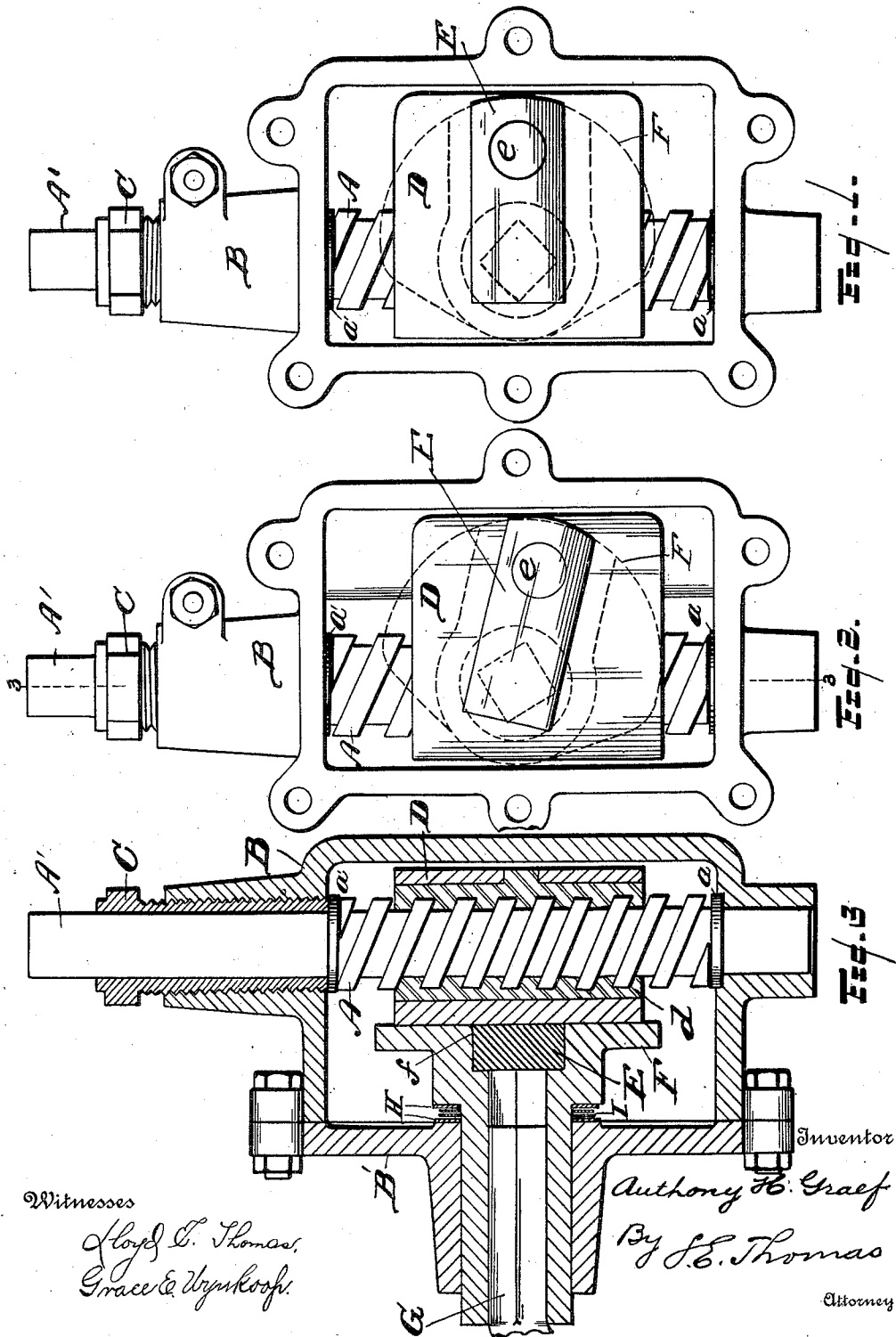


APPLICATION FILED MAY 18, 1910.

998,611.

Patented July 25, 1911.

