial arms, each arm having a return portion at its outer end spaced apart from the arm, a ring concentric with the wheel connecting the said portions, a wheel journaled between each arm and its return portion on an axis parallel to the spindle, each wheel engaging the cushion.

6. A wheel comprising a casing having a central transverse opening, a spindle in the opening, a hub on the spindle, a rim connected to the hub for limited eccentric movement with respect to the hub, an annular pneumatic cushion seated on the rim, a second hub on the spindle provided with spaced radial arms, a wheel journaled on each arm on an axis parallel to the spindle and engaging the cushion.

7. A wheel comprising a casing having a central transverse opening, a spindle in the opening, a plurality of hubs on the spindle, a rim connected to one of the hubs for limited eccentric movement with respect to the hub, an annular pneumatic cushion on the rim, the other hub having spaced radial arms, and a wheel journaled on each arm on an axis parallel to the spindle and engaging the cushion.

ANDREW McKILLOP.

Witnesses:

THOMAS E. EDWARDS,
LEEROY JEFFREY.