L. A. HILL.

DRIVING MECHANISM.

APPLICATION FILED MAY 18, 1908.

915,858.

Patented Mar. 23, 1909.

3 SHEETS—SHEET 1.

FIG. 1.

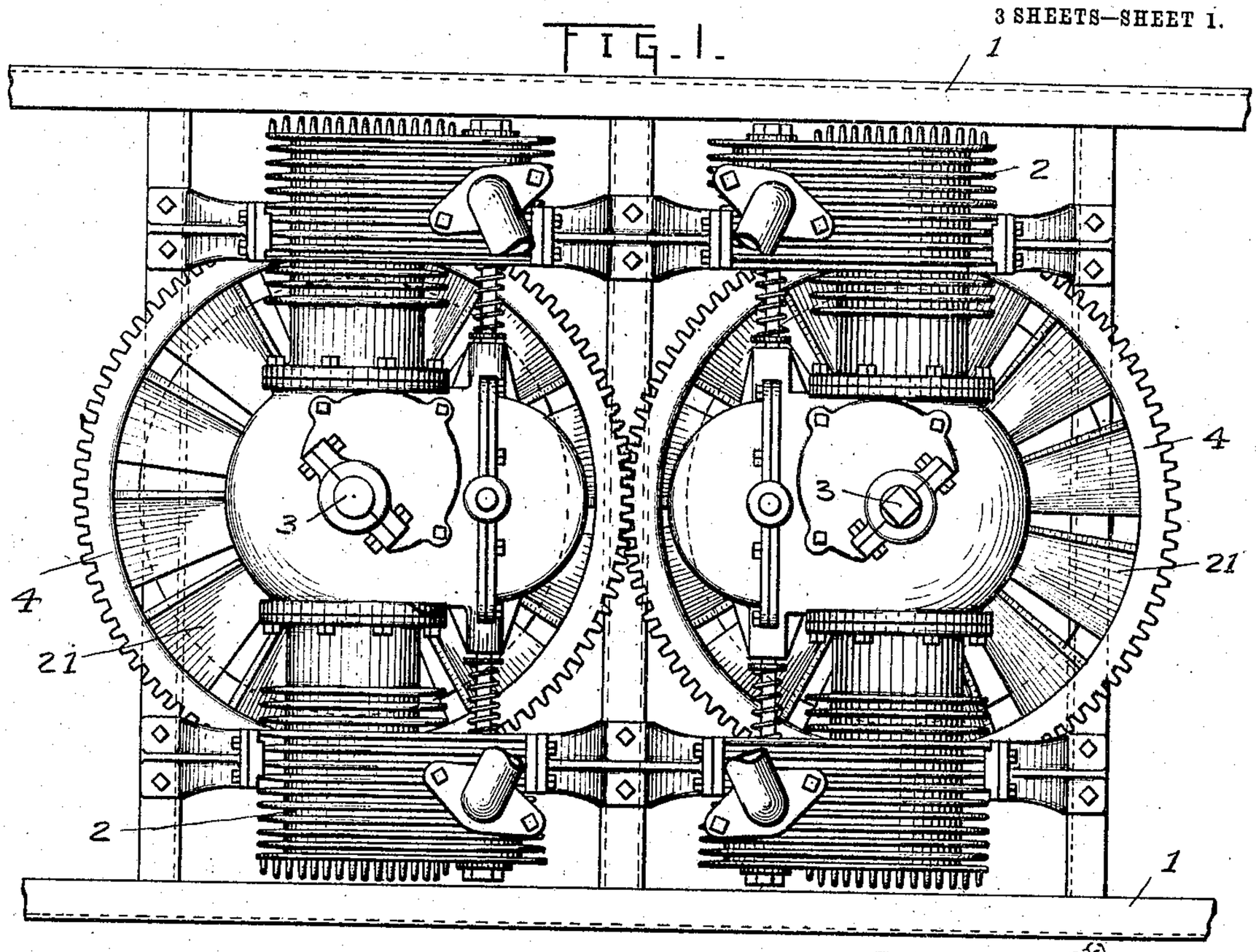
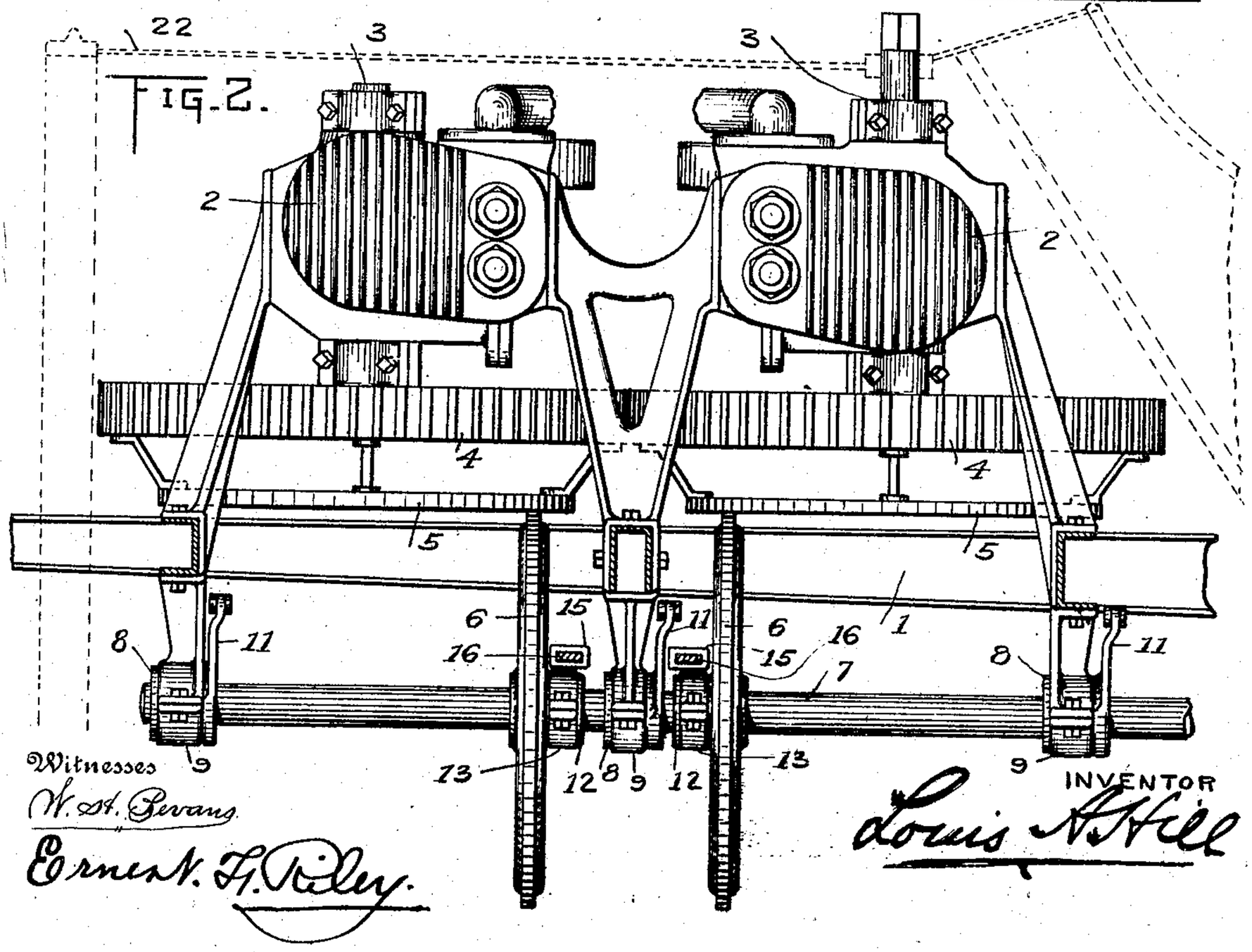


