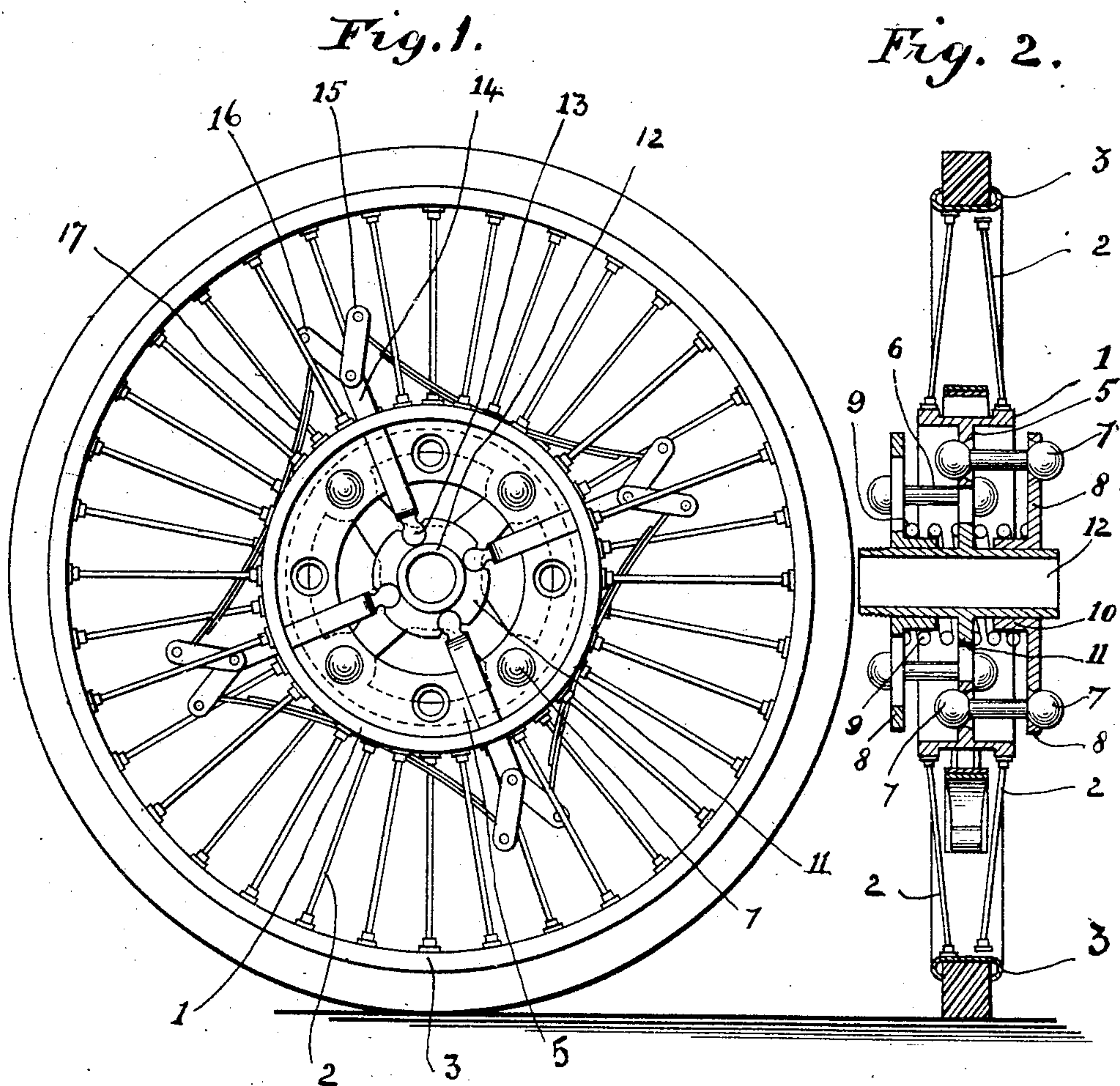


No. 779,929.

PATENTED JAN. 10, 1905.

C. R. S. J. HALLÉ.  
WHEEL FOR VEHICLES.  
APPLICATION FILED AUG. 8, 1904.

2 SHEETS—SHEET 1.



Witnesses,

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2 SHEETS—SHEET 2.

Fig. 3.

