

No. 667,842.

Patented Feb. 12, 1901.

H. S. INGALLS.
STEERING MECHANISM FOR VEHICLES.

(Application filed Apr. 9, 1900.)

(No Model.)

2 Sheets—Sheet 1.

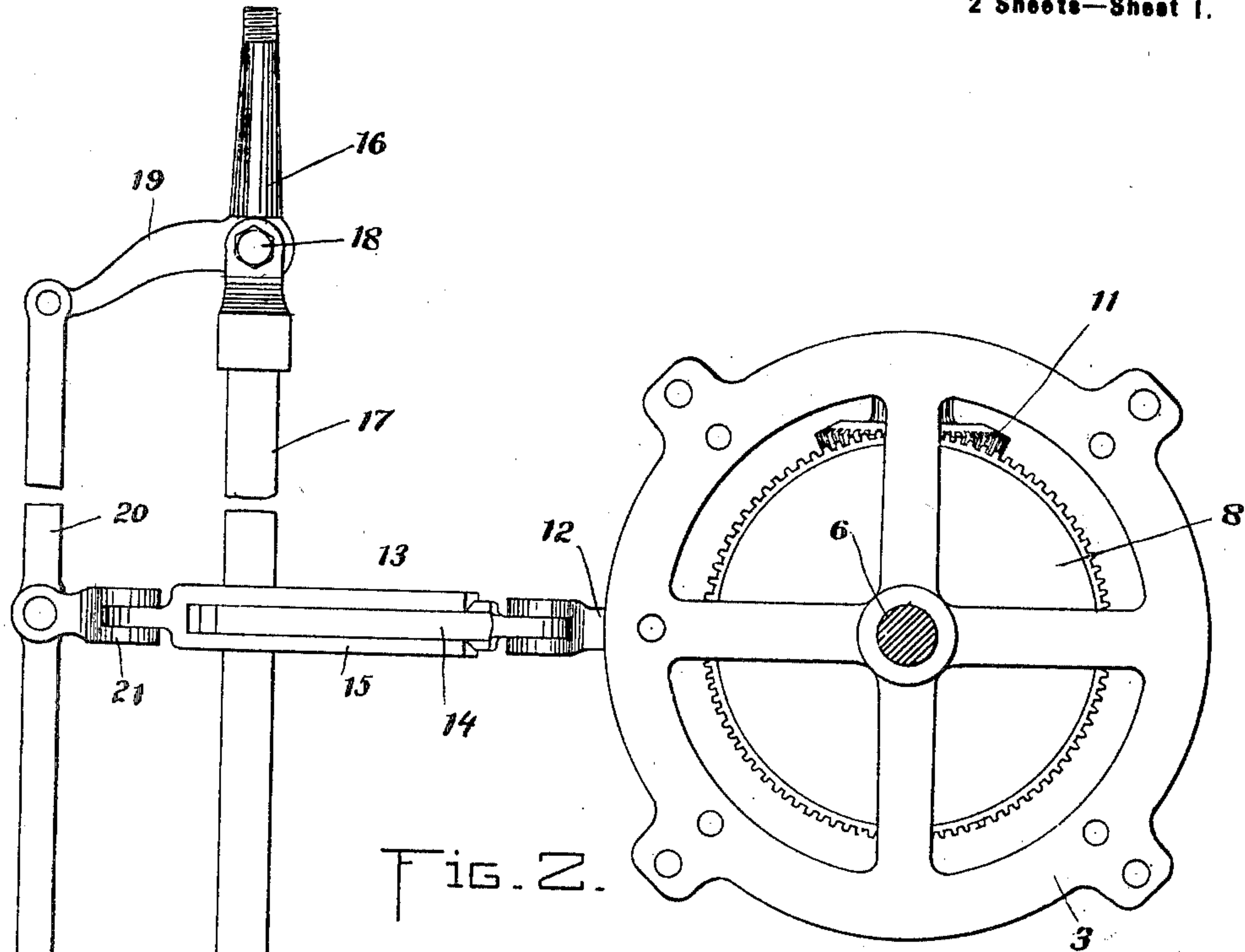


Fig. 2.

