

No. 653,102.

Patented July 3, 1900.

C. A. LIEB.
MOTOR VEHICLE.

(Application filed May 8, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

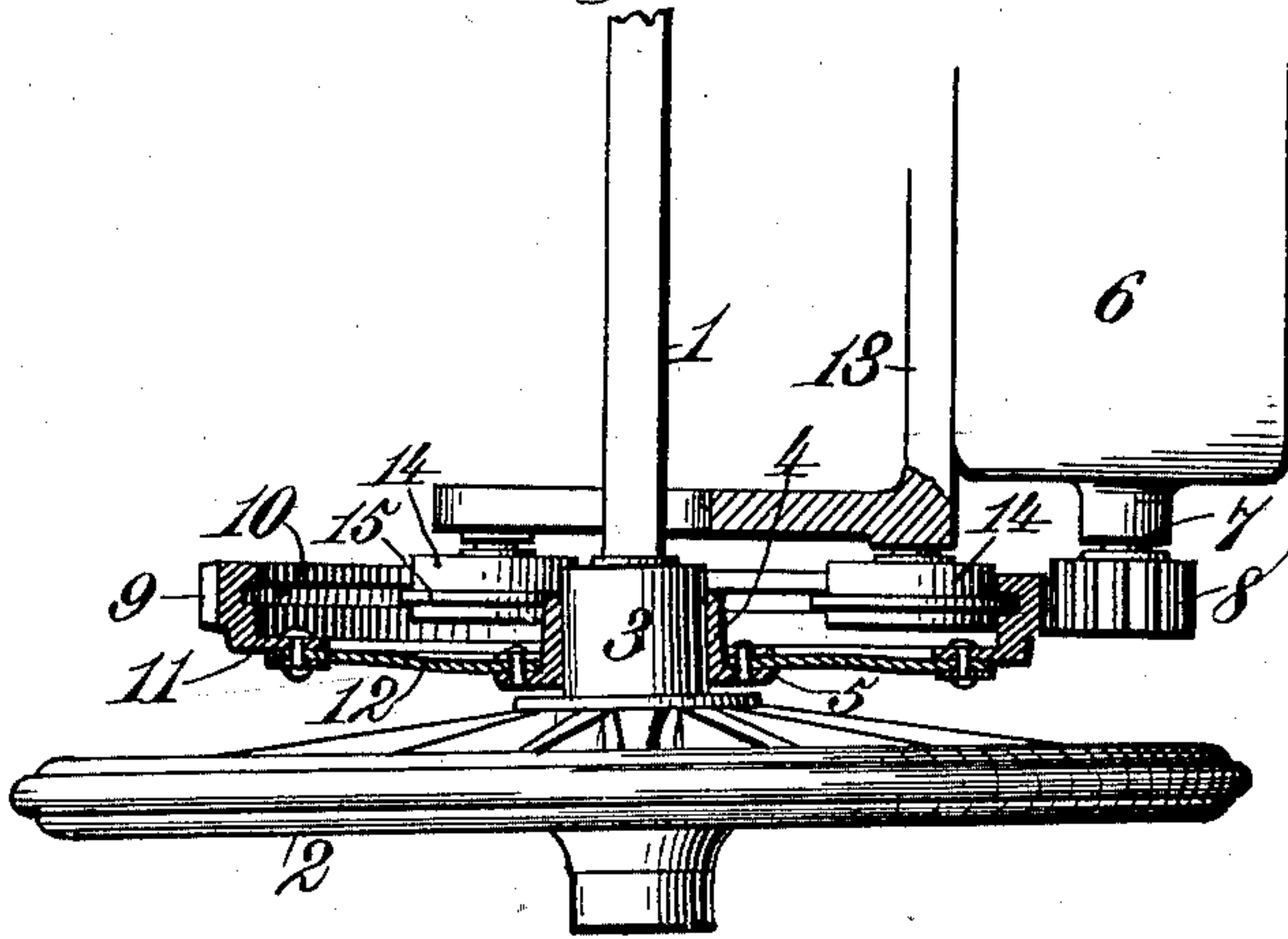


Fig. 2.

