W. S. WILLS.

SPRING WHEEL.

APPLICATION FILED JUNE 18, 1915. RENEWED AUG. 3, 1917.

1,259,697.

Patented Mar. 19, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

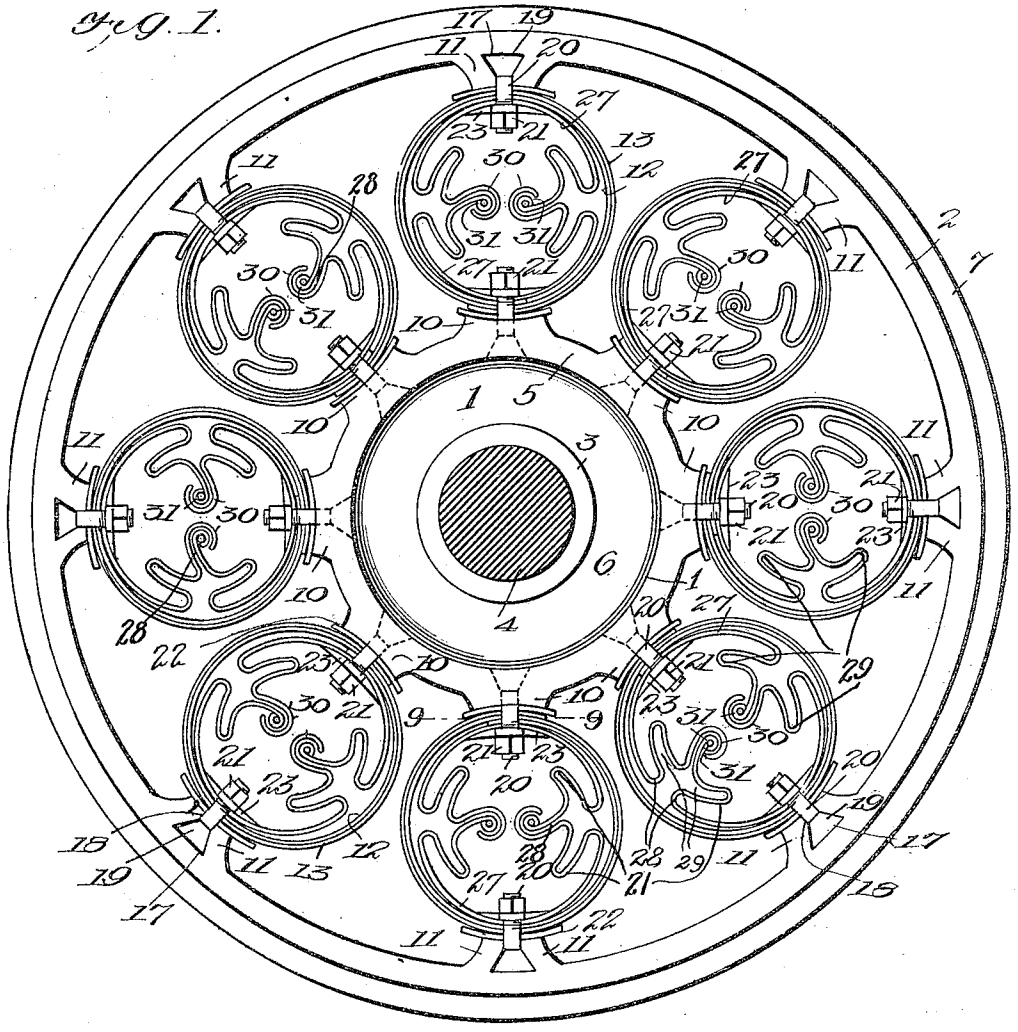


Fig. 7.

Fig. 6.

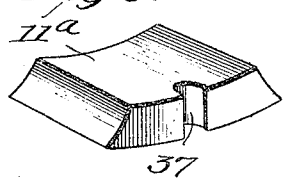


Fig. 8.

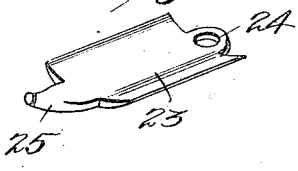
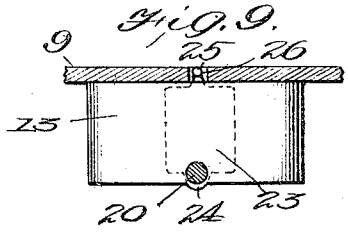


Fig. 9.



