Nov. 17, 1925. 1,561,972

F. C. CRAWFORD

DRAG LINK ELEMENT

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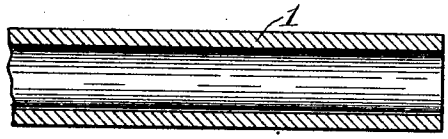


FIG. 1.

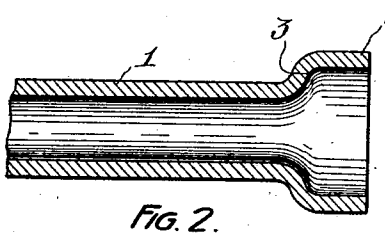


FIG. 2.

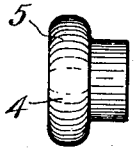


FIG. 3.

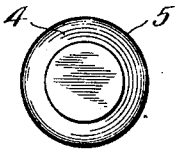


FIG. 4.

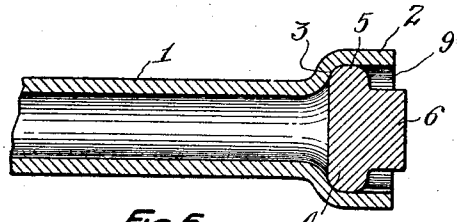


FIG. 5.

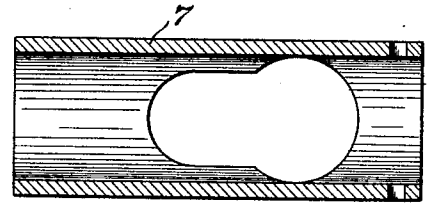


FIG. 6.

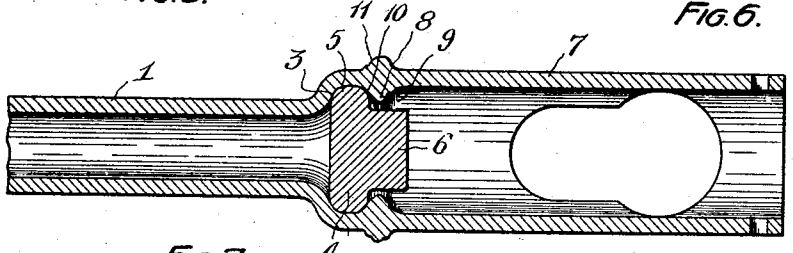


FIG. 7.

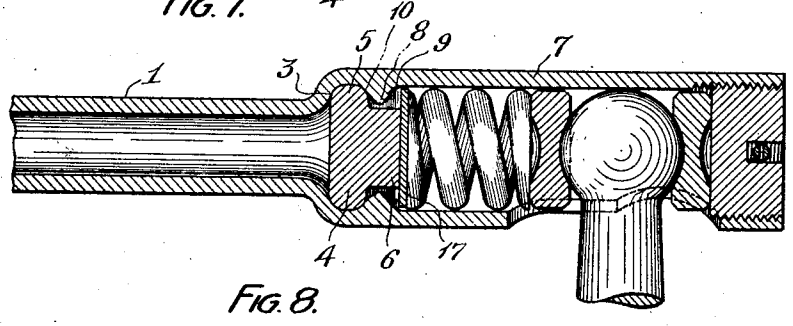


FIG. 8.

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DRAG LINK ELEMENT

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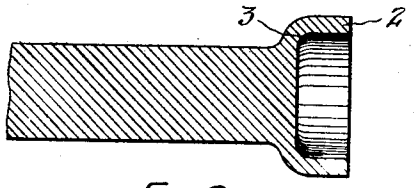


FIG. 9.

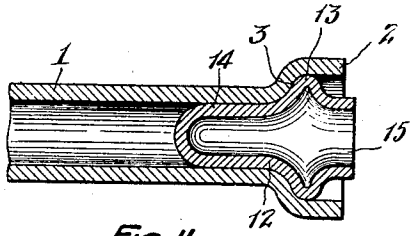


FIG. 11.

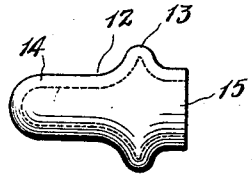


FIG. 10.

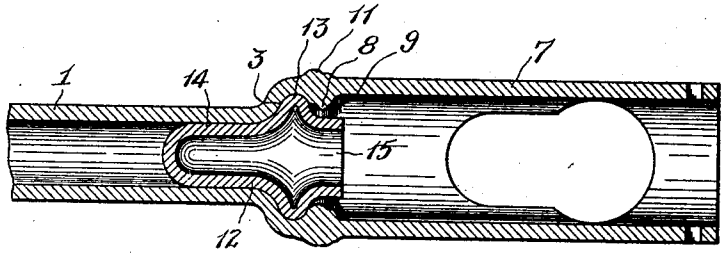


FIG. 12.