FIG. 2.



Witnesses

W. A. Bevans.

Ernest F. Riley.

INVENTOR

Louis A. Hill

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3 SHEETS—SHEET 2.

FIG. 3.

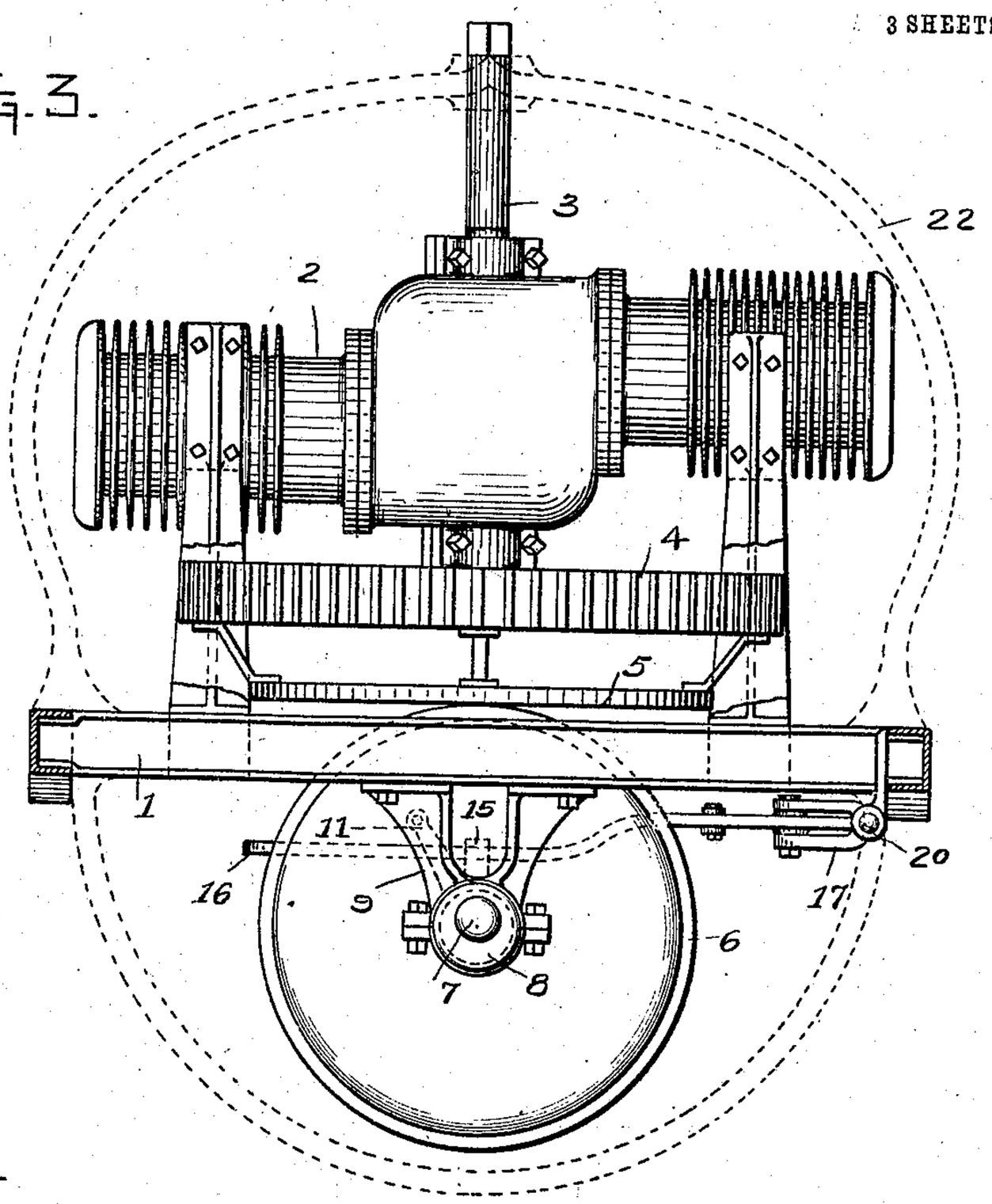


FIG. 4.