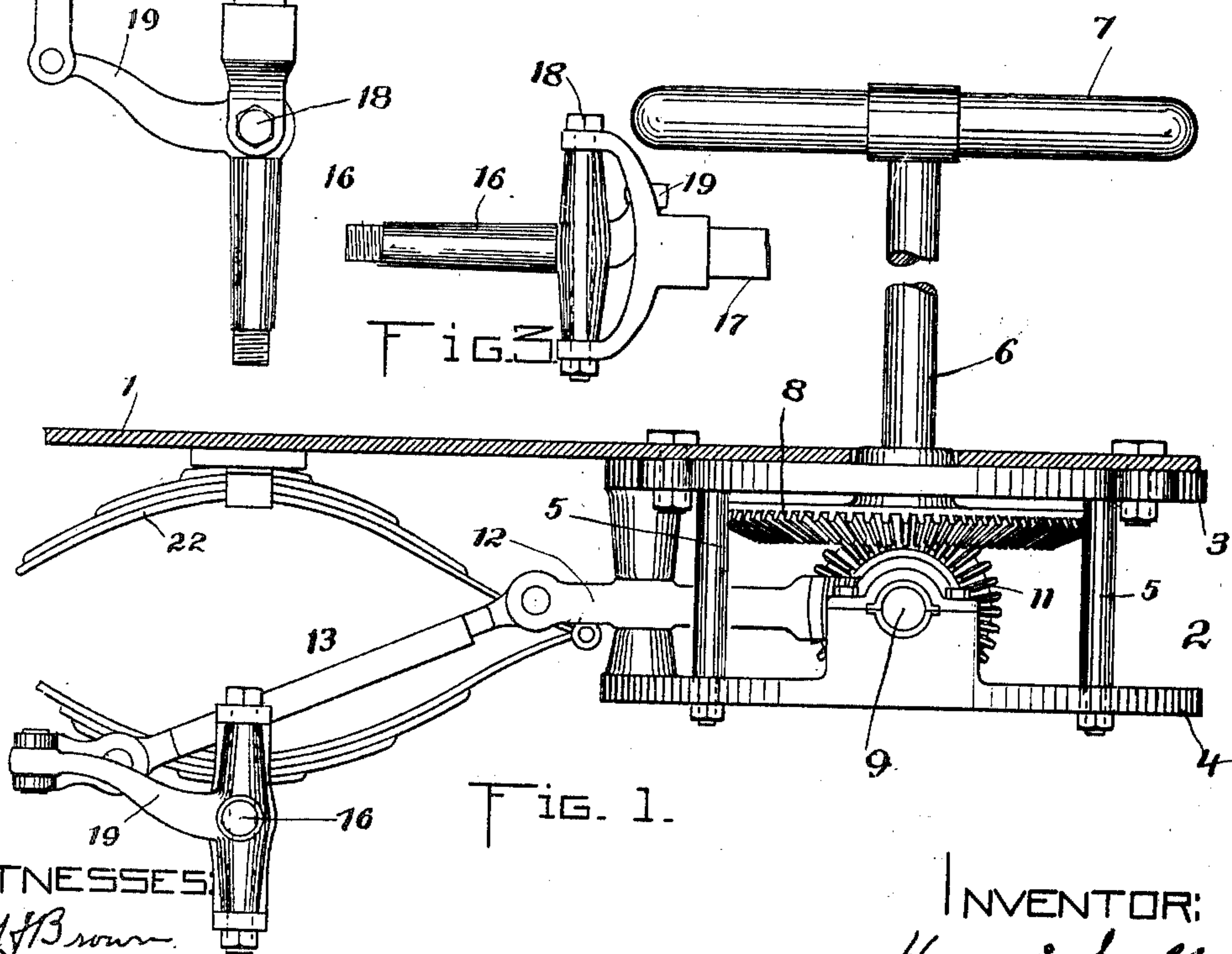


Fig. 1.