WITNESSES:

H. C. Barry

C. E. Trainor

INVENTOR

William S. Wills

BY Munn & Co.

ATTORNEYS

SACKETT & WILHELMS CORP. N.Y.

W. S. WILLS.

SPRING WHEEL.

APPLICATION FILED JUNE 18, 1915. RENEWED AUG. 3, 1917.

1,259,697.

Patented Mar. 19, 1918.

2 SHEETS—SHEET 2.

Fig. 2.

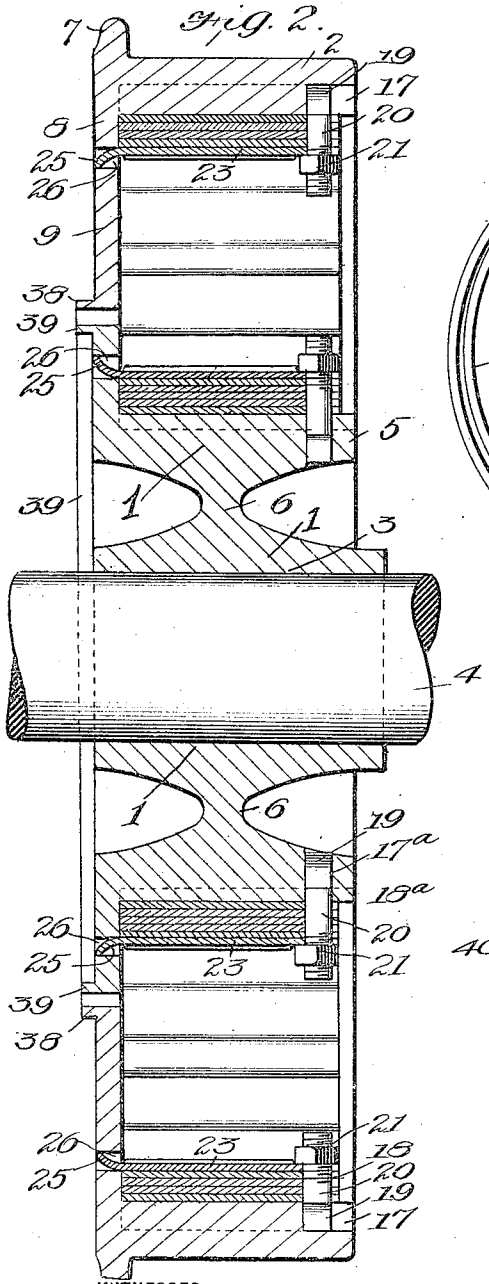


Fig. 3.

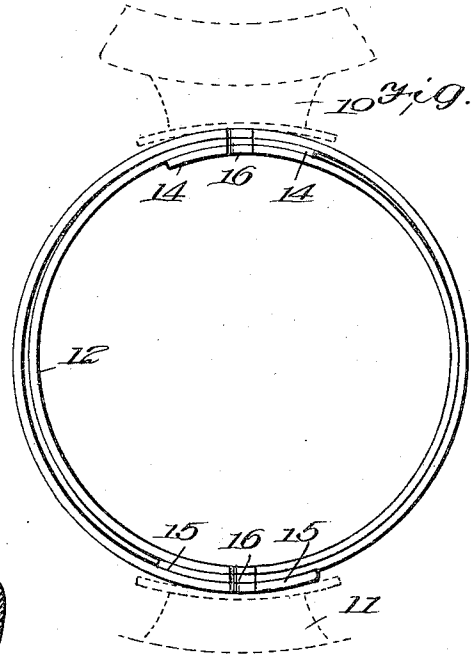


Fig. 4.

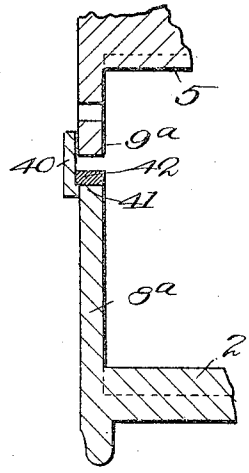
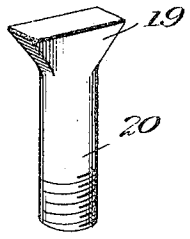


Fig. 5.