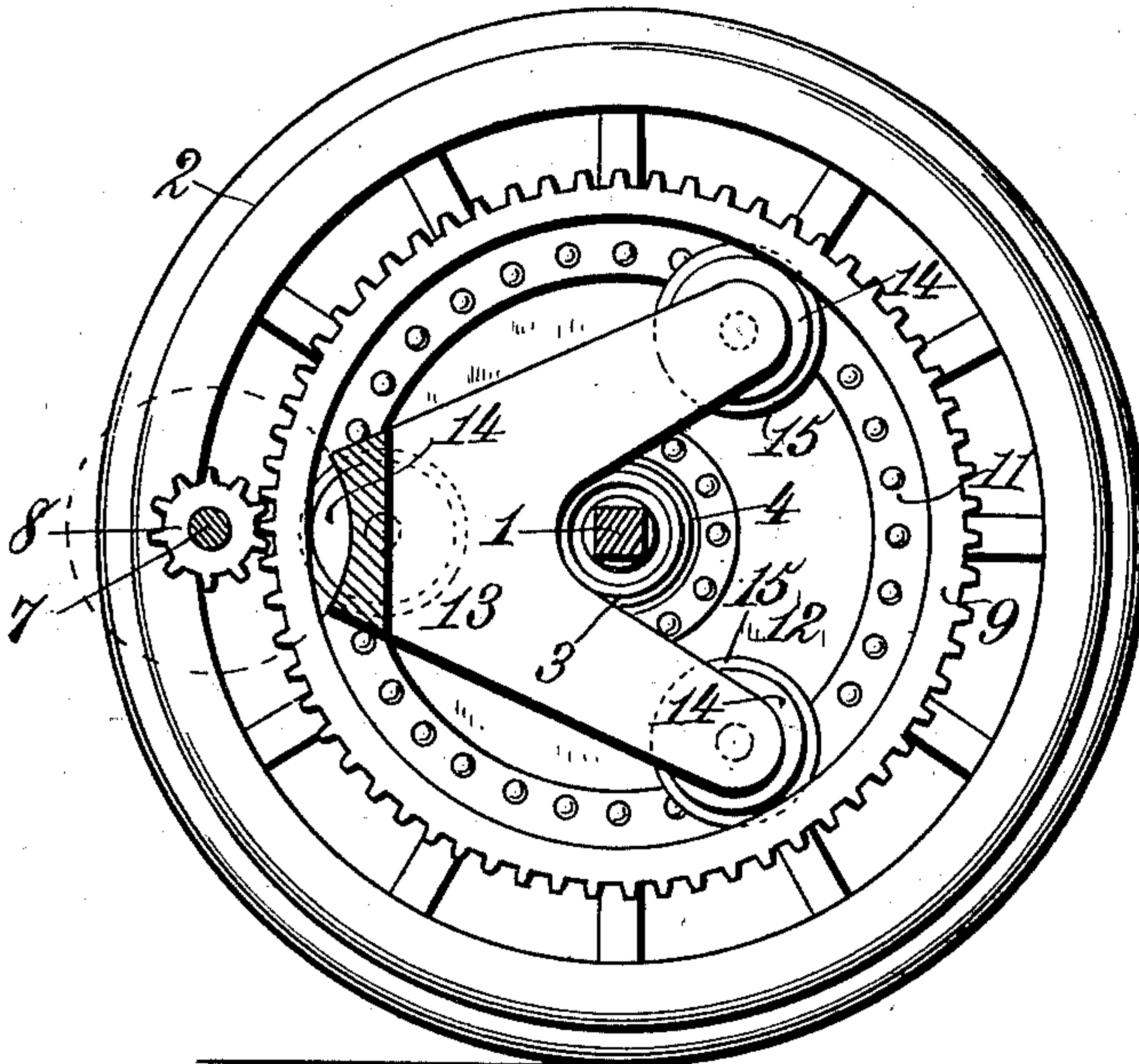