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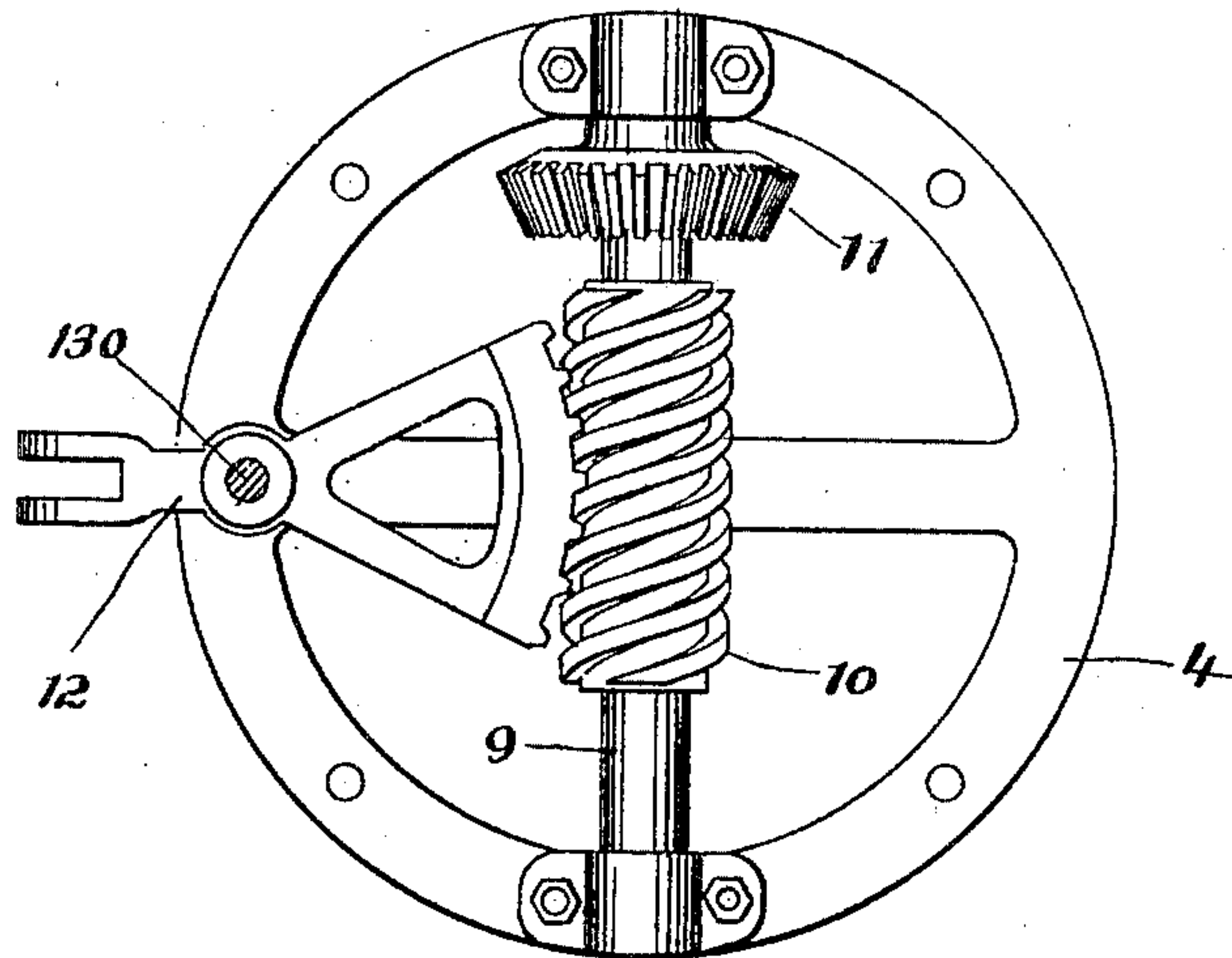


FIG. 4.

