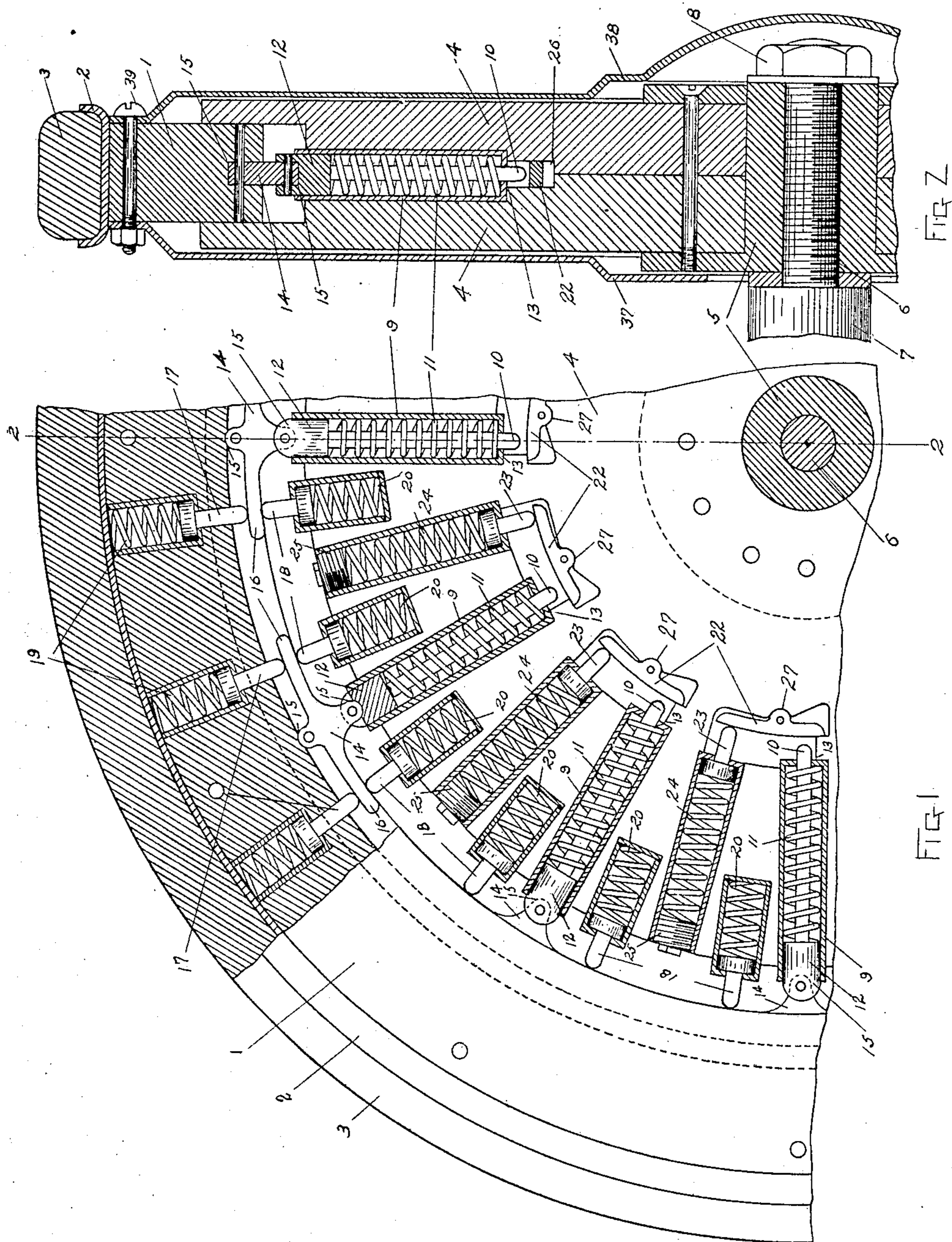


No. 878,422.

PATENTED FEB. 4, 1908.

W. J. PHELAN.
SPRING WHEEL.

APPLICATION FILED JAN. 9, 1907.



WITNESSES
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UNITED STATES PATENT OFFICE.

WILLIAM J. PHELAN, OF BENNINGTON, VERMONT.

SPRING-WHEEL.

No. 878,422.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed January 9, 1907. Serial No. 351,474.

To all whom it may concern:

Be it known that I, WILLIAM J. PHELAN, a citizen of the United States, residing at Bennington, county of Bennington, and State of Vermont, have invented certain new and useful Improvements in Spring-Wheels, of which the following is a specification.

The invention relates to such improvements and consists of the novel construction and combination of parts hereinafter described and subsequently claimed.

Reference may be had to the accompanying drawings, and the reference characters marked thereon, which form a part of this specification.

Similar characters refer to similar parts in the several figures therein.

Figure 1 of the drawings is a view in side elevation of my improved spring-wheel with one of the disks removed, the wheel being partly broken away and partly shown in vertical section. Fig. 2 is a cross section of the same taken on the broken line 2—2 in Fig. 1.

The principal object of my invention is to provide, for road vehicles, a spring-wheel capable of taking up, and absorbing to a large extent, the shocks due to engagement with road-obstructions.

Other objects of the invention will appear in connection with the following description.

Referring to the drawings wherein the invention is shown in preferred form, 1, is the felly of the wheel which may be made of wood, preferably provided with a metal rim, 2, formed to receive a solid rubber tire 3.