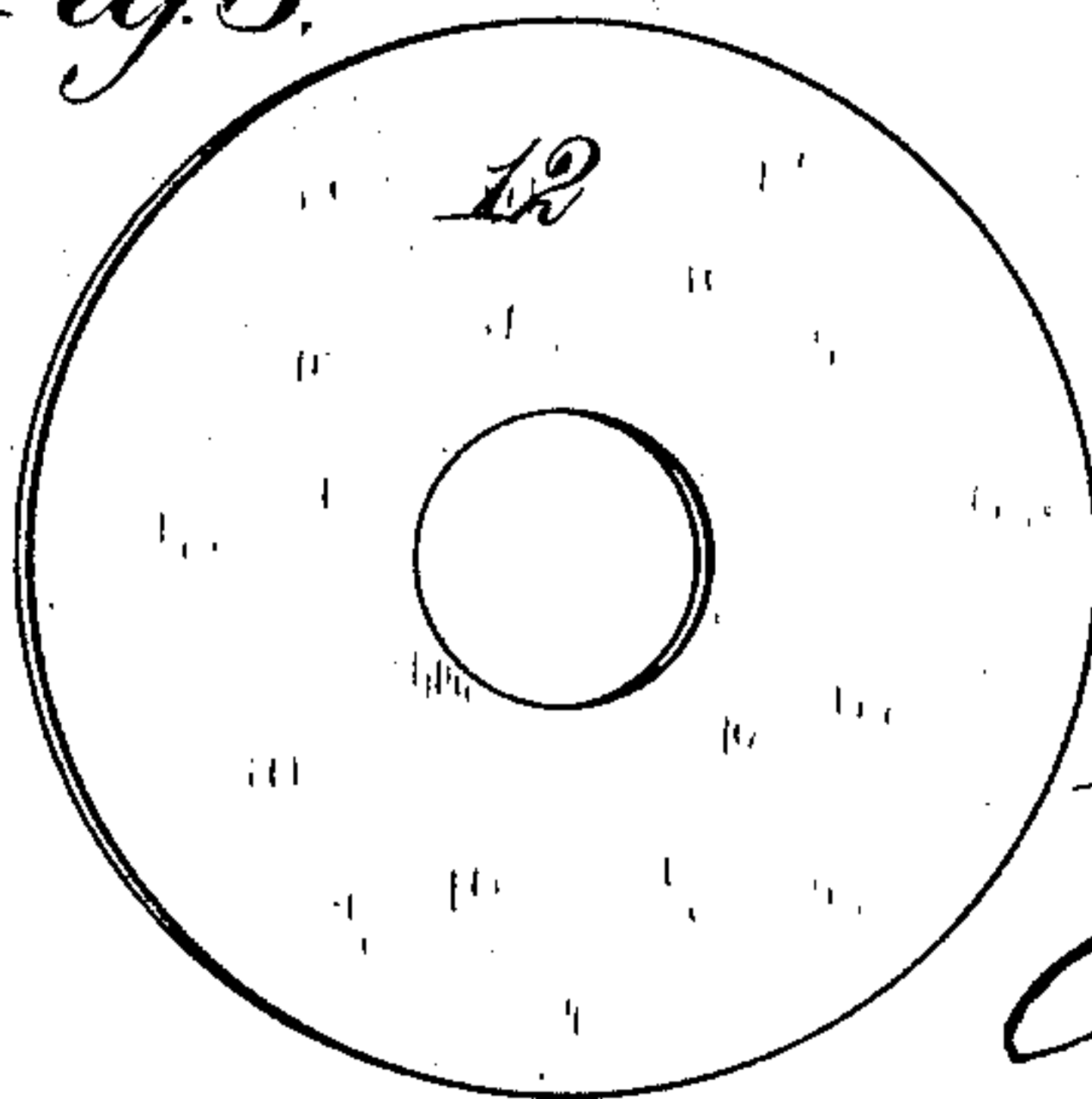