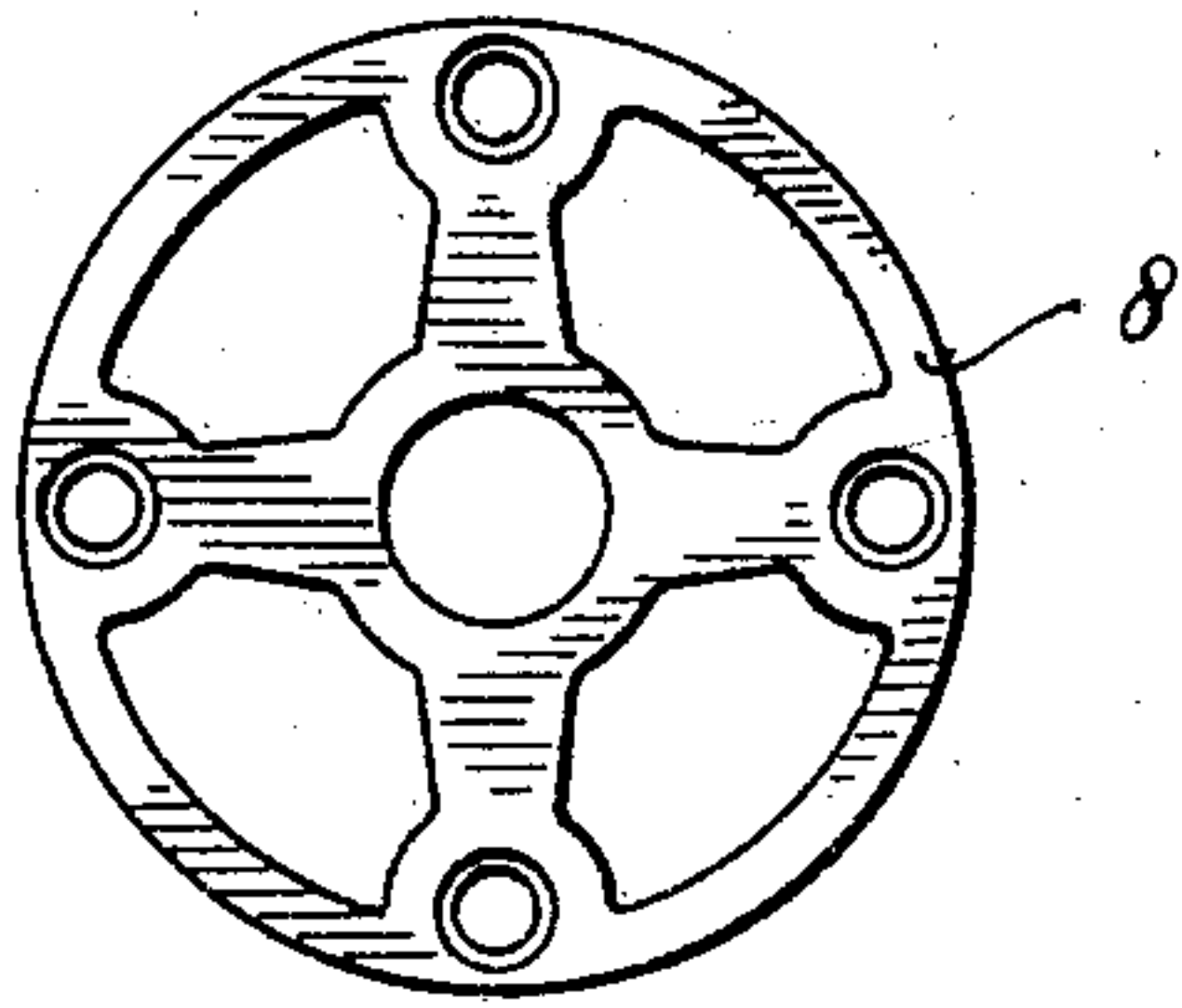


Fig. 4.