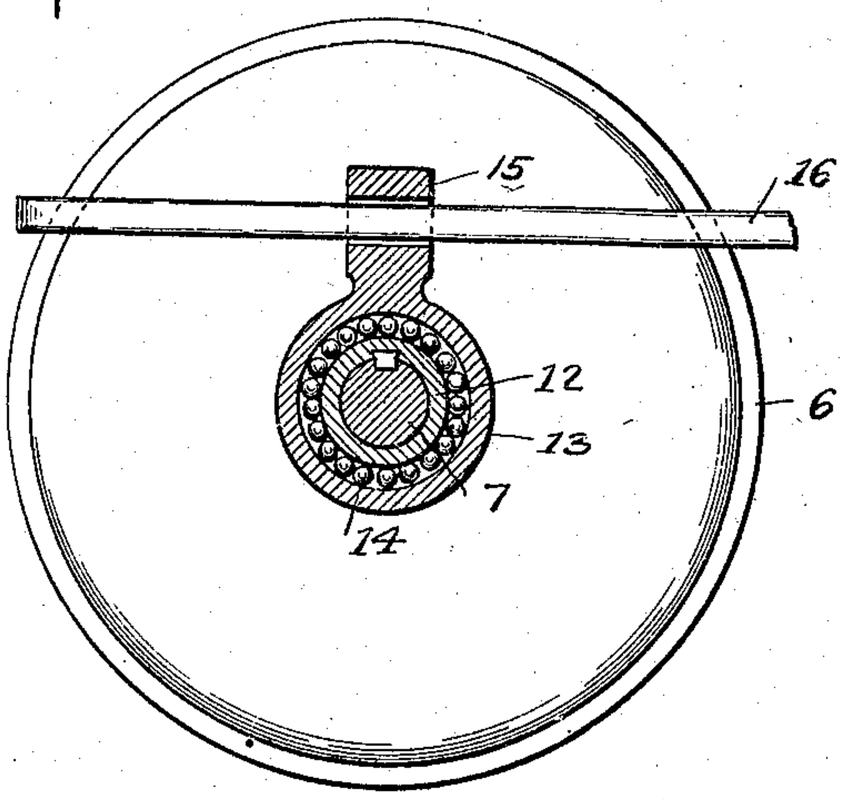
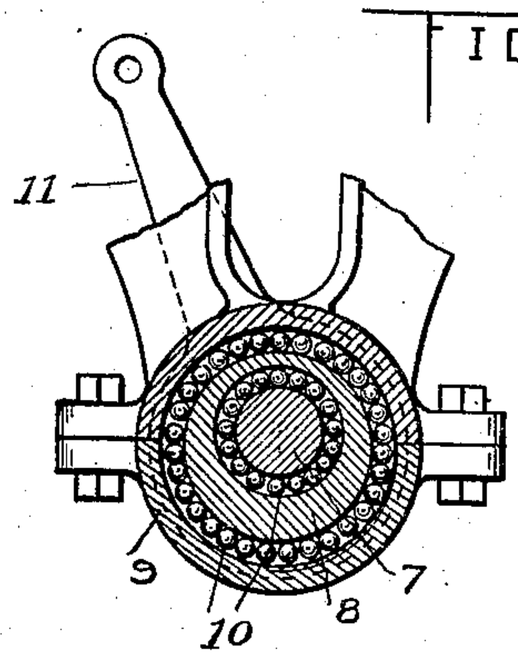


FIG. 5.



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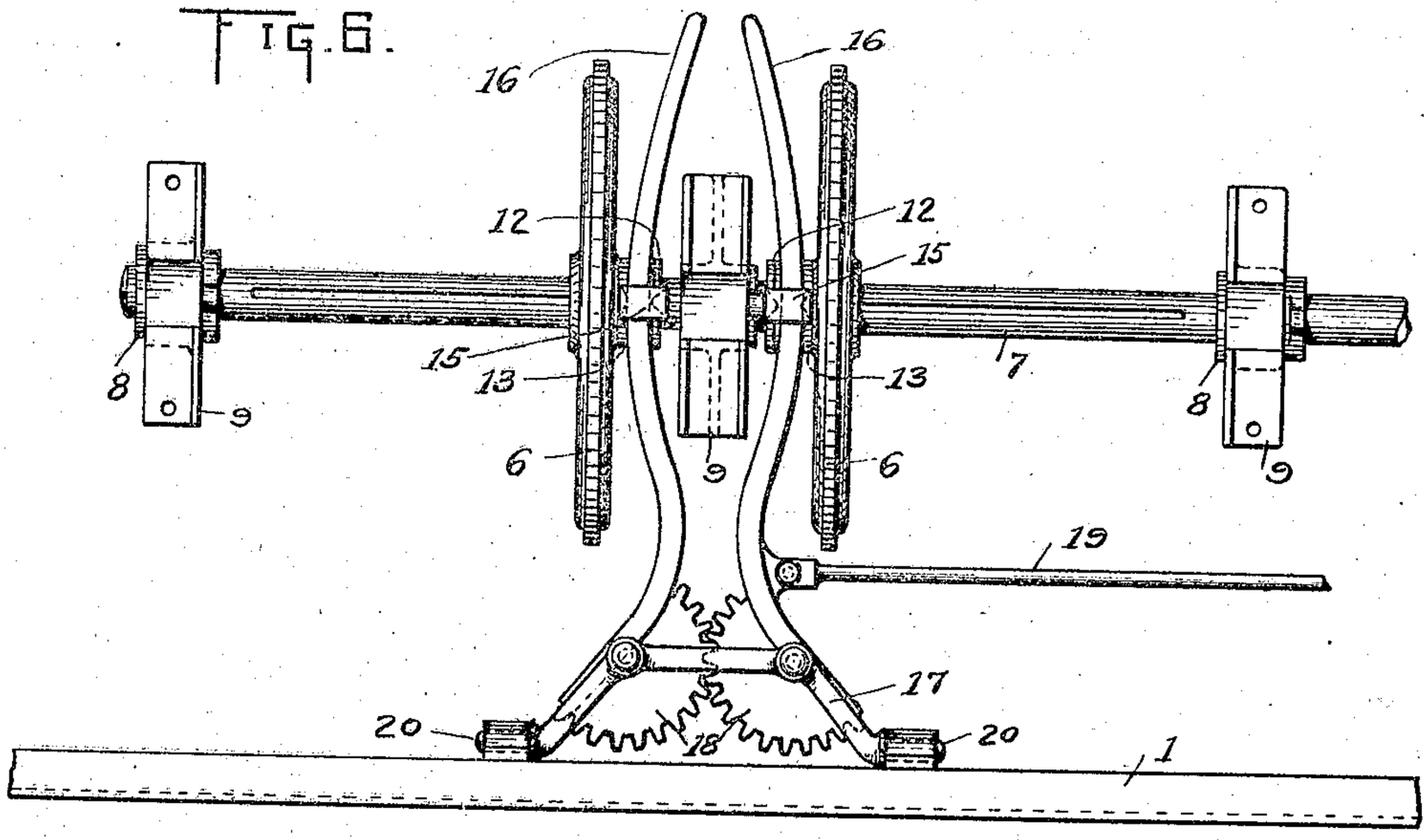
3 SHEETS—SHEET 3.