2 SHEETS—SHEET 1.

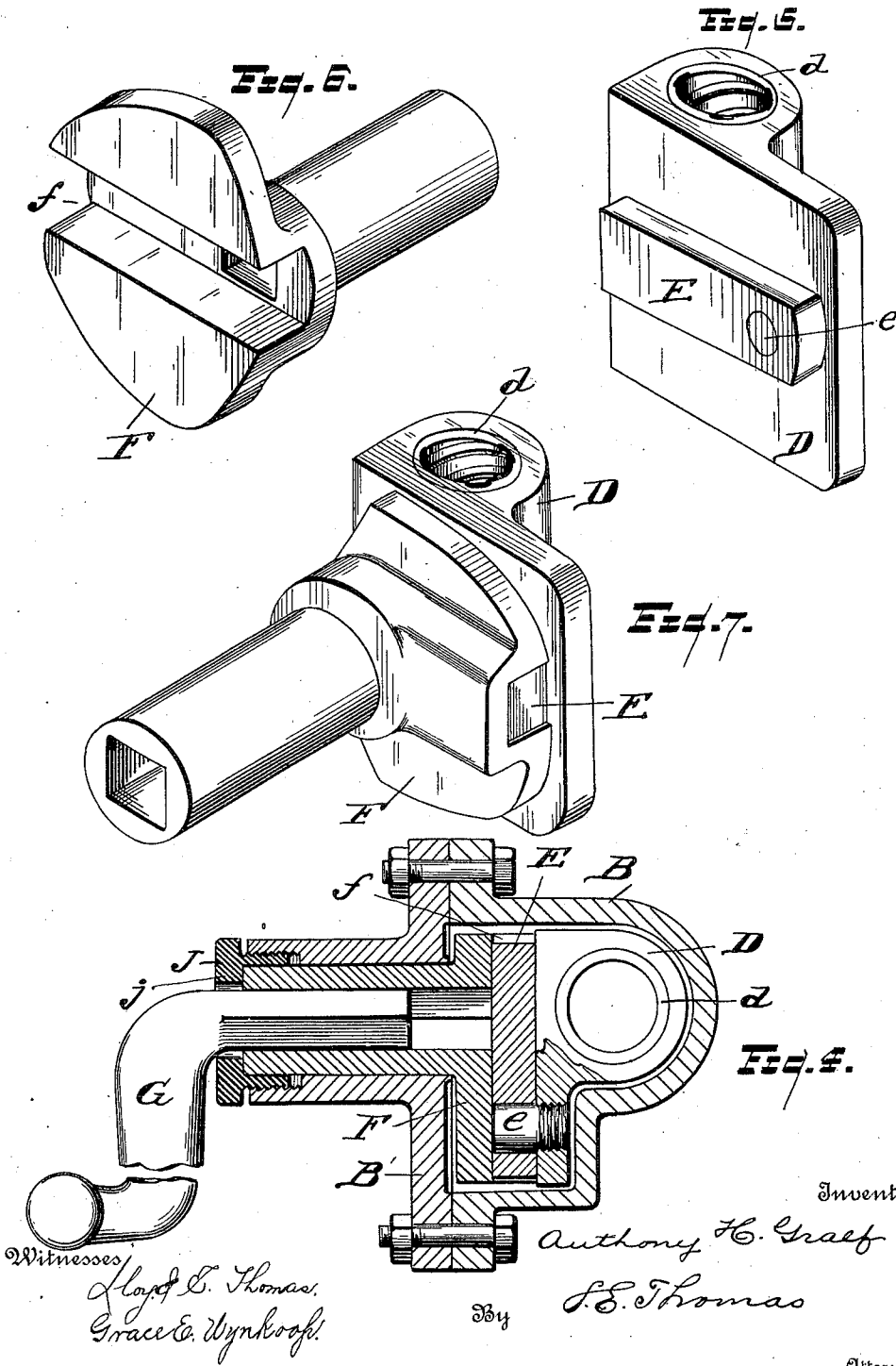


A. H. GRAEF.
STEERING GEAR.
APPLICATION FILED MAY 18, 1910.

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2 SHEETS-SHEET 2.



