L. G. HANDY.

WHEEL.

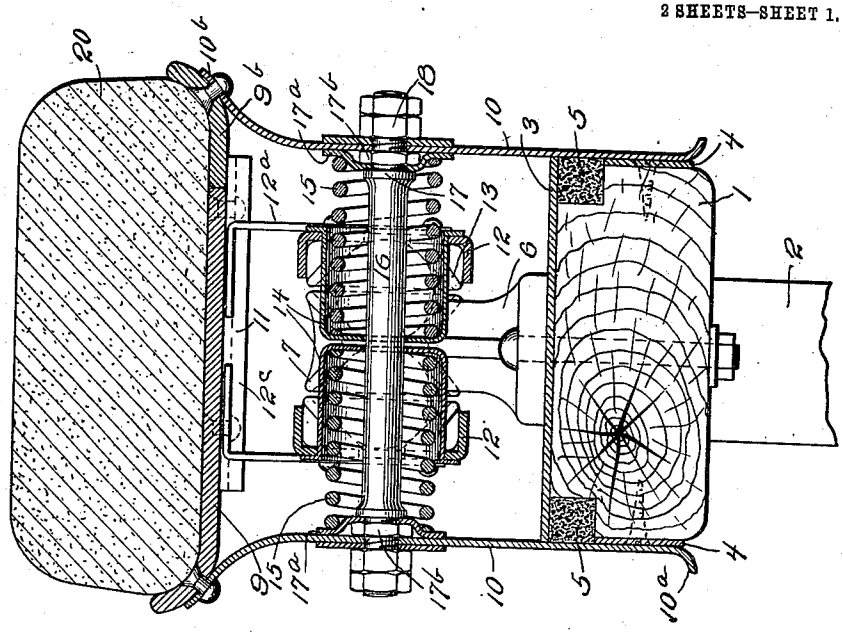
APPLICATION FILED JUNE 4, 1910.

1,013,997.

Patented Jan. 9, 1912.

2 SHEETS—SHEET 1.

Fig. 2.



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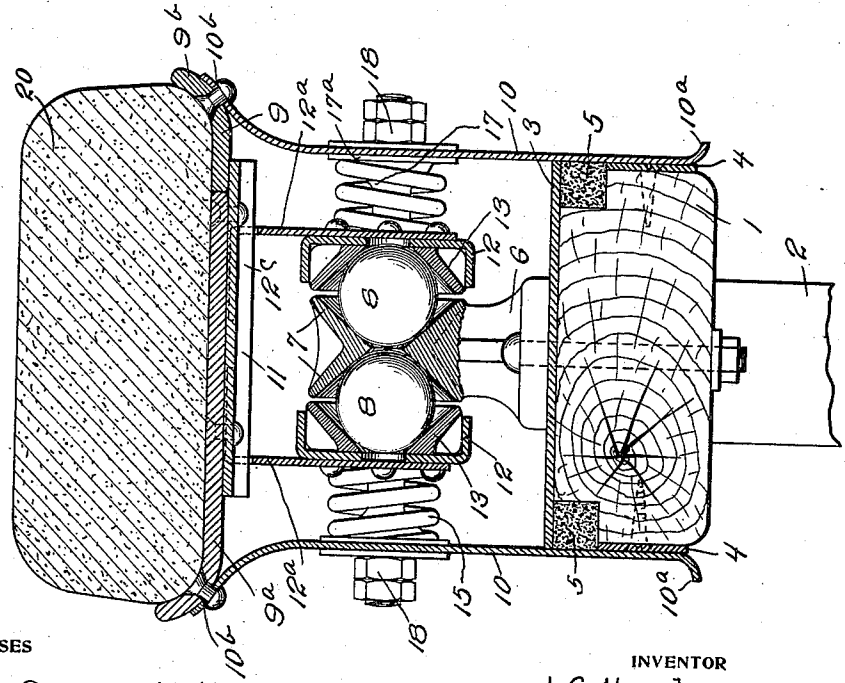