FIG. 6.



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Louis A. Hill

UNITED STATES PATENT OFFICE.

LOUIS A. HILL, OF WASHINGTON, DISTRICT OF COLUMBIA.

DRIVING MECHANISM.

No. 915,858. Specification of Letters Patent. Patented March 23, 1909.

Application filed May 16, 1908. Serial No. 438,194.

To all whom it may concern:

Be it known that I, LOUIS A. HILL, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Driving Mechanism, of which the following is a specification.

This invention relates to improvements in motor-vehicles and boats, and the object is to so arrange the parts as to utilize the gyrostatic action of the fly-wheel for maintaining equilibrium of the car or boat and to provide a peculiarly advantageous placing of the parts—that is, the motor, transmission and cooling means.

Figure 1 is a top plan view of two motors and driving mechanism constructed and arranged in accordance with my invention. Fig. 2, an end elevation of the same. Fig. 3, a side elevation. Fig. 4, a sectional detail view showing the manner of attaching the shifting levers to the friction wheels. Fig. 5, a similar view showing arrangement of the parts for shifting the drive shaft to throw the friction wheels into and out of engagement with the friction disks. Fig. 6, an elevation showing the means for shifting the friction wheels on the drive shaft.

Referring now more particularly to the drawings, the numeral 1 designates the supporting frame upon which the motors 2 are mounted. These motors may be of any preferred type and are so mounted that their crank-shafts 3 are disposed vertically. Each shaft carries horizontally beneath the motors, a fly-wheel 4 provided about its periphery with gear teeth, the fly-wheel of one shaft meshing with that of the other shaft. These shafts are driven in reverse directions. This arrangement of parts and disposition of the fly-wheels is for the purpose of utilizing the gyrostatic action of the fly-wheels to maintain the equilibrium of the automobile or boat despite road irregularities or roughness of water; to offer no resistance to a change of longitudinal direction, and to minimize the tendency toward skidding or capsizing when making sharp turns at speed. The placing of the fly-wheels as described also renders it possible to more advantageously arrange the variable speed mechanism as will fully appear hereinafter.

Attached to and supported below the lower face of each fly-wheel is a friction-disk 5, adapted to be engaged by friction-wheels 6 slidable on a drive-shaft 7. This shaft is supported eccentrically in sleeves 8 which in turn are mounted upon hangers 9. Ball bearings 10 are provided for both the shaft and the sleeves. The sleeves supporting the respective ends of the shaft carry arms 11 by means of which they may be rotated in the hangers to effect the movement of the shaft to swing the friction-wheels into and out of engagement with the friction-disks. Suitable levers may be operatively connected with the arms 11 for rocking the sleeves.

