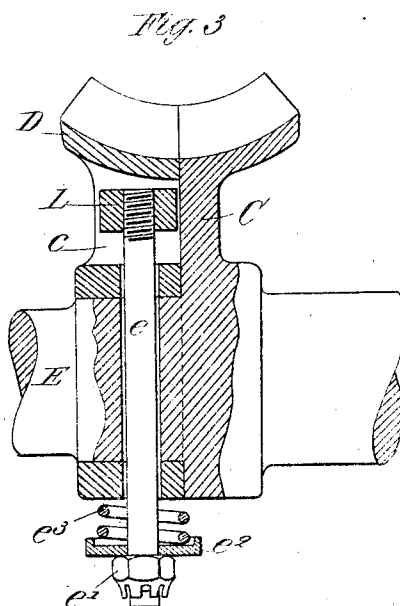
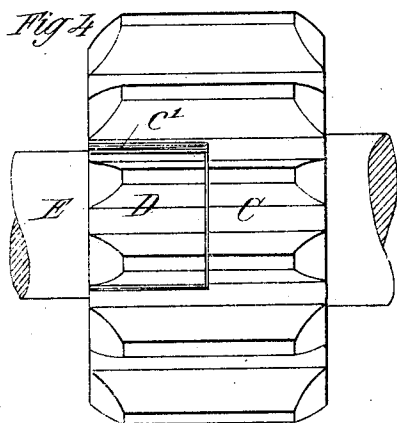
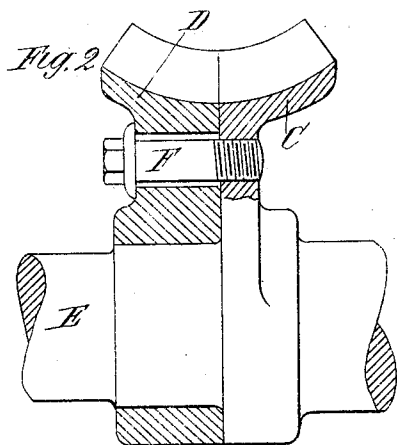
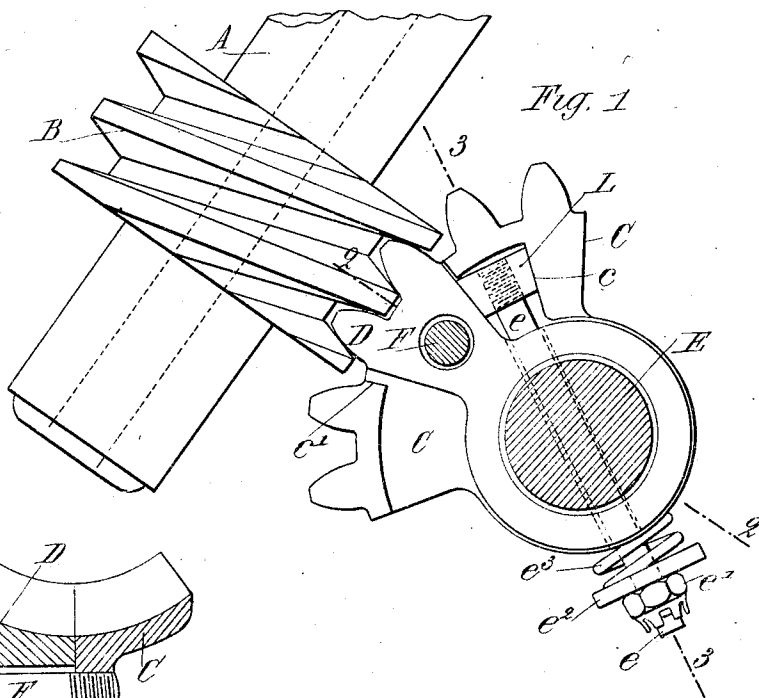


No. 792,964.

PATENTED JUNE 20, 1905.

E. D. CAHEN.
GEARING.

APPLICATION FILED FEB. 8, 1905.



WITNESSES
P. W. Wright
Walter Abbott

INVENTOR
Emile David Cahen
BY
Howson and Howson
HIS ATTORNEYS.

UNITED STATES PATENT OFFICE.

EMILE DAVID CAHEN, OF PARIS, FRANCE, ASSIGNOR TO SOCIÉTÉ ANONYME D'ELECTRICITÉ ET D'AUTOMOBILES MORS, OF PARIS, FRANCE.