WITNESSES:

F. C. Barry

C. E. Trainor

INVENTOR

William S. Wills

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

WILLIAM S. WILLS, OF COVINGTON, VIRGINIA.

SPRING-WHEEL.

1,259,697. Specification of Letters Patent. Patented Mar. 19, 1918.

Application filed June 18, 1915, Serial No. 34,848. Renewed August 3, 1917. Serial No. 184,359.

To all whom it may concern:

Be it known that I, WILLIAM S. WILLS, a citizen of the United States, and a resident of Covington, in the county of Alleghany and State of Virginia, have made certain new and useful Improvements in Spring-Wheels, of which the following is a specification.

My invention is an improvement in spring wheels, and consists in certain novel constructions, and combinations of parts hereinafter described and claimed.

The object of the invention is to provide a wheel of the class described, especially adapted for railroad, automobile and heavy traffic work which will possess a maximum of resiliency, without weakening the structure, and wherein there will be no danger of injury from outside sources.

Referring to the drawings forming a part hereof,

Figure 1 is a side view of the wheel,

Fig. 2 is a transverse section,

Fig. 3 is a side view of a portion of a modified form of single cushioning device,

Fig. 4 is a partial section of a modified form of web,

Fig. 5 is a perspective view of the bolt holding the cushioning devices in place,

Fig. 6 is a similar view of a modified construction of rim seat,

Fig. 7 is a similar view of a modified form of hub seat,

Fig. 8 is a similar view of the washer, and

Fig. 9 is a section on the line 9—9 of Fig. 1.

The embodiment of the invention shown in the drawings comprises a hub 1, and a rim 2, which are connected by a plurality of cushioning devices to be presently described in detail. The hub consists of a central portion 3 for receiving the axle 4, and an outer portion 5 which is connected to the inner portion by a web 6.

The axle may be forced into the hub in the usual manner, and the rim is provided with the usual flange 7, when used for railroad purposes and also with an inwardly extending annular web 8 on the inner side. The outer portion 5 of the hub is also provided on its inner side with an outwardly extending annular web 9, the free edge of which is spaced apart slightly from the free edge of the web 8.

The peripheral surface of the hub, and the inner surface of the rim are provided at spaced intervals with seats 10 and 11 respectively, each seat 10 having a seat 11 in radial alinement therewith, and the before mentioned cushioning devices are arranged, one between each pair of seats.

The said devices are all alike, each comprising a plurality of split rings 12 and 13 having their ends overlapping, and the ring 12 is arranged within the ring 13, and with its overlapping ends 14 at the opposite side from the overlapping ends 15 of the said ring.

The overlapping ends 15 of the outer ring 13 are arranged on the seat 11, and the ends 14 of the inner ring are arranged on the seat 10, and each of the said ends and the body of the other ring is provided in its one side edge with a recess 16. Each of the seats 11 is provided with a substantially triangular recess 17 in its outer face arranged with its base outward, and with a radial recess 18 leading from the face of the seat to the recess 16.

Each seat 10 is provided with a similarly shaped recess 17^a extending from the inner face of the portion 5 of the hub, and with a radial opening 18^a extending from the recess to the outer face of the hub and the said recesses and openings are adapted to register with the recesses 16 of the rings.

Bolts are passed through the registering openings and recesses for securing the cushioning devices in place, each bolt consisting of a substantially triangular head 19 for engaging the triangular recess, and a threaded stem 20 passing through the other recesses, and each bolt is secured in place by a nut 21. The respective seats each have a concave face fitting the periphery of the ring, and a curved washer 22 is arranged between each seat and the cushioning device connected therewith.

A washer 23 is provided for assisting the bolt 20 and the nut 21 to hold the rings in place, and said washer is curved transversely and is shaped to fit the rings, and being provided at one end with a perforated ear 24 for engagement by the bolt stem 20, and at the other with a pin 25, bent slightly inwardly and rounded as shown in Fig. 8. Each of said pins engages an opening 26 in the web 9 of the hub, or in the web 8 of the rim as the case may be.