Fig. 3.



Witnesses:
Robert Everett
W. B. Keeler

Inventor:
Charles A. Lieb.
By *James L. Norris*
Att'y.

No. 653,102.

Patented July 3, 1900.

C. A. LIEB.
MOTOR VEHICLE.

(Application filed May 6, 1899.)

(No Model.)

2 Sheets—Sheet 2.

Fig. 4.

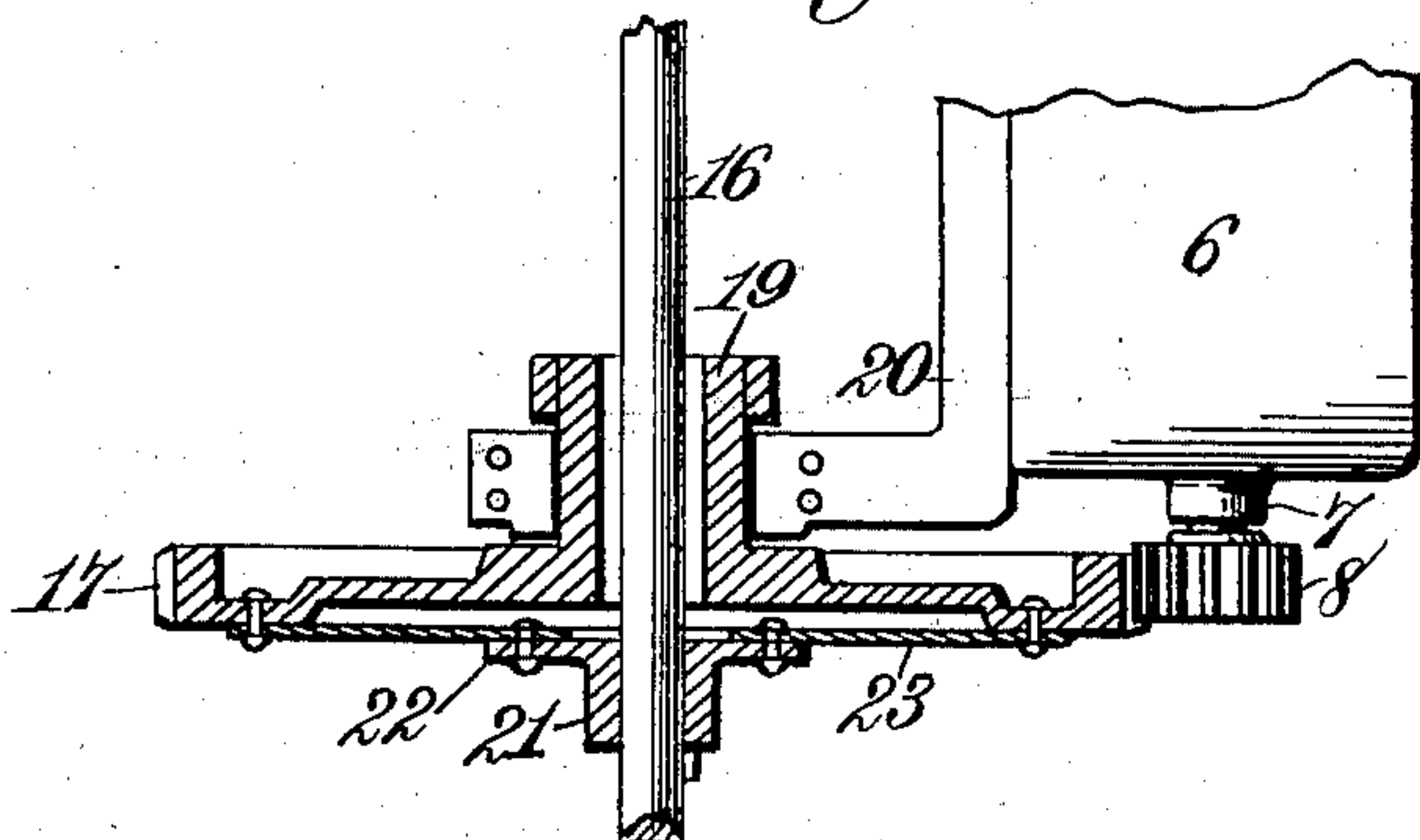


Fig. 5.