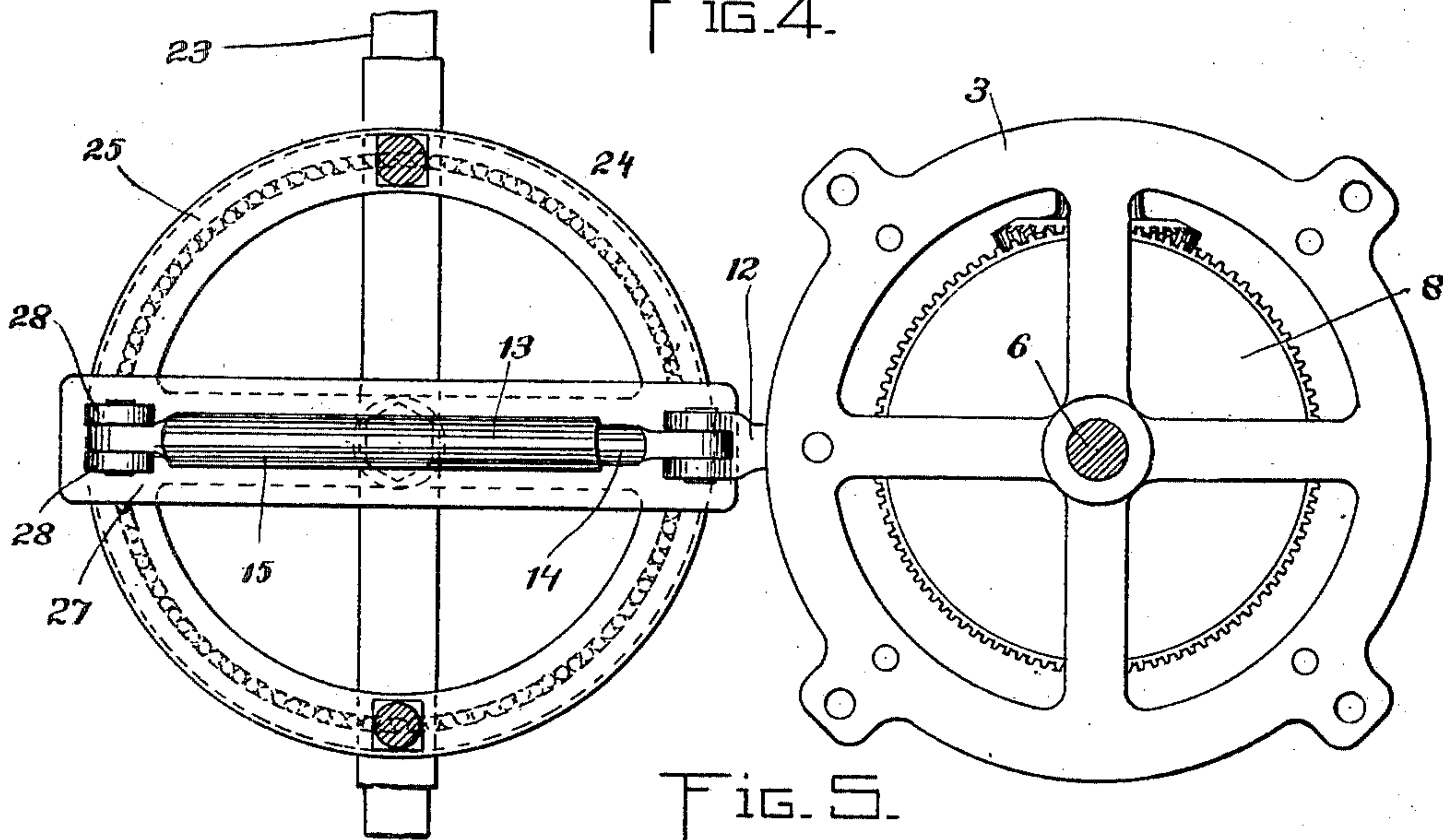


FIG. 5.