Each friction-wheel is formed with a hub 12 on which a sleeve 13 is mounted, ball-bearing 14 being provided whereby the wheel rotates freely in the sleeve. Each sleeve is formed with a perforated lug or arm 15 to receive a shifting-lever 16. These levers 16 are pivotally attached at their lower end to a supporting bracket 17 and are geared together through the medium of segments 18. An operating rod 19 is operatively connected to one of the said levers. By moving this rod in one direction the friction-wheels are simultaneously moved toward the centers of the friction-disks and by moving it in a reverse direction said wheels are moved away from the centers of the disks. By moving the friction-wheels past the centers of the friction-disks a reverse movement of the drive-shaft is obtained. The supporting bracket 17 is hinged at 20 to swing in the direction of movement of the drive-shaft as the latter is moved to swing the friction-wheels into and out of engagement with the friction-disks.

The vertical placing of the crank-shafts permits the weight of the fly-wheels and disks to be carried by the friction-wheels when the car or boat is running instead of being carried constantly on the crank-shaft journals as would be the case if the crank-shafts were disposed horizontally. The employment of two fly-wheels makes it possible to use two friction-wheels against the faces of the two fly-wheel disks. This arrangement of vertical crank-shafts with horizontal fly-wheels and friction-disks operating with double friction traversing wheels, speed change and reverse on one drive shaft combine a peculiarly advantageous and symmetrical construction of the power and transmission mechanism.

The fly-wheels are cast in the form of suction-fans 21 as shown in Fig. 1, and the friction-disks are supported below the lower faces of the fly-wheels, thus leaving an annu-

lar space for the escape of air between the fly-wheels and disks, producing sufficient air current through the motor hood 22 to effectively carry off the hot air from the radiating flanges of an air-cooled motor or to cool the circulating water in the forwardly placed radiator of a water-cooled motor.

I have already set forth some of the advantages of my invention. It may be added that in multicylinder engines, the long crank-shaft of the usual tandem placing of the cylinders is eliminated, while for efficient air-cooling, the air-current is thrown directly and equally upon and carried past the horizontally placed cylinders.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In a motor-driven car or boat, motors having vertically disposed crank-shafts, and fly-wheels carried thereby disposed horizontally, the fly-wheel of one shaft being geared with that of the other shaft, a drive-shaft, and transmitting gears for transmitting motion to the drive shaft from each of the motors.

2. In a motor-driven car or boat, a motor having a vertically disposed crank-shaft, and a fly-wheel carried thereby disposed horizontally and formed with fan-blades, a drive-shaft, and transmitting gears for transmitting motion to the drive shaft from the motor.

3. In a motor-driven car or vessel, motors having vertically disposed crank-shafts, fly-wheels carried thereby disposed horizontally, said fly-wheels being geared together, friction-disks carried by the fly-wheels, a drive-shaft, friction-wheels movable on the drive-shaft to engage the disks at different points, means for simultaneously moving said wheels on said shaft, and means for moving the wheels into and out of engagement with the disks.

4. In a motor-driven car or vessel, motors having vertically disposed crank-shafts, fly-wheels carried thereby disposed horizontally, said fly-wheels being geared together, friction-disks carried by the fly-wheels, a rocking drive-shaft, friction-wheels slidable on said drive-shaft to engage the disks at different points, means for simultaneously moving said wheels on said shaft, and means for effecting the rocking of the said shaft to swing said wheels into and out of contact with the disks.

5. In a motor-driven car or vessel, motors having vertically-arranged crank-shafts, fly-wheels carried thereby disposed horizontally, friction-disks carried by the fly-wheels, a drive-shaft, friction-wheels slidable on the shaft to engage the disks at different points, levers for effecting the movement of said wheels carrying intermeshing segments, and means for actuating one of said levers.

6. In a motor-driven car or vessel, motors having vertically-arranged crank-shafts, fly-wheels carried thereby disposed horizontally, friction disks carried by the fly-wheels, a drive-shaft, friction-wheels slidable on said shaft, means for swinging said shaft to bring the friction-wheels into and out of contact with the friction-disks, a support pivoted to swing in the direction of movement of shaft, levers pivoted to said support and engaging the friction-wheels for sliding the latter on the shaft, and intermeshing segments carried by said levers.

7. In a motor-driven car or boat, motors having vertically-disposed crank-shafts, fly-wheels carried by said shafts arranged horizontally, a drive-shaft, and means for transmitting motion from each of said crank-shafts to said drive-shaft.

8. In a motor-driven car or boat, motors having vertically-disposed crank-shafts, fly-wheels carried thereby arranged horizontally, a drive-shaft, and transmitting gears for transmitting motion to the drive-shaft from each of the motors.

In testimony whereof I have affixed my signature in presence of two witnesses.

LOUIS A. HILL.

Witnesses:

ERNEST F. RILEY,

CHARLES B. OSBORN.