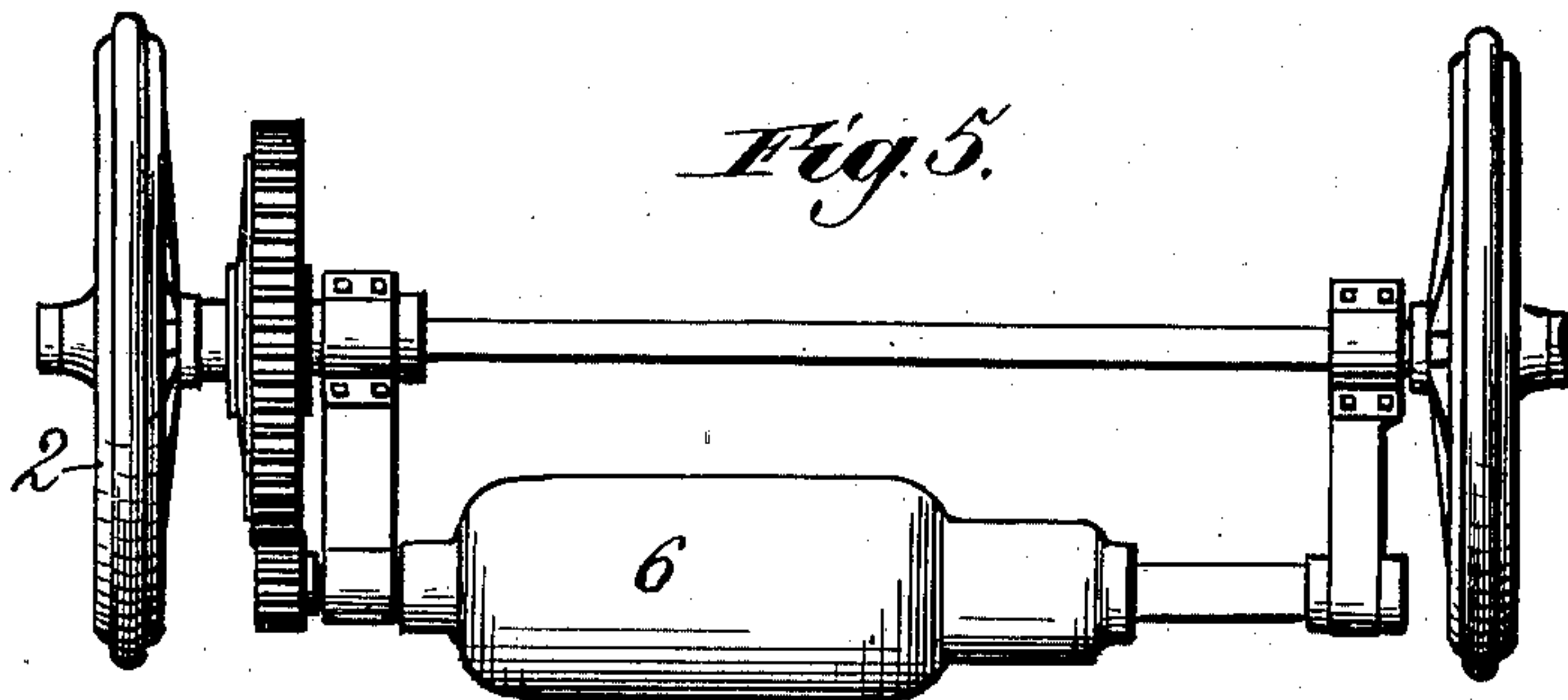


Fig. 6.