UNITED STATES PATENT OFFICE.

ANTHONY H. GRAEF, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-HALF TO PAUL ARTHUR, OF DETROIT, MICHIGAN.

STEERING-GEAR.

998,611.

Specification of Letters Patent.

Patented July 25, 1911.

Application filed May 18, 1910. Serial No. 561,935.

To all whom it may concern:

Be it known that I, ANTHONY H. GRAEF, citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Steering-Gears, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in steering gears for vehicles, shown in the accompanying drawings and more particularly described in the following specification and claim.

The object of this invention is to simplify the construction and the cost of assembling the device by reducing the number of parts while at the same time maintaining its efficiency.

In the drawings accompanying this specification: Figure 1 is a side elevation of a portion of the steering column and its worm shaft,—the cover of the case inclosing the latter being removed to more clearly show the construction of the parts acting in conjunction with the worm shaft. Fig. 2 is a similar view indicating the traveling nut in a relatively different position to that disclosed in Fig. 1, showing the rocker arm as rotated by the action of the rocker block, in dotted lines. Fig. 3 is a sectional view on line 3—3 of Fig. 2. Fig. 4 is a horizontal cross-sectional view in line with the shaft of the rocker arm. Fig. 5 is a perspective view of the traveling nut showing the rocker block pivoted thereto. Fig. 6 is a perspective view of the rocker arm showing the depression formed therein to receive the rocker block. Fig. 7 is a perspective view with the traveling nut, rocker block, and rocker arm assembled.

Referring now to the letters of reference placed upon the drawings:—A is the worm integral with the steering column A' journaled in the inclosing case B.

a and a' are thrust washers sleeved on the steering column respectively located above and below the worm.

C is an adjusting nut sleeved on the steering column having a screw-threaded engagement with the case, serving as one of the journals for the steering column and as a means to take up any endwise movement or play of the worm shaft.

D is the traveling nut formed with a babbitted bearing d to receive the worm.

E is a rocker block pivoted to the traveling nut by means of a pin e, on which it is loosely sleeved.

F is a rocker arm journaled in the cover B' of the inclosing case B, provided with a depression f in its inner face to receive the rocker block E.

G is a crank arm secured to the shaft of the rocker arm in turn connected with mechanism (not shown) for giving direction to the wheels of the vehicle.

H are washers sleeved on the shaft of the rocker arm, between which is lodged the helical spring I, designed to take up play and to hold the face of the rocker arm in intimate relation with the traveling nut.

In Fig. 4 I have shown an annular nut J encircling the crank arm G and threaded to engage the hub of the cover B' in which the rocker arm F is journaled,—the nut being provided with a projecting flange j adapted to bear upon the end of the rocker arm F, whereby end play may be taken up and the parts adjusted.

Having indicated the several parts by reference letters, the operation of the device will be readily understood. Upon turning the steering column in the customary manner, the traveling nut D, on the worm shaft, is caused to raise or lower in accordance with the direction in which the column is rotated, thereby actuating the rocker arm by means of the swinging block pivoted to the traveling nut, and thereby the crank arm G, by which the steering of the vehicle is effected through the usual connecting mechanism.

Having thus described my invention, what I claim is:—

5 A steering gear comprising a shaft clutched to the steering mechanism, a plate eccentrically mounted on the end of said shaft and having a diametrical slot in its face, a vertical worm shaft having a steering handle on its upper end, a nut working on said worm shaft, a second plate integrally formed
10 on the side of said nut, a block pivoted at

its end to said plate, and an adjustable member for forcing said two plates into contact to take up wear between said block and its slot.

In testimony whereof, I sign this specification in the presence of two witnesses.

ANTHONY H. GRAEF.

Witnesses:

GRACE E. WYNKOOP,
SAMUEL E. THOMAS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