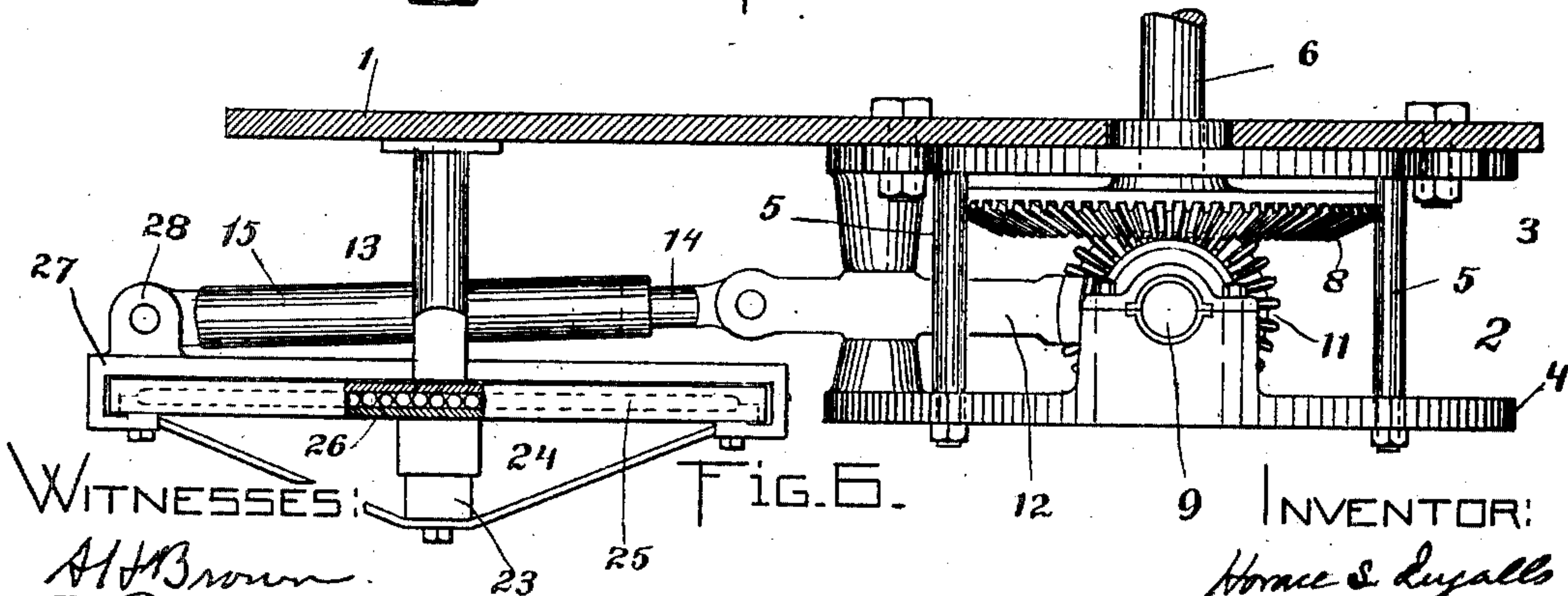


FIG. 6.

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HORACE S. INGALLS, OF SAUGUS, MASSACHUSETTS.

STEERING MECHANISM FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 667,842, dated February 12, 1901.

Application filed April 9, 1900. Serial No. 12,170. (No model.)

To all whom it may concern:

Be it known that I, HORACE S. INGALLS, of Saugus, in the county of Essex and State of Massachusetts, have invented certain new and
5 useful Improvements in Steering Mechanism for Vehicles, of which the following is a specification.

This invention relates to steering mechanisms for automobile and other vehicles; and
10 it has for its object to provide a positive or locked mechanism which will stand in the position to which it is moved without putting strain upon the hand of the operator and will at the same time turn the steering-wheels to
15 the desired extent without an undue movement of the handle or operating device.

The invention consists in certain features of construction and arrangement, which I shall now proceed to describe and claim.

20 Of the accompanying drawings, Figure 1 represents a side elevation of one embodiment of my invention with a part of the vehicle-body in section. Fig. 2 represents a plan view thereof. Fig. 3 represents a detail rear
25 elevation of one of the wheel-axes. Fig. 4 represents a plan view of the lower frame-plate and worm mechanism. Fig. 5 represents a plan view of another embodiment of my invention. Fig. 6 represents a side ele-
30 vation of said embodiment.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, 1 designates the floor of the vehicle-body, and 2 designates a
35 frame bolted to said floor on the lower side thereof and consisting of upper and lower plates 3 4, connected by vertical rods 5 5.

6 is a vertical operating-shaft journaled in the upper plate 3 and having at its upper end
40 an operating-handle 7 and at its lower end, between the plates 2 3, a horizontal bevel-gear 8. The operating-handle is shown in the form of a cross-bar; but it may be a wheel, lever, or other suitable handle. Journaled
45 on the lower frame-plate 4 is a horizontal worm-shaft 9, having a worm 10 and a bevel-gear 11, which meshes with the gear 8 and is preferably of smaller diameter than said gear 8.

50 12 is a lever pivoted at 130 between the frame-plates 3 4 in such manner as to oscillate in a horizontal plane and having at its

rear end a toothed segment meshing with the threads of the worm 10. As said worm is ro-
tated by the rotation of the handle 7 the le- 55
ver 12 will be oscillated on its pivot. The front end of the lever is forked and is pivotally attached to the rear section 14 of an ex-
tensible or telescopic arm 13, the front sec- 60
tion 15 of which is pivotally attached to a device movable laterally or crosswise of the vehicle to turn the steering-wheels.