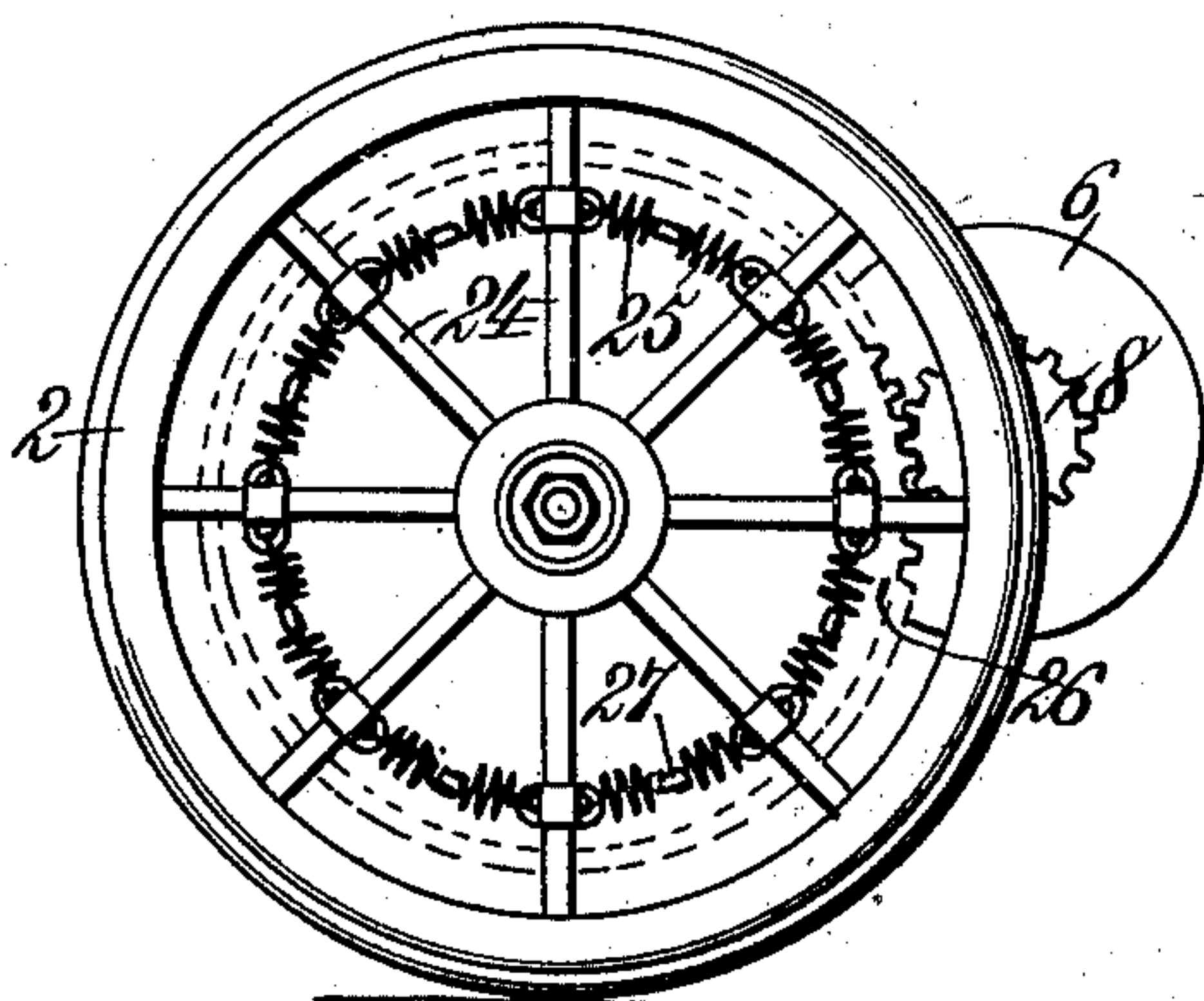
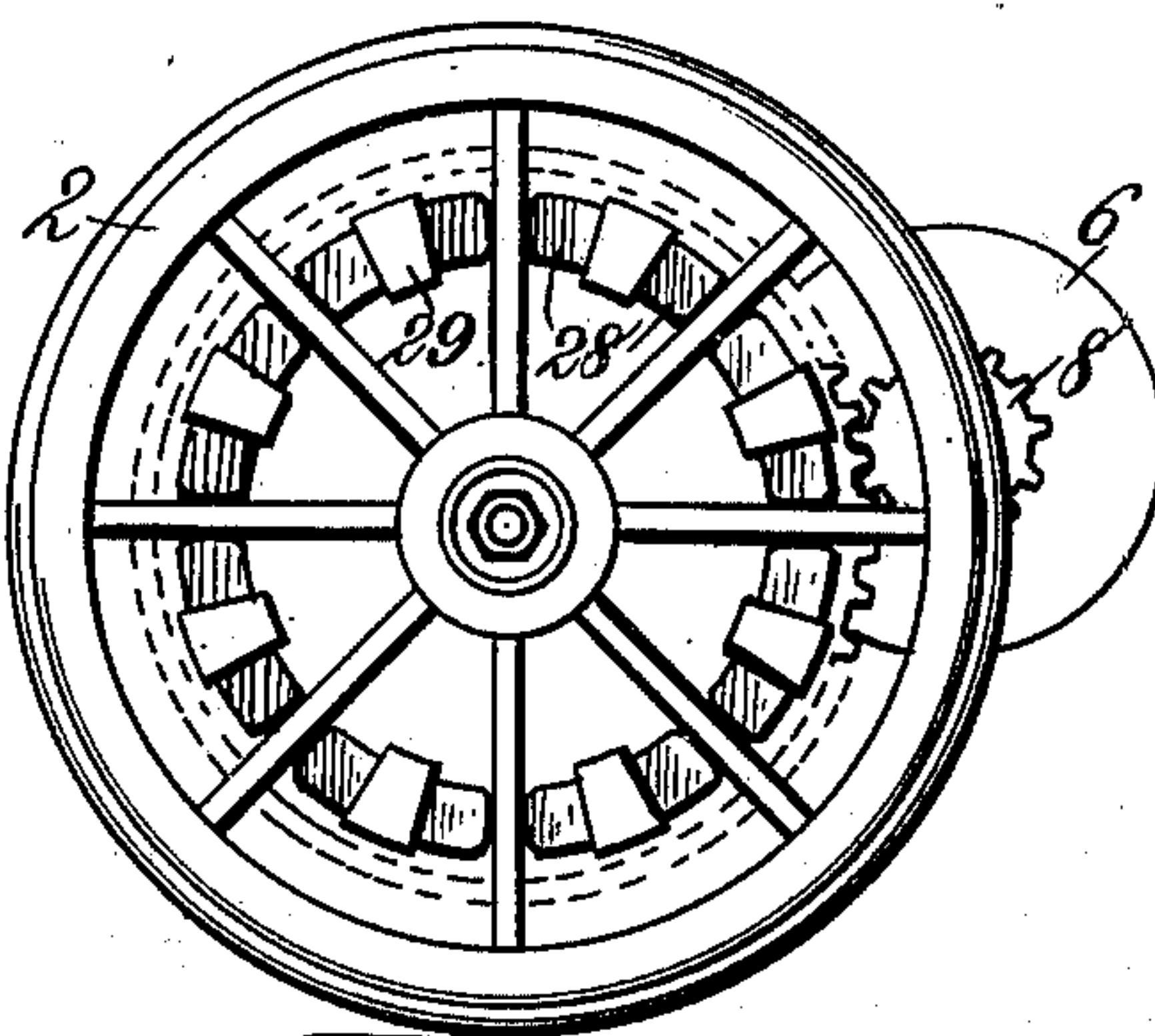