WITNESSES

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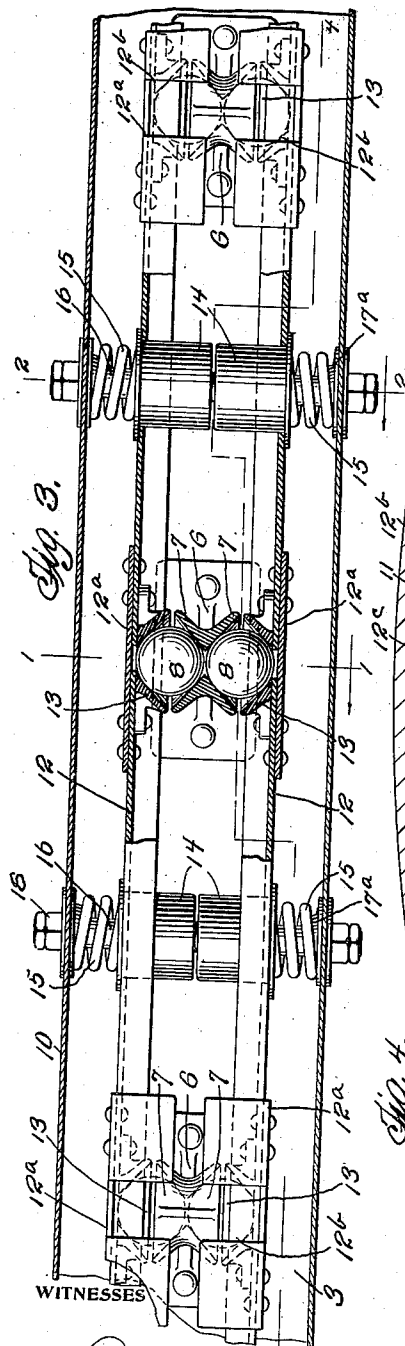

Fig. 3.

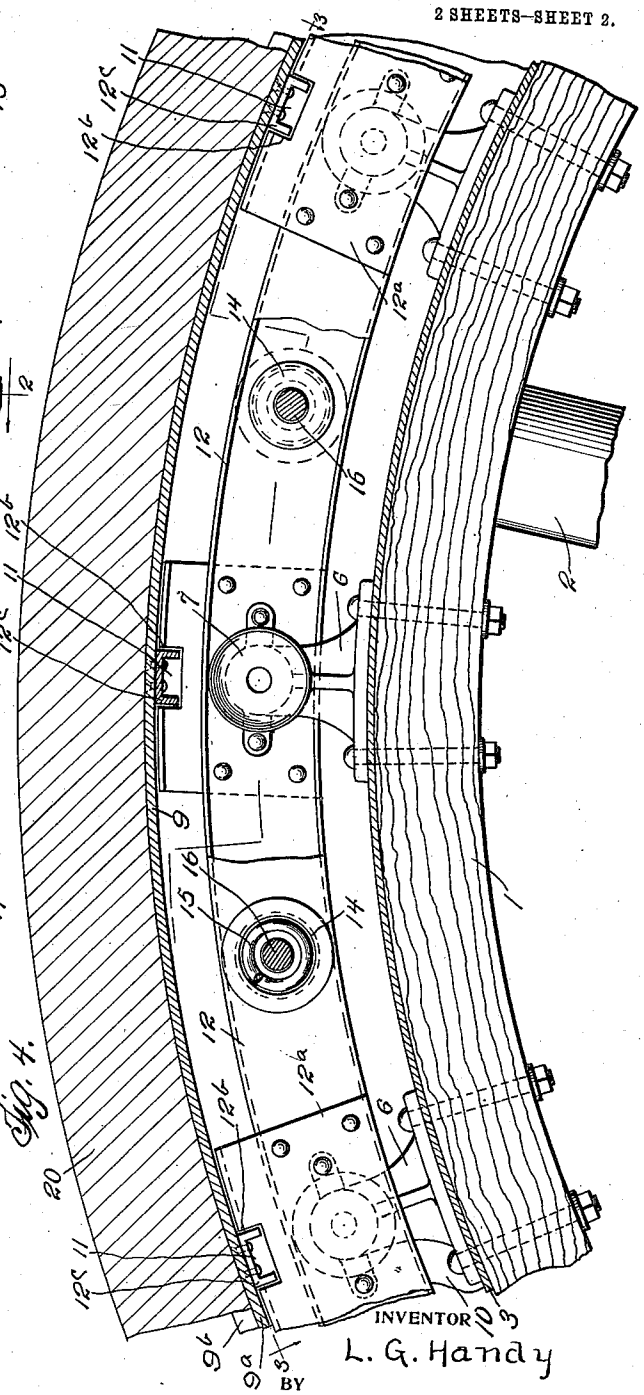

Fig. 4.

WITNESSES

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WHEEL.

1,013,997. Specification of Letters Patent. Patented Jan. 9, 1912.

Application filed June 4, 1910. Serial No. 565,066.