Two distinct types of steering mechanism are commonly employed for automobile ve-
hicles, and my invention is applicable to 65
either type. One type (shown in Figs. 1 to 3, inclusive) comprises short wheel-axes independently pivoted to a relatively-fixed support or supports and having a link connec-
tion whereby they are caused to move in-com- 70
mon. 16 16 represent said short wheel-axes, and 17 represents the relatively-fixed support, consisting in this instance of a cross-
bar, upon which the vehicle-body is supported through the medium of springs 22 and to 75
which the axles 16 16 are pivoted at 18 18, so as to oscillate in a horizontal plane. To the axles 16 are affixed forwardly-projecting arms 19 19, connected by a link 20, the movement of which in a lateral direction crosswise of 80
the vehicle causes the axles 16 to be oscillated and the steering-wheels to turn. The forward section 15 of the telescopic arm 13 is pivotally attached to the link 20 through the medium of a short link 21, having horizontal ears 85
embracing the long link 20 and vertical ears embracing the arm-section 15. As the lever 12 is oscillated it causes the arm 13 to sweep to one side or the other of a median line, and hence imparts a wheel-turning movement to 90
the axles 16. All transverse strains imparted to the link 20 from the steering-wheels have a tendency to oscillate the lever 12; but as the teeth of said lever are held between the threads of the worm 10 the latter, if its pitch 95
be kept within certain limits, will not be caused to rotate, and hence the strain from the wheels is not felt by the hand of the operator. At the same time, because of the re-
lation of the gears 8 11 and the distance from 100
the front end of the telescopic arm to the pivotal point 130 as compared with the distance from said pivotal point to the worm, a relatively small movement of the handle 7 will

impart the desired turning movement to the steering-wheels. The other type of steering construction is that employing the fifth-wheel, to which in Figs. 5 and 6 my invention is shown as applied. The construction, as far as the telescopic arm and the mechanism for actuating the same are concerned, is substantially the same as hereinbefore described. The steering-wheels, however, are attached to the ends of a single axle 23, adapted to oscillate about a central point or pivot, and thereby turn the steering-wheels. 24 represents a fifth-wheel consisting of an upper section 25 and a lower section 26, between which antifriction-rollers are preferably interposed. The vehicle-body 1 is attached to the upper section 25 and the axle 23 is attached to the lower section 26. A fixture consisting of a plate or bar 27, bolted to the lower section 26, extends above and spans the fifth-wheel and is provided with vertical ears 28 28, between which the front section 15 of the extensible or telescopic arm 13 is pivoted. The front end of the bar 27 or of the lower fifth-wheel section constitutes a device movable laterally or transversely of the vehicle to turn the steering-wheels. Obviously the telescopic arm in this latter embodiment may be attached either to the front or rear side of the fifth-wheel. The telescopic arm in both embodiments compensates for the varying distances existing between the front end of the lever 12 and the laterally-movable device which turns the steering-wheels in the different positions occupied by the steering mechanism. Said telescopic arm also compensates for the varying distances existing between said lever and laterally-movable device due to the vertical movements of the vehicle-body relatively to the wheels, the means for actuating said telescopic arm being all carried by the vehicle-body itself, and therefore insuring steadiness of the steering-handle.

I claim—

1. A steering mechanism for automobile vehicles, comprising a worm, an operating-handle geared with and adapted to rotate said worm, and a toothed and pivotally-supported lever engaging said worm, all carried by the vehicle-body and vertically movable rela-

tively to the wheels, a device movable laterally or crosswise of the vehicle to turn the wheels, and an extensible or compensating connection interposed between said device and said lever.

2. A steering mechanism for automobile vehicles, comprising a worm, an operating-handle geared with and adapted to rotate said worm, and a toothed and pivotally-supported lever engaging said worm, all carried by the vehicle-body and vertically movable relatively to the wheels, a device movable laterally or crosswise of the vehicle to turn the wheels, and an extensible or telescopic arm pivotally attached at one end to said device and at the other end to said lever.

3. A steering mechanism for automobile vehicles, comprising a worm, an operating-handle geared with and adapted to rotate said worm, and a toothed and pivotally-supported lever engaging said worm, all carried by the vehicle-body and vertically movable relatively to the wheels, the independently-pivoted short wheel-axles having arms, a link connection between said arms, and an extensible or telescopic arm pivotally attached at one end to said connection and at the other end to said lever.

4. A steering mechanism for automobile vehicles, comprising, in combination with a vehicle-body vertically movable relatively to the wheels, a frame bolted thereto and consisting of upper and lower plates, a horizontal bevel-gear journaled in the upper plate, a handle connected with and adapted to operate said gear, a horizontal worm journaled on the lower plate and having a bevel-gear on its shaft meshing with the first said bevel-gear, a toothed lever pivotally supported on the frame and engaging the worm, a device movable laterally or crosswise of the vehicle to turn the wheels, and an extensible or compensating connection interposed between said device and said lever.

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

HORACE S. INGALLS.

Witnesses:

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A. D. HARRISON.