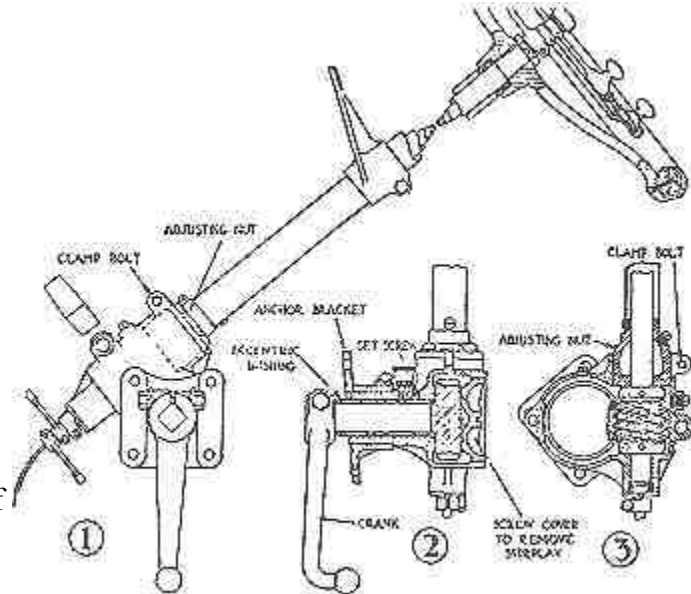


## ADJUSTMENT, CARE AND LUBRICATION OF THE WARNER STEERING GEAR

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WHEN the steering gear leaves the manufacturer it is packed with grease sufficient to care for from 4000 to 5000 miles of service. During this time the grease cup on the hub of the case should be kept refilled and at the end of 4000 to 5000 miles the pipe plug on the case barrel should be removed and the barrel filled with grease.

A good grade of graphite grease is recommended, and it is advisable to carefully add a small amount of cylinder oil, as the grease may not work into all of the parts. Several oil holes will be found in the hubs of the spark and throttle levers and a few drops of light oil should be placed here monthly. The hub of the steering wheel spider should likewise receive oil at the same time. -If this is neglected there is a possibility of rust forming and the absence of an oil cushion promotes the possibility of noise.



### ADJUSTMENTS

In general there are three ways in which wear is evidenced. The first is by up-and-down motion in the steering column, the second side-play in the worm gear, and the third back-lash in the steering wheel.

Before any adjustments are made it is advisable to see that the steering gear is at fault. This is not often the case. Back-lash frequently occurs in some part of the wheel gear linkage. When this is the case if the steering gear be tightened, the parts may be pinched together, causing injury.

In making steering wheel adjustments, therefore, it is advisable to first disconnect one end of the reach-rod so that the steering gear will be isolated and the adjustments made without interference of other working parts. After this, the front wheels may be jacked from the ground; the various ball and socket joints lubricated and adjusted and the wheels trammed. It is needless to emphasize the care necessary in making these adjustments.

## **REMOVING UP-AND-MOTION**

In the course of a long period of service the gear may wear to such an extent that there is a slight up-and down motion in the steering column. This may be removed by tightening the large adjusting nut, shown in the drawings, at the top of the thrust bearing directly over the worm. The first step is to loosen the clamp bolt Fig. 1, at the top of the case. The adjusting nut is then turned until the up-and-down motion is removed. It should not be tightened beyond the point where the lost motion is removed, as to do so would pinch the bearing and increase the friction. After this adjustment is made the clamp bolt should again be tightened, to hold the adjusting nut in position.

## **REMOVING SIDE-PLAY**

Side-play in the worm gear is evidenced by the lateral motion in the cross member attached to the crank. This may be removed by taking up on the screw cover, screwing directly into the inner side of the steering gear case (Fig. 2). The clamp bolt passing through the edge of the case is first loosened and the cover screwed in until the lost motion is removed. At the same time there should be no binding and the clamp bolt must be again tightened after the adjustment is made.

## **REMEDY FOR WORN GEAR TREADS**

After a long period of service the worm gear threads may become worn to such an extent that there is play between the worm gear teeth and the threads of the worm. This is evidenced by lost motion at the crank. The remedy is to turn the worm gear until new teeth are brought into contact, and this is done in the following manner:

1. Loosen the clamp bolt and remove the crank on the gear shaft.
2. Turn the gear one-quarter revolution.
3. Replace the crank and clamp it in place.

By this a new quarter of the worm gear is brought into use and this adjustment can be repeated from time to time until all four quarters have been brought into play. The amount of adjustment thus possible is usually more than equivalent to the life of the rest of the car. But if all of these adjustments fail to take out the lost motion the worm gear can be adjusted closer to the worm by means of the eccentric bushing carried on the shank of the worm gear. This bushing is loosened by means of a set screw in the hub of the steering gear case. If this has been loosened the eccentric bushing can be turned by means of notches milled in its outer end.

The steering gear is usually mounted by use of an anchor bracket previously bolted or riveted to the side member of the car frame. This bracket clamps upon the barrel section of the steering gear case and by loosening the clamp the gear may be set in any desired angle. Another bracket hinged to the shaft is generally used to further support the steering column. By adjusting on these the steering gear may be shifted to meet the necessities of any special body that is being constructed. Due to the fact that the steering gear is commonly the first unit assembled to the frame in constructing a car it is not ordinarily readily removed. Most adjustments can be made without the removal and it is not advisable to remove the assembly unless conditions make it absolutely necessary.