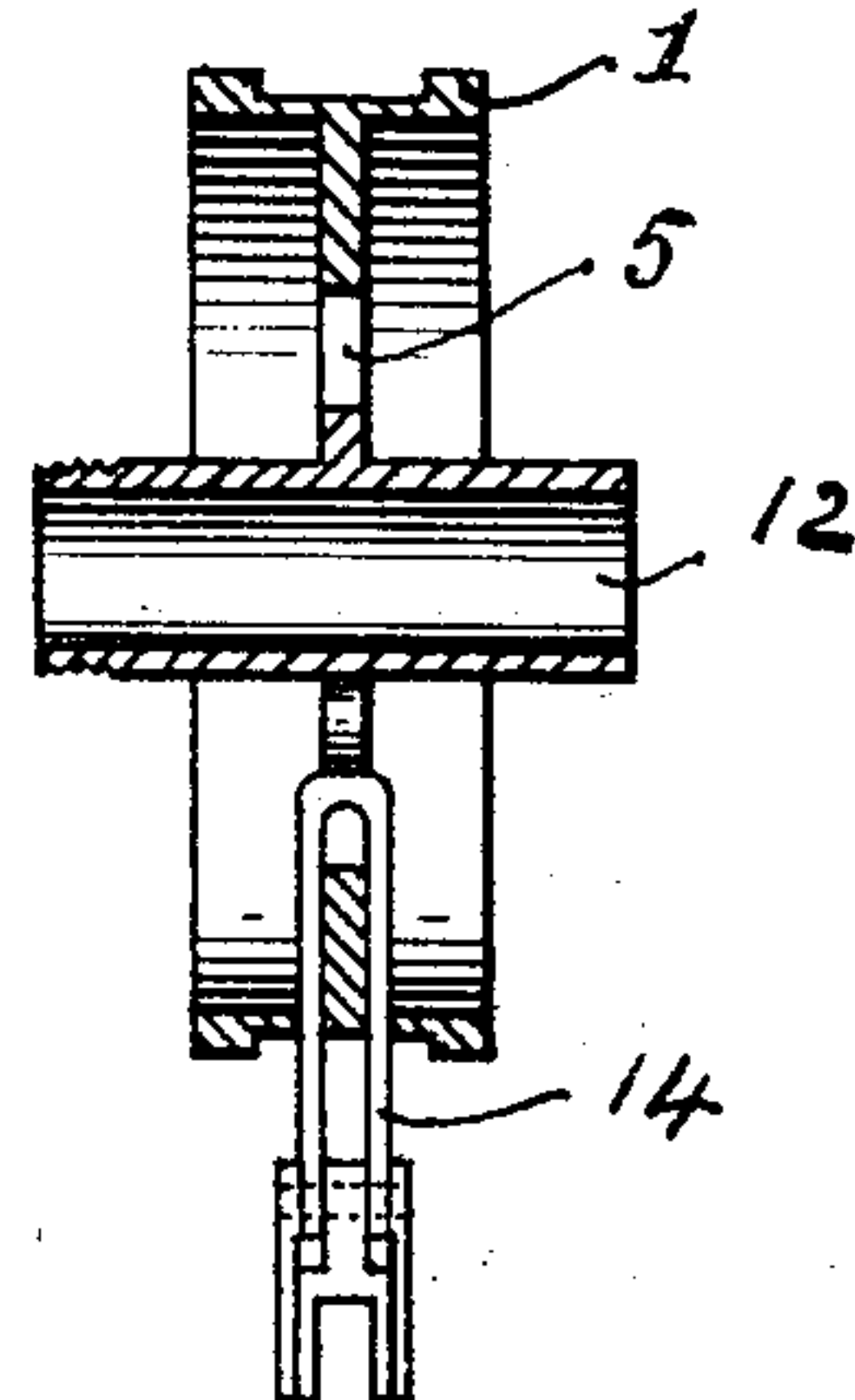


Fig. 5.