The felly fits loosely between a pair of hub-disks, 4, as shown in Fig. 2, one of said disks being removed in Fig. 1 for convenience of illustration.

The hub-disks are mounted upon a metal hub-sleeve, 5, which is shown interiorly screw-threaded to fit the spindle, 6, of the axle, 7, upon which it is locked by means of a lock-nut 8.

The wheel may be mounted upon the axle in any known manner.

At regularly disposed intervals, the neighboring faces of the hub-disks, 4, are recessed to receive the radially arranged cylinders, 9, within each of which is located a plunger-rod, 10, capable of longitudinal movement therewithin, and yieldingly forced outwardly by means of a coil-spring, 11, engaging at its outer end a head, 12, on the rod, 10, and at its inner end a transverse dia-

phragm, 13, in the cylinder, 9, through which the rod freely passes.

The outer end of each plunger-rod is connected with the felly by a link, 14, whereby the shock, due to movement of the felly upon engaging a road-obstacle, will be transmitted through the plunger-rods and springs to the hub, said shock being largely taken up and absorbed by said springs.

Each link, 14, is pivotally mounted at its opposite ends, respectively, upon the felly and a plunger-head, 12, but the pivotal connections are made somewhat loose, so that slight play is given to the link upon the pivot, permitting the opposite ends of the link, which are convexly rounded, to directly engage concavely rounded seats formed respectively on the felly and plunger-head, as shown at, 15, in Fig. 1.

Each of the links, 14, is preferably cross-shaped, each of the oppositely projecting arms, 16, thereof being interposed between a pair of spring-actuated plungers, 17 and 18, which are held by the respective springs, 19 and 20, in engagement with the inner and outer sides of said arm and tend to resist a rocking or rotative movement of the link upon either of its pivotal connections with the felly and piston-head respectively.

The springs, 19 and 20, are confined within suitable chambers in the hub and felly respectively.

To further relieve an excessive shock, I have provided a lever, 22, mounted within the hub, the shorter end of which lever is located in the path of the plunger-rod, 10, when an excessive degree of inward movement is imparted to said rod.

Located in the path of the long arm of said lever is a plunger, 23, yieldingly supported against the thrust of said lever-arm by a coil-spring, 24, confined within a suitable chamber in the hub and adapted to be maintained under greater or less compression by means of an adjustable screw 25. The other arm of the lever, 22, is normally maintained out of contact with the plunger-rod, 10, and is only engaged by the end of said plunger-rod when an excessive inward movement is imparted thereto, greater than can be prevented by the various other springs above described. Whenever such an excessive movement is imparted to the plunger-rod, however, it will be forced against the shorter arm of the lever, 22, the ability of which to resist the inward thrust of the plunger-rod,

10, can be regulated in accordance with the weight of the load and character of the road on which the vehicle is to be used.

5 The effectiveness of the lever, 22, can thus be varied within certain limits by means of the adjusting screw 25.

10 The proportions of the lever, 22, can also be varied to give to the spring-actuated plunger, 23, a greater or less advantage of leverage as may be desired.

15 The lever, 22, is loosely pivoted upon the hub within the lever chamber, 26, and is provided with a convexly curved offset on its inner side adapted to engage a concavely curved seat on the head, as shown at 27.

The rocker bearings formed at, 15 and 27, serve to relieve the neighboring pivotal connections from strain and wear.

20 The wheel is shown inclosed at its opposite sides by dust-caps or disks, 37 and 38, secured upon the felly by bolts 39.

What I claim as new and desire to secure by Letters Patent is

25 1. In a spring-wheel, and in combination, a relatively movable hub and felly; a reciprocatory spring-actuated plunger-rod mounted upon the hub; a head upon the outer end of said plunger-rod; and a link pivotally connected at its opposite ends to the felly and
30 a plunger-head and having its opposite ends directly engageable with said felly and plunger-head.

35 2. In a spring-wheel, and in combination, a relatively movable hub and felly, said felly having concaved seats; reciprocatory spring-actuated plunger-rods mounted upon the hub in line with the respective seats on the felly; a head on each plunger-rod provided
with a concaved seat; and a link loosely piv-

40 otated to the felly and a plunger-head respectively, and having convexed ends adapted to directly engage the concaved seats on said felly and plunger-head respectively.

45 3. In a spring-wheel, and in combination, a relatively movable hub and felly; spring-actuated plunger-rods mounted upon the hub; a link pivotally connected at one end to a plunger-rod and at the other end to the felly, and having a lateral offset; spring-actuated mechanism mounted upon the felly,
50 engageable with one side of said link-offset; and spring-actuated mechanism mounted upon the hub engageable with the opposite side of said link-offset.

55 4. In a spring-wheel, and in combination, a relatively movable hub and felly; reciprocatory spring-actuated plunger-rods mounted upon the hub; links each pivotally connected at one end to the felly and at the other end to a plunger-rod, and having op-
60 positively projecting offsets; and a pair of spring-actuated members engageable with the respective link-offsets.

65 5. In a spring-wheel, and in combination, a relatively movable hub and felly; reciprocatory spring-actuated felly-supporting plunger-rods mounted upon the hub; a lever mounted upon the hub with one arm located in the path of said plunger; and spring-actuated mechanism mounted upon
70 the hub engageable with the other arm of said lever.

In testimony whereof I have hereunto set my hand this 29th day of December, 1906.

WILLIAM J. PHELAN.

Witnesses:

EDWARD J. HALL,
M. E. DENIO.