

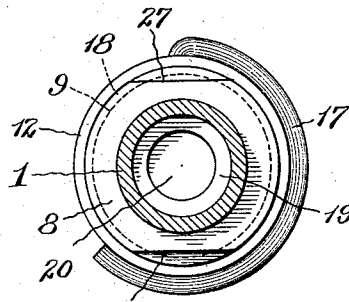
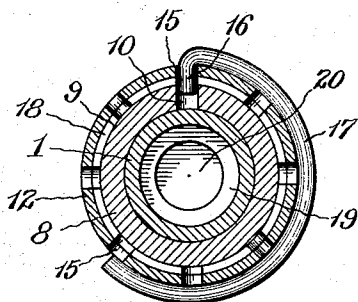
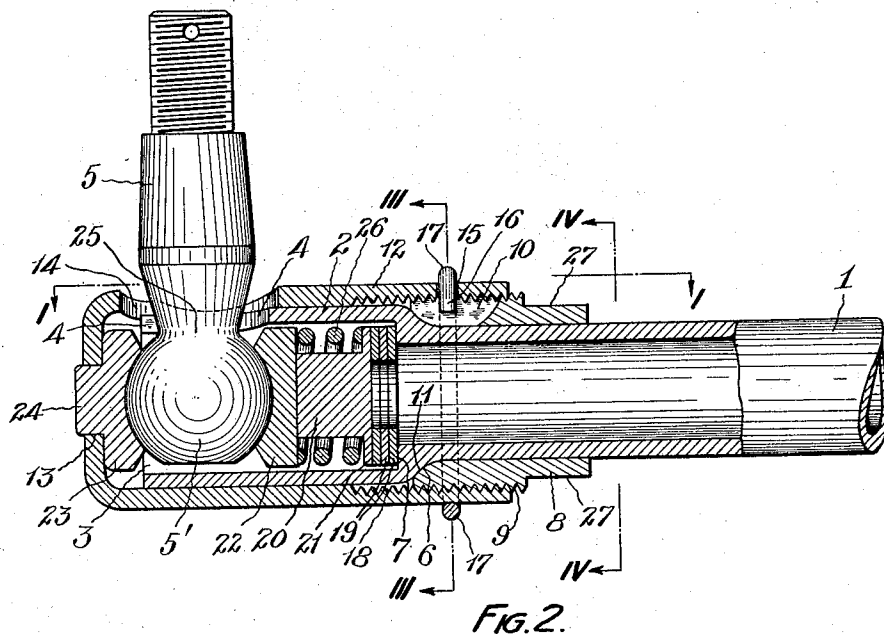
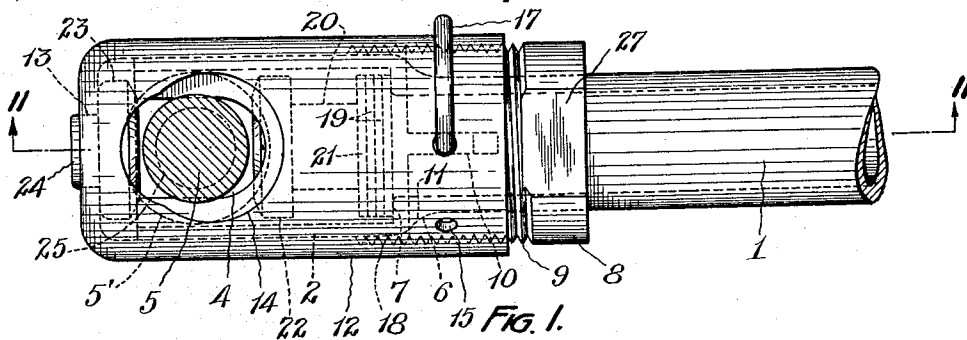
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TIE ROD OR THE LIKE

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UNITED STATES PATENT OFFICE.

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TIE ROD OR THE LIKE.

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Our invention relates to assemblies for tie-rods or the like, and particularly to tie-rods for automotive vehicles and which form a part of the steering gear thereof, its object being to provide a tie-rod simple and economical of construction and efficient in the performance of its function.

The said invention consists of means hereinafter fully described and particularly set forth in the claims.

The annexed drawing and the following description set forth in detail certain means embodying our invention, the disclosed means, however, constituting but one of the various mechanical forms in which the principle of the invention may be employed.

In said annexed drawing:

Figure 1 represents a side elevation of one end of a tie-rod assembly embodying our invention.

Fig. 2 represents an axial section of such rod-end assembly, showing connected parts in elevation.

Fig. 3 represents a section taken on line III—III, Fig. 2.

Fig. 4 represents a section taken on line IV—IV, Fig. 2.

The illustrated embodiment of our invention includes a main or intermediate member 1 (in this case tubular in form), of which one end portion is, or both end portions are, formed with an expanded or enlarged tubular socket 2, the outer extremity of which is open as shown at 3, Fig. 2. This end is intersected by a slot 4 through which the associated journal member 5 projects as shown in Fig. 2, and may be slid endwise out of the socket. The member 5 is formed with the spherical bearing portion 5' forming the reduced neck 25 and the slot 4 is of less width than the diameter of bearing 5' as shown in Fig. 1. The neck portion 25 is adapted to fit in the slot 4.