To all whom it may concern:

Be it known that I, LEVIN GESSFORD HANDY, residing at Rutherford, New Jersey, and being a citizen of the United States, have invented certain new and useful Improvements in Wheels, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and to use the same, reference being had to the accompanying drawings, which illustrate the preferred form of the invention, though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof will occur to persons skilled in the art.

In said drawings: Figure 1 is a transverse sectional view of a fragment of a wheel embodying the features of the invention, the section being taken on the plane indicated by line 1—1 of Fig. 3. Fig. 2 is a section taken on the plane indicated by line 2—2 of Fig. 3. Fig. 3 is a section taken on the plane indicated by line 3—3 of Fig. 4. Fig. 4 is a section taken on the plane indicated by line 4—4 of Fig. 3.

Referring to the drawings by numerals; 1 indicates the wood felly, 2 the spokes, and 3 the fixed rim of any ordinary wheel body. Suitable wear plates or rings 4 are secured to the opposite side faces of the felly. Fitted in circumferential grooves around the outer corners of the felly and beneath rim 3 is a pair of packing rings 5. Fixed to the outer face of the rim 3 and suitably spaced apart at points approximately midway in the width thereof, are a series of radially projecting standards 6. Formed at each of the standards is a pair of oppositely disposed cups 7. Slidingly engaging the opposite wear plates 4 and secured to the inner face of the detachable rim 9 is a pair of annular guide plates, or rings 10. The inner edge of each of the plates 10 is turned outwardly, as at 10^a, for the purpose of stiffening same. The outer edge of each plate 10 is turned outward and riveted or otherwise secured to the under face of the detachable rim as at 10^b. The inner circumference of the detachable rim is somewhat greater than the outer circumference of the felly, and the space between contains the resilient and frictional means of engagement therebetween.

Occupying positions upon opposite sides of the standards 6, within the space between the detachable rim and the felly, and movable in suitable guides, as at 11, is a pair of inflexible circumferentially disposed channel rings 12. The guides 11 consist of a series of plates 12^a which are riveted or otherwise secured to the flat faces of the rings 12 and extend beyond the outer flange thereof. The free ends are bent so as to lie flat against the under surface of the rim 9. Each of the plates has a portion cut from its outer end so as to form a slot, as at 12^b, for the reception of transverse guide members 12^c, which are secured to the under surface of the rim 9 as illustrated and preferably assume the form of channels.

Secured to the opposing faces of each of the rings and at points to coöperate with the cups 7 are a series of cups 13 similar to the cups 7 and forming pairs therewith. Between the cups 7 and 13 of each pair is disposed a ball 8. The balls are designed to lie normally at the center of the cups so that any sliding movement of the cups relative to each other will cause the balls to travel out the inclined walls of the cups and force the rings 12—12 apart.

At points intermediate of each of the standards 6, each of the rings 12 is provided with a spring supporting pocket 14. The pockets are fitted into suitable apertures in the rings, and between the hollow of each of the pockets and the inner wall of the adjoining side plates 10 is a compression spring 15. The pockets are arranged in pairs so that the two pockets of each pair are directly opposite across the face of the felly. A bolt 16 extends centrally through each pair of springs and through apertures in the bottoms of the pockets. The opposite ends of each of the bolts are shouldered, as at 17, engaging washers 17^a retained by nuts 17^b which in turn engage the opposite side plates 10, the end portions of the respective bolt extending beyond the shoulders 17 through the side plates. Suitable nuts as 18 engage the projecting ends of the bolts and serve to bind the parts firmly together.

To provide access to the working parts of the device, the rim 9 is formed of two sec-

tions 9^a and 9^b. The section 9^a carries one of the plates 10 and the section 9^b carries the other plate 10. The transverse guide members 12^c are arranged to project beyond the inner edge of the member 9^a and beneath the adjoining edge of the member 9^b so as to form shoulders upon which the section 9^b rests in such manner as to prevent any movement of one of the sections relative to the other when the wheel is assembled.