GEARING.

SPECIFICATION forming part of Letters Patent No. 792,964, dated June 20, 1905.

Application filed February 8, 1905. Serial No. 244,801.

To all whom it may concern:

Be it known that I, EMILE DAVID CAHEN, a citizen of the French Republic, of 7 Avenue Niel, Paris, France, have invented a certain new and useful Improved Gearing, of which the following is a full, clear, and exact description.

This invention relates to gearing, and particularly to the steering-gear for automobile carriages, and has reference to means for insuring the automatic take up of any slack or play which after some time of working always appears in the gearing between the worm and segment or between the equivalent devices employed.

The arrangement which is the subject of the present invention is shown as applied to the steering-gear for automobiles, where it insures the automatic taking up of any play due to wear, so that the steering-gear always immediately responds to the steering-wheel without any backlash.

The invention is hereinafter described with reference to the accompanying drawings, in which—

Figure 1 is a side elevation. Figs. 2 and 3 are cross-sections on lines 2 2 and 3 3 of Fig. 1. Fig. 4 shows a front view of the segment.

The mechanism illustrated is constructed on the worm-and-segment principle of steering. The lower end of the steering-column is indicated at A and its worm at B, together forming an ordinary worm-shaft. The segment is composed of a main body C, having the general shape of the usual segment, but is provided at one side with a rectangular space or cut-out portion in which is located a small sector D, the teeth of which are cut similarly to those of the main segment C, and this small sector completes the main segment.

The complementary sector D is mounted upon and can revolve on the shaft E of the main segment. It is held in position by a bolt F, which prevents it from moving sidewise. The hole in the complementary sector, through which this bolt passes, is a little larger than the latter or, if desired, of oval section, so as to allow when required an angular movement

of the complementary sector, and this movement need be only a very small one. The main segment forms laterally a shell or deck, so that between its end wall *c* and the wall of the complementary sector D may be located a small block L, forming a wedge fast to a rod *e*, passing through the socket or boss of the sector D and the shaft E. This rod *e* is continued beyond the boss of the sector, and a nut *e'* is screwed upon its extremity, holding a washer *e''* against a spring *e'''*, which holds the washer *e''* away from the boss and exerts a constant pull of the rod *e* on the wedge L. The result of this action is that the complementary sector D is continually caused to bear toward the face *c'* of the flange of the cut-away portion of the main segment and that the toothed portion of the complementary sector D tends to move relatively to the fixed portion represented by the main segment C. In these conditions the segment constantly and closely engages with the worm, and when the steering-wheel is rotated by the driver there is no backlash in the steering-gear.

Since the complementary sector occupies only an arc of the main segment, the take up of play occurs only in this portion of the segment, and the steering-gear is so constructed that this corresponds with progression in a straight line or with steering-angles of small deflection, which constitutes the portion of the segment most frequently in engagement with the worm. In extreme steering-angle positions or locks the taking up of play or backlash is not necessary, because in these parts of the segment the wear is not to be feared, because of the comparatively rare use of such parts.

The inclinations of the faces of the wedge L and of the corresponding faces of the main segment and the complementary sector are suitably determined, so that this wedge is not reversible—that is to say, by the pressure which it receives from the complementary sector it will not be pushed away, compressing the spring *e'''*.

I claim as my invention—

1. A gear for the automatic take up of back-

lash, comprising a shaft, a toothed segment thereon having a cut-away portion, a complementary sector pivoted to said shaft, and a spring-actuated wedge between said segment and said sector permanently acting in one direction on said sector.

2. A gear for the automatic take up of backlash, comprising a shaft, a toothed segment thereon having a cut-away portion, a sector completing the toothed periphery of said segment, and a spring-actuated wedge between said segment and said sector permanently acting against said sector.

3. A gear for the automatic take up of backlash, comprising a shaft, a toothed segment thereon having a cut-away portion, a toothed sector within said cut-away portion pivoted to said shaft and a spring-actuated wedge between the sides of said segment and said sector

permanently acting on said sector in one direction.

4. Steering-gear for automobiles, comprising a shaft, a toothed segment thereon having a cut-away portion, a complementary sector within said cut-away portion pivoted to said shaft, a spring-actuated wedge between the sides of said segment and said sector permanently acting on said sector in one direction, and a worm-shaft against which said segment and sector are kept in close engagement.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMILE DAVID CAHEN.

Witnesses:

CHARLES DONN,

GUSTAVE DUMONT.