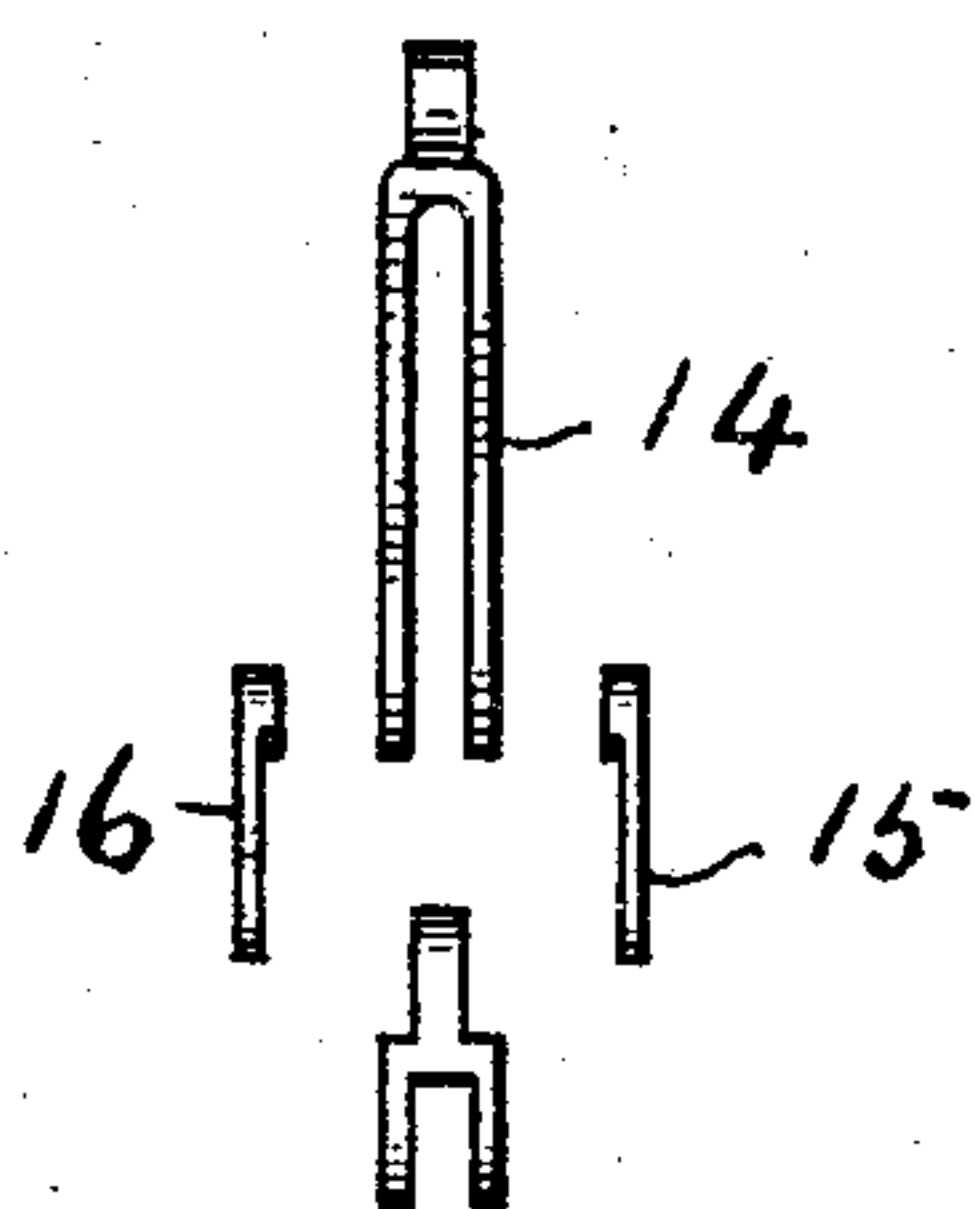


Fig. 6.