The said socket is provided with an exterior shoulder 6 and an interior abutment shoulder 7, as is required.

Seated against said shoulder 6 and on the reduced part of the intermediate member 1 is a rotatable sleeve 8, externally threaded as at 9 and having a longitudinally extending slot 10 intersecting its outer end surface at one end. The interior shoulder 11 of the sleeve is preferably made to conform with the shape of the shoulder 6, as shown.

Surrounding the socket 2 is a cup-shaped

cap 12, whose bottom end is formed with a central round hole 13, and with an enlarged opening 14 registering with the slot 4 and through which the member 5 also projects and through which it may pass.

A plurality of circumferentially spaced holes 15 pierces the inner end portion of the cap's shell, through one of which the offset end 16 of an elastic locking-member 17 projects into the slot 10, Fig. 3.

The interior of the cap is provided with a thread 18 which engages the exterior thread 9 of the sleeve.

The interior of the socket is provided with shims 19 lying against the shoulder 7, and abutting said shims is an abutment member 20 formed with a flange 21. While we have shown the shims, it will be understood that they may be dispensed with where the dimensions of the member 20, blocks 22 and 23, and diameter of bearing 5' are such as to render them unnecessary for procuring the desired adjustment of the internal bearing member. Against the outer end of member 20 lies a bearing block 22 and against the bottom of the cap lies a second bearing-block 23 formed with a boss 24 removably seated in the hole 13. Between the two blocks 22 and 23 is held the ball-shaped or universal journal 5' of the journal-member 5.

A coil-spring 26 in a state of compression is located between the block 22 and flange 21 and holds the blocks 22 and 23 against the journal 5' to take up wear and to prevent rattling, as will be understood.

The sleeve 8 is formed with two oppositely disposed flat surfaces 27 for the reception of a wrench.

In the case of a tie-rod for automotive vehicles, the other end thereof is also formed in the manner above described, as will be understood.

To dismount the said structure for the purposes of replacement or repair of parts, the offset end 16 of the elastic member 17 is first pried out of engagement with the slot 10 and the hole 15 through which it projects, and said member removed. A wrench is then applied to the surfaces 27 of the sleeve and the latter turned so as to disengage its threads from the threads of the cap 12. This will permit the cap and the journal member 5 to be slid endwise off at the intermediate member 1, whereby all

of the parts may be separated, as will be readily apparent.

In assembling the structure, the shims 19 when required, are first placed in the interior of the socket against the shoulder 7, the abutment member 20 then placed against the shims, and the spring 26 (in its expanded or distended condition) placed in position around the said member 20, after which the bearing block 22 is placed against the end of the abutment member. The bearing block 23 is then placed in position in the cap with its boss projecting into the hole 13, after which the bearing member 5 is passed through the enlarged opening 14 and placed in engagement with the said bearing block 23. The cap is then slipped over the socket and pushed inwardly in the direction of its axis as far as the expanded spring 26 will permit, the sleeve 8 then brought up against the end of the cap and rotated so as to cause the sleeve's threads to engage the cap threads. This rotation is continued until the shoulder 11 of the sleeve comes into contact with the shoulder 6 of the socket. The continued rotation of the sleeve will thereupon draw the cap 12 still further inwardly over the socket, compressing the spring 26 and until the bearing block 22 abuts the end of the abutment member 20, or as nearly so as possible, and at the same time allow one of the holes 15 of the cap to register with the slot 10 of the sleeve. Locking member 17 is then placed in position by springing same and allowing the offset end 16 to pass through the said registering holes 15 and into the slot 10. This locking member thus prevents the relative rotation of the sleeve and cap and the consequent disturbance of the required relationship of these parts, as will be readily apparent.

When the parts are assembled as shown, the sides of the slot 4 will prevent the member 5 from being inadvertently removed, by engaging the journal 5', should such member 5 become disengaged from the blocks 22 and 23.

It will be understood that when both ends of the intermediate member are formed as

above described and hence with an enlargement forming a socket, the two sleeves 8 which would be required in such event, are slipped onto the intermediate member before the second socket is formed, or in the case where a socket is formed by welding a previously formed socket member to the end of an intermediate tube or rod, before the socket member is so welded.

By means of the above-described structure, therefore, it will be seen that the required connection is made between the tie-rod itself and the bearing member 5 and the latter is brought very close to the end of such rod.

Inasmuch as tie-rods are utilized in connection with the steering mechanism mounted on the front axle of an auto-motive vehicle, the tie-rod assembly described is particularly applicable for use in connection with the steering mechanism for auto-motive vehicles which include brakes on the front wheels, all as will be readily understood by those skilled in the art.

What we claim is:

1. In a tie-rod or the like, the combination of a main member provided with open-ended socket portion having a ball-slot intersecting its open end; a cap fitting over said socket and provided with a ball opening; a member mounted upon said main member and adjustably connected with said cap; and means for holding said adjustably connected member against movement outwardly along said main member.

2. In a tie-rod or the like, the combination of a main member provided with an enlarged end socket portion forming an exterior shoulder, and having an end ball-slot; a hollow cap fitting over said socket, extending over said main member beyond said shoulder, and formed with a ball opening; and a member mounted upon the main member behind said shoulder and having threaded engagement with the inner end portion of said cap; said engaging member adapted to abut said shoulder.

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