Fig. 7.



Witnesses.
Robert Gruett,
F. D. Keefe

Inventor,
Charles A. Lieb.
By *James L. Norris*
Atty.

UNITED STATES PATENT OFFICE.

CHARLES A. LIEB, OF NEW YORK, N. Y.

MOTOR-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 653,102, dated July 3, 1900.

Application filed May 6, 1899. Serial No. 715,821. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. LIEB, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Motor-Vehicles, of which the following is a specification.

In motor-vehicles and the like where the power of the motor is transmitted through gear-wheels to the shaft or axle on which the supporting-wheels of the vehicle are mounted or direct to the wheel itself when it rotates upon the axle great difficulty and objection have arisen, owing to the fact that as the axle wears or springs lateral vibration of the supporting-wheels is permitted, which either throws the gear-wheels out of mesh entirely or disposes them at an angle to each other, so that friction and binding take place.

My invention is designed to overcome the objections above noted; and it consists in providing a flexible connection between the gear-wheel and the rotary part to which power is applied.

The invention also consists in certain details of construction and combinations of parts, which will be hereinafter more fully described and claimed.

In the drawings forming part of this specification, Figure 1 is a plan view, partly in section, of one embodiment of my invention. Fig. 2 is a vertical section on the line xx , Fig. 1. Fig. 3 is a detail plan view of the flexible disk employed. Fig. 4 is a horizontal section showing a modification. Fig. 5 is a plan view of the same, and Figs. 6 and 7 are detail views representing other modifications.

Like reference-numerals indicate like parts in the different views.

In the form of my invention illustrated in Figs. 1, 2, and 3 of the drawings the axle 1 is stationary, and the supporting-wheel 2 is mounted to rotate upon the end thereof. Secured to the hub 3 of the wheel 2 is a collar or sleeve 4, having an annular outwardly-projecting flange 5 thereon. The motor 6 is of any suitable form and construction and is mounted in any suitable manner upon the body of the vehicle. The motor-shaft 7 carries a pinion 8, which meshes with a gear-wheel 9, which, as shown, is in ring form and

has on its inner surface an annular groove 10. Said gear-wheel is also provided with an inwardly-extending annular flange 11, through which and the flange 5 on the sleeve 4 said gear-wheel is connected to the supporting-wheel 2 by means of a disk 12, of leather or other flexible or yielding material. The said disk is provided with a central opening, through which the collar 4 extends and is secured to the flanges 5 and 11 by screws, rivets, or other analogous devices. Secured to the motor 6 or to a stationary part of the motor-frame is a bracket 13, carrying a plurality of guide and supporting rollers 14 14, which are provided with circumferential ribs or tongues 15, which fit within the groove 10 in the gear-wheel 9.