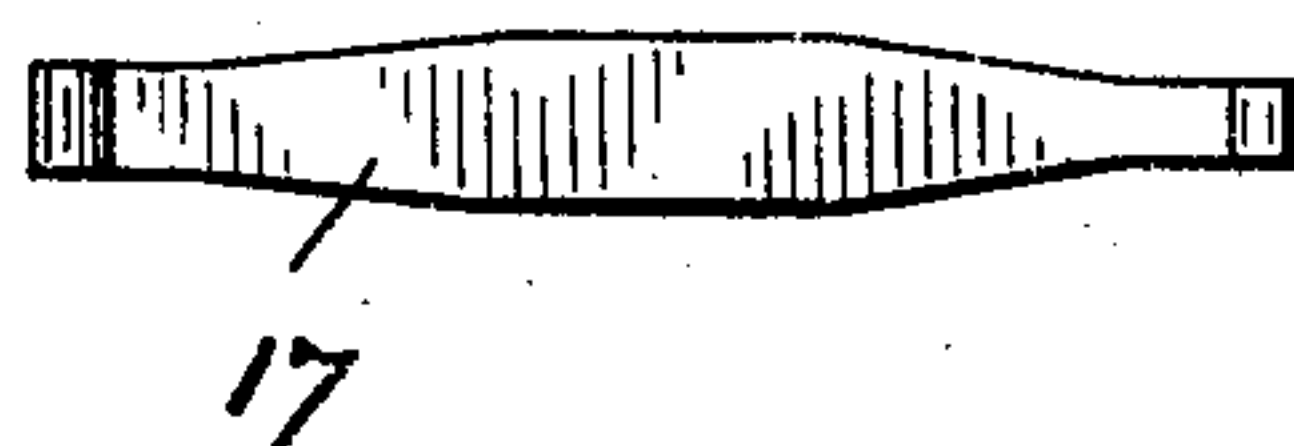


Fig. 7.



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# UNITED STATES PATENT OFFICE.

CLIFFORD ROBERT STEPHEN JOHN HALLÉ, OF LONDON, ENGLAND.

## WHEEL FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 779,929, dated January 10, 1905.

Application filed August 8, 1904. Serial No. 219,986.

*To all whom it may concern:*

Be it known that I, CLIFFORD ROBERT STEPHEN JOHN HALLÉ, a subject of the King of Great Britain, residing at 204 Cromwell road, South Kensington, London, England, have invented certain new and useful Improvements in Wheels for Vehicles, of which the following is a specification.

The object of this invention is to construct a durable wheel for all kinds of vehicles, which wheel within itself has spring against shocks and jars.

The subject-matter of this particular invention relates to a novel and improved form of arranging springs which have their resilience vertically. These springs, with the mechanism that appertains to their use, can be used either by themselves in a wheel that relies on the friction of the double bars (to be hereinafter described) against side play or wobble, or preferably in conjunction with the side disks and universal joints, as described herein, which side disks and other appliances form the subject-matter of another patent application.

My invention will be clearly understood from the following description, aided by the accompanying drawings, in which—

Figure 1 is a side elevation of a wheel with one front plate removed. Fig. 2 is a section of a complete wheel. Fig. 3 is an elevation of a side plate. Fig. 4 is a section of the two members forming the hub with one of the links connecting the axle with the springs shown in position; Fig. 5, an elevation of the links. Figs. 6 and 7 are a plan and side view of one of the springs.

I am aware of the very numerous attempts that have already been patented with the object of securing a satisfactory spring-wheel. The great difficulty lies in a satisfactory provision against side play or wobble and in self-driven vehicles in the provision of a means of propelling the wheel without the necessity of driving through the springs. The first essential of a spring-wheel is that the wheel should be able to become eccentric to the axle to a large extent, if necessary, without any diminution of the stability of the whole structure. The next is to provide suitable buffer-

springs between the periphery of the wheel and the axle, so as to protect the latter from shocks and jars.

In the accompanying drawings, Fig. 2 shows a section of a wheel, the one portion of which is, so to speak, devoted to the purpose of securing the possibility of the wheel becoming eccentric to the axle without suffering any loss of stability, whereas the other portion shows a novel and effective way of protecting the axle from road shocks by means of linked carriage-springs.

In my invention the wheel proper consists of the hub 1, from which the spokes 2 radiate in the ordinary manner to the rim 3. This hub is a ring of suitable metal with an inner flange 5. This flange 5 is provided with holes to any convenient number for the purpose of forming cups in which balls 7 may rock. On the inner tube 12, which is mounted on the axle, are placed two disks provided with tubes 10, so that they may slide on the inner tube 12, while the tubes 10 are of sufficient length to insure of the disks 8 having no side play. In these disks 8 there are holes corresponding to the holes in the flange 5 of the hub. The holes in the disk 8 and the holes in the flange 5 of the hub are connected by simple dumb-bell links—i. e., rods 6 with a ball 7 at either end. Between the tubes of the disks and the axle proper of the vehicle there is an inner tube 12, provided with a strong flange or ring 11. It is on this tube that the disks slide. The disks are kept apart by means of very powerful spiral springs 9, that abut against the flange 11 of the tube 12, encircling the tubes 10 on the disks 8 and pressing the disks forcibly outward. The hub 1 is therefore, so to speak, hung onto the disks 8 by the eight or more dumb-bell links 6. The disks 8 are so constructed that they must always remain at right angles to the axle. The dumb-bell links 6 being all parallel and of the same length and being kept constantly in the same state of tension by the very powerful spiral springs 9 constantly and in any degree of eccentricity keep the wheel proper also at right angles to the axle by keeping it always parallel to the two disks 8. As the wheel becomes eccentric to the axle