A spring consisting of two similar sections is arranged within each set of rings, each spring consisting of a strip bent into substantially a half circle 27, the ends of

the strip being then bent inwardly as at 28 with an open loop 29 interposed, and the extremities of each section are slidably connected by bending one extremity of one strip into a hook 30 and the other into a head 31 resting in the hook of the other section.

The sections are secured in place by the bolts 20, and the washers 23 before mentioned, each portion 27 having a recess through which the stem of the bolt passes, and the washer 23 is arranged above the portion 27. The seats 10 and 11 may be formed integral with the hub and rim respectively, or they may be separate as shown in Figs. 6 and 7. In these figures the seat 10^a for the hub is concave on both faces as shown and one edge is recessed as at 34 for receiving the bolt. The other seat 11^a is concave on one face and convex on the other and is provided with the recess 37 in its edge.

The adjacent edges of the webs 8 and 9, of the rim and hub respectively are laterally flanged as shown at 38 and 39 in Fig. 2, and are spaced apart a sufficient distance to prevent their meeting when the cushioning devices are compressed. If desired the web 8 may be provided with an offset flange 40 moving along the face of the flange 9, and with a shoulder 41 provided with a cushion 42 of rubber or other suitable material opposite the edge of the flange 9.

The improved wheel is assembled by placing the cushioning devices in place, introducing the bolts from the side, tightening the nuts, and any of the said devices may be easily removed and replaced when broken or damaged. Access is obtained to the cushions from the outer face of the wheel, and the hub bolts are inserted through the space between the portions 3 and 5 of the hub.

The operation of the improved wheel will be clear from the description and drawing. The plates 23 retain the cushioning devices in place, each plate being locked at one end by the bolt, and at the other by the engagement of the pin 25 with the opening 26 and the plates are easily removed or replaced.

I claim:

1. A spring wheel comprising a hub and a rim each having a radial web, a plurality of seats arranged at spaced intervals on the inner face of the rim, a plurality of seats arranged at spaced intervals on the outer face of the hub, each seat of the rim being in radial alinement with the corresponding seat of the hub, and a cushioning device between each pair of seats, each of said devices comprising a plurality of split rings, each ring having its ends overlapping, each of said seats having at one side an undercut recess, a bolt having a head fitting the recess, and a washer having at one end a perforated ear for engagement by the bolt and at the other end a pin, the webs of the hub and rim having openings to receive the pins to lock the rings on the seat.

2. A spring wheel comprising a hub and a rim, a plurality of cushioning devices between the hub and the rim, each of said devices comprising resilient rings, the rim and the hub having seats for engagement by the rings, each of said seats having at one side an undercut recess, a bolt having a head fitting the recess, a washer having at one end a perforated ear for receiving the bolt and at the other end a pin, the hub and the rim being flanged and the flanges having openings to receive the pins to retain the rings in place.

3. A spring wheel comprising a hub and a rim, a plurality of cushioning devices between the hub and the rim, each of said devices comprising resilient rings, the rim and the hub having seats for engagement by the rings, a washer arranged transversely of the rings adjacent to each seat, said washer having at one end a perforated ear and at the other a pin, the hub and the rim being flanged and the flanges having openings for receiving the pins, and bolts detachably connected to the seats and engaging the perforated ears.

4. A spring wheel comprising a plurality of cushioning devices between the hub and the rim, each of said devices comprising resilient rings and an auxiliary inner spring made in two pieces of similar shape and dimensions, each piece being made of a strip of metal bent into substantially a half circle with the ends bent inwardly toward the center, one end formed into a knob and the other into an open loop and so that when brought together the knob of one section will slide into the loop of the mate-section forming thus one auxiliary out of the two sections, the rim and the hub having seats for engagement by the cushioning devices, a washer arranged transversely of the rings and auxiliary spring adjacent to each seat, each washer having at one end a perforated ear and at the other a pin, the hub and the rim being flanged and the flanges having openings for receiving the pins, and bolts detachably connected with the seats and engaging the perforated ears substantially as described.

WM. S. WILLS.

Witnesses:
THOS. B. MCCALEE,
R. B. STEPHENSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."