It will of course be understood from the preliminary statements in this specification that the object of the above construction is to maintain the gear-wheel 9 and pinion 8 in mesh with each other at all times and to permit of a rocking or lateral movement of the supporting-wheel 2 on the axle 1. As the gear-wheel 9 is supported upon and guided by the rollers 14 14, it is of course independent of the supporting-wheel 2 and is maintained at all times in the same relative position with respect to the pinion 8. The flexible disk 12, however, by means of which said gear-wheel and said supporting-wheel 2 are connected together, permits of a slight lateral movement of said supporting-wheel when the axle 1 wears.

In the form of my invention above described I have assumed that the axle 1 is fixed on the body of the vehicle and that the supporting-wheel 2 of the vehicle turns upon the end of the axle. It may be found desirable, however, to make the axle rotatable and to secure the supporting-wheel to the end thereof.

In Figs. 4 and 5 of the drawings I have illustrated a shaft or axle 16, which is to be rotated from the motor 6 from the pinion 8 on the end of the motor-shaft. In this case the gear-wheel 17, with which the pinion 8 meshes, is formed with a central hub 19, which loosely surrounds or embraces the shaft or axle 16 and is supported by a bracket 20 on the motor or other fixed part of the vehicle. Keyed

or otherwise secured to the shaft or axle 16 is a sleeve or collar 21, having an annular outwardly-projecting flange 22, to which and to the gear-wheel 17 is connected a disk 23, of leather or other flexible yielding material, similar in all respects to the disk 12, heretofore referred to. By this construction it will be seen that the gear-wheel 17 is supported independently of the rotary shaft or axle 16 and that it is maintained at all times in mesh with the pinion 8. The motion of said gear-wheel is transmitted to the shaft or axle 16 through the flexible yielding connection 23, which permits of a rocking movement of said shaft or axle in its bearings without affecting the gearing.

In the form of my invention illustrated in Fig. 6 of the drawings the adjacent spokes 24 of the supporting-wheel of the vehicle are connected by stiff coil-springs 25, and the gear-wheel 26, which meshes with the pinion on the motor-shaft, is provided with outwardly - extending lugs or projections 27, which are secured to the springs 25, so that while the motion of said gear-wheel is transmitted to said supporting-wheels a lateral or rocking movement of said supporting-wheels is permitted independent of said gear-wheel.

In Fig. 7 I have shown in lieu of the springs 25, which connect the spokes 24 of the supporting-wheel of the vehicle, blocks 28 28, of soft rubber or other yielding material, and lugs or projections 29 on the gear-wheel which meshes with the pinion 8 on the motor-shaft, the said lugs being located between each pair of blocks 28 and serving to transmit the motion of said gear-wheel to said supporting-wheel. As the blocks 28 are of yielding material, however, a rocking movement of the

supporting-wheels is permitted independent of the gear-wheel.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the axle of a vehicle and a supporting-wheel thereon, of a motor, a pinion driven thereby, a ring gear-wheel meshing with said pinion and surrounding said axle, supporting-rollers for said gear-wheel, and a flexible connection between said gear-wheel and said supporting-wheel.

2. The combination with the axle of a vehicle and a supporting-wheel thereon, of a motor, a pinion driven thereby, a ring gear-wheel meshing with said pinion, means for supporting said gear-wheel independent of the axle and the supporting-wheel, and a disk of yielding material connecting said gear and supporting wheels.

3. The combination with the axle of a vehicle and a supporting-wheel thereon, of a motor, a pinion driven thereby, a ring-gear meshing with said pinion, surrounding said axle and provided with an annular groove on its inner surface, a stationary bracket, a plurality of guide and supporting rollers carried thereby, each having a peripheral web thereon which fits within said groove, and a yielding connection between said gear-wheel and said supporting-wheel.

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

CHARLES A. LIEB.

Witnesses:

WM. M. STOCKBRIDGE,
GEO. W. REA.