the disks are drawn nearer together by the action of the dumb-bell links 6, and after a certain stage of eccentricity is reached the spiral springs 9 act very powerfully as a means  
 5 of resilience. In the initial stages, however, the weight of the car has of course a great advantage over the stress of the spiral springs, so that when spiral springs (that practice has shown to be amply strong enough to over-  
 10 come the slightest tendency to side play) are used the wheel would normally be somewhat more eccentric to the axle than is desirable. To increase the tension of the spiral springs means placing an unnecessary strain on the  
 15 parts, and it is better to employ springs acting vertically to assist the action of the spiral springs in the first half-inch or so of eccentricity of the wheel. This is accomplished by means of double-barred links 14,  
 20 the knuckle ends of which, 13, can rock in hollows cut in the ring 11 of the tube 12. The double bars pass one on either side of the flange 5 of the hub 1, through slots in the hub, and into the space between the spokes.  
 25 Here links 15 16 are pivoted on, as shown in the drawings, the other ends of the links being attached to carriage-springs 17, which lie upon the metal ring that forms the hub of the wheel. It is thus evident that the wheel is  
 30 again hung onto the tube 12 in such a manner that it can become eccentric to the axle and that this eccentricity is resisted in all directions equally by the carriage-springs.

An especial feature of my invention is the  
 35 links 15 16, which connect the double bars 14 with the carriage-springs 17. By means of these links 15 16 a very large eccentricity of the wheel is obtainable with a very small compression of the springs. This enables the  
 40 springs to be made very strong and durable, as the constant movement they have to suffer is reduced to the minimum. It is of course evident that by making the double bars of sufficient strength and pivoting them strongly  
 45 to the tube 12 the system of disks and dumb-bell links may be dispensed with and the double bars 14 may be relied upon solely as guardians against side play. In the drawings the knuckle ends 13 of the double-barred  
 50 links are shown as kept in place by the spiral springs 9.

What I claim, and desire to secure by Letters Patent, is—

1. A spring-wheel involving a hub having  
 55 an inwardly-extending flange, a plurality of barred links supported upon an axle-box and

extending through and beyond said hub, a plurality of laminated springs connecting the outer ends of said links together, a pair of laterally-movable disks supported upon the  
 60 axle-box, a spring element interposed between said disks, and a plurality of links universally connected at one end to said flange and at the other end to said disks.

2. A spring-wheel involving the combination with an axle-box, of a hub having an inwardly-extending flange, a plurality of radially-extending rocking links having one end suitably connected with the axle-box and projecting through and beyond said hub, a plu-  
 65 rality of spring elements connecting the outer ends of said links together, a pair of laterally-movable disks supported upon the axle-box, extensible springs interposed between said disks, and a plurality of links universally  
 70 connected at one end to said flange and at the other end to said disks.

3. A spring-wheel involving the combination with an axle-box, of a hub, a rocking spring element surrounding said hub and suitably connected with the axle-box, a pair of laterally-movable disks supported upon the  
 80 axle-box, an extensible spring element interposed between said disks, and a universal connection between the disks and the hub.

4. A spring-wheel involving the combination with an axle, a tube mounted thereon and provided with a recessed flange, a hub surrounding said tube and provided with an inwardly-extending flange having a plurality of  
 90 openings, said hub further provided with a series of openings, a pair of laterally-movable disks sliding upon said tube and provided with openings corresponding to the openings in the flange of the hub, a series of links having  
 95 knuckle ends mounted in the recesses of said flange, said links extending through the openings in the hub, a plurality of springs for connecting the outer ends of the links together, dumb-bell links engaging in the openings of  
 100 the flange and the openings of the disk for connecting the hub with the disk, and a pair of springs surrounding said tube, abutting against the flange thereon and against the inner face of said disks.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CLIFFORD ROBERT STEPHEN JOHN HALLÉ.

Witnesses:

PERCY E. MATTOCKS,  
 WM. O. BROWN.