In operation, the weight of a vehicle, upon which the wheel may be applied, will cause the felly with the standards and the cups 7 to move toward, or away from, the rim 9. Since the rings 12 always maintain a position concentric with the rim 9, the action of the balls 8 upon the relatively inclined faces of the cups 7 and 13 will be such as to cause the rings 12 to move away from each other and against the tension of the springs 15. It will be noted that each and every spring will be simultaneously and equally affected by any movement of the rim relative to the felly, so that each of the springs will bear its exact proportion of the entire load. When the wheel body is moved relative to the demountable rim, the cups 7 are moved relative to the cups 13, and each of the balls will be caused to move away from the centers of its pair of cups and to stand with only one point in contact with each of said cups. During any subsequent movement of the cups relative to each other, the balls will simply be caused to rotate within the cups and to ride nearer to or farther from the centers of the cups according to the severity of the shocks to which the wheel is subjected. By this construction the required resiliency between the tire and the felly is admirably obtained and properly frictionally damped. Incidentally the element of friction and attendant wear is reduced to a minimum.

A suitable muffling tire 20 is mounted on rim 9, and serves to absorb the lighter shocks.

What I claim is:

1. In a wheel, a wheel body, a rim therefor, a circumferentially disposed ring between the rim and wheel body, means of frictional engagement between the ring and wheel body, means of resilient engagement between the ring and rim adapted to allow lateral movement of the ring, a plate rigidly fixed to and extending from the ring, and guiding means carried by the rim and engaging the plate for directing movement of the ring.

2. In a wheel, a wheel body, a rim therefor, a circumferentially disposed ring between the two first mentioned elements, means of frictional engagement between the ring and one of the first two mentioned elements, means of resilient engagement between the ring and the other of the first two mentioned elements, a guide plate rigidly fixed to and extending from the ring, and guiding means carried by one of the first two mentioned elements and slidingly engaging said guide plates.

3. In a wheel, a wheel body, a rim therefor, a circumferentially disposed ring between the first two mentioned elements, means of frictional engagement between the ring and one of the first two mentioned elements, means of resilient engagement between the ring and the other of the first two mentioned elements, guiding means extending from the ring toward one of the first two mentioned elements, and a channel guiding member fixed to one of the first two mentioned elements and having a sliding engagement with said guiding means.

4. In a wheel, a wheel body, a rim therefor, shiftable means of engagement between the rim and wheel body, said rim comprising detachable circumferential sections, means for securing the sections together, and a guiding member for the shiftable means of engagement, said guiding member being fixed to one section of the rim and lapping the other.

5. In a wheel, a wheel body, a rim therefor, transversely disposed guide members fixed to the rim on the inner surface thereof, circumferentially disposed rings between the wheel body and rim, means of frictional engagement between the wheel body and rings, means of resilient engagement between the rings and rim, and slotted plates fixed to the rings and disposed with the guiding members extending in the slots of the plates.

6. In a wheel, a wheel body, a rim therefor, circumferentially disposed rings between the rim and wheel body, means of frictional engagement between the wheel body and rings, means of resilient engagement between the rings and rim, transversely disposed guiding members fixed to the rim, and plates fixed to the rings and outstanding therefrom, and bent at their outer portions into flattened sections, engaging the flat inner face of the rim, each of the said flattened sections being slotted for receiving the respective guiding member.

7. In a wheel, a wheel body, a rim therefor, a circumferentially disposed ring between the rim and wheel body, means of frictional engagement between the ring and wheel body, means of resilient engagement between the ring and rim, a transversely disposed guiding member fixed to the rim, and a guiding plate fixed to the ring and outstanding therefrom into sliding engagement with the guiding member.

8. In a wheel, a wheel body, a rim therefor, a circumferentially disposed ring be-

tween the wheel body and rim, means of frictional engagement between the wheel body and ring, means of resilient engagement between the ring and rim, transversely disposed guiding members fixed to the inner face of the rim, and guiding plates fixed to the ring and outstanding therefrom, and each formed with its outer portion bent into a flat section engaging the flat inner surface of the rim and slotted for receiving the respective guiding member.

9. A device of the character described including a wheel body, a rim therefor, a circumferentially disposed ring between said rim and the wheel body, said rim comprising two sections, a side plate carried by each section, through bolts passing through said side plates, sustaining washers mounted upon said through bolts, spring members interposed between said washers and said ring, a guide plate mounted upon one section of said rim, means carried by said ring adapted to coöperate with said guide plate, and means for securing said ring to said wheel body.

10. A device of the character described including a wheel body, a rim therefor, a circumferentially disposed ring between said wheel body and said rim, resilient springs, means for sustaining and maintaining said springs in definite relation to said ring, said rim being composed of two sections, a rigid guide plate attached to one of said sections, guide members attached to said ring and adapted to coöperate with said guide plate, and connectors between said ring and said wheel body.

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

LEVIN GESSFORD HANDY.

Witnesses:
EDGAR M. KITCHIN,
FRANK V. COOPER.