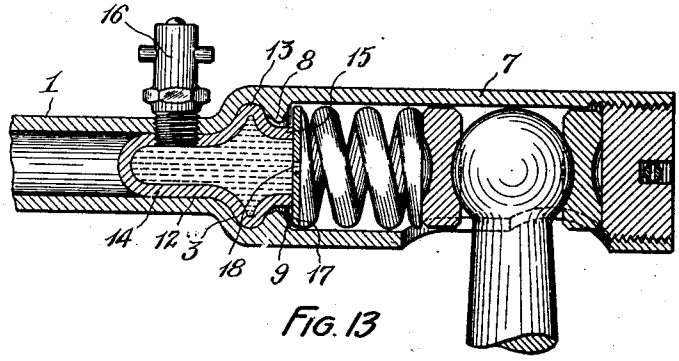


FIG. 13

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Patented Nov. 17, 1925. 1,561,972

UNITED STATES PATENT OFFICE.

FREDERICK C. CRAWFORD, OF DETROIT, MICHIGAN, ASSIGNOR TO THE STEEL PRODUCTS COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

DRAG-LINK ELEMENT.

Application filed January 11, 1923. Serial No. 612,143.

To all whom it may concern:

Be it known that I, FREDERICK C. CRAWFORD, a citizen of the United States, resident of Detroit, county of Wayne, and State of Michigan, have invented new and useful Improvements in Drag-Link Elements, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to elements for use in drag-links, tie-rods or the like, forming part of the steering mechanism of automotive vehicles such as automobiles and trucks.

The object of the invention is to produce a device of the above-described character, which may be economically manufactured and which will be efficient in the performance of its function.

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

More specifically, my invention consists of a modification of the invention shown, described and claimed in application Serial No. 612,144 filed even date herewith, by Matthew P. Graham for a patent on a drag-link element and method of making same, whereby the principles of said Graham invention may be applied to a structure in which the main or body member of the element, is tubular.

The annexed drawings and the following description set forth in detail certain means embodying my invention, the disclosure, however, constituting but one of various ways in which the principle of my said invention may be applied.

In said annexed drawings:

Fig. 1 represents an axial section of the end portion of a tubular member from which the body member of my invention is constructed.

Fig. 2 represents an axial section of said end portion after the first step in the operation has been completed.

Fig. 3 represents a side elevation and Fig. 4 an end view of the abutment member forming part of the device.

Fig. 5 represents an axial section showing the end of the body member and the abutment member assembled.

Fig. 6 represents an axial section of the socket member which is to be welded to the flange on the body member.

Fig. 7 represents an axial section of the end of the body member, the abutment member in place and the socket member welded thereto.

Fig. 8 represents an axial section of a completed drag-link and associated parts of which the element included in my invention forms a part.

Fig. 9 represents an axial section of the end of a modified form of the main or body member which may be substituted for the tubular member shown in Fig. 2.

Fig. 10 represents a side elevation of a modified form of abutment member.

Fig. 11 represents an axial section of the end portion of a tubular body member showing the modified form of abutment member associated therewith.

Fig. 12 represents an axial section of the end of a drag-link element in which the modified form of abutment member is used and prior to its completion.

Fig. 13 represents an axial section of a completed drag-link element and associated parts, in which the said modified form of abutment member is used.

Referring first to the construction shown in Figs. 1 to 8 inclusive, in carrying out my invention I first take a tubular member 1 and upset same to form an end flange 2 of larger diameter than that of said tube 1. I then place in the flange cavity and against the shoulder 3 formed thereon, an abutment member 4. This member consists of a cylindrical portion 5 of a diameter substantially equal to the interior diameter of the flange 2, and a cylindrical portion 6 of reduced diameter, the inner peripheral portion of the part 5 being preferably made to conform in contour with the said shoulder, as shown in Fig. 5. A tubular socket member 7 is then butt-welded to the end of the flange 2, the dimensions of the parts being such that the intruded metal 8 formed during the welding operation will flow into the annular space 9 formed between the part 6 of the abutment member and the socket, and engage the outer surface 10 of the part 5 of said abutment member. The latter is thereby secured in place in the socket and the part 6 thereof projects into the socket cavity, as shown in Fig. 7. The outer ex-

truded metal or burr 11 is then ground off or otherwise removed.

The outer end of the abutment member extends beyond the welded joint and forms a stop for the associated parts of the drag-link, as shown in Fig. 8. The extruded metal 8 being located in the annular space forms no impediment or obstruction to the placing of these parts within the socket, as will be readily seen, and as in the case of the Graham invention above referred to.

The above process of construction may be applied to a body member formed out of solid stock such as is shown in Fig. 9 as will be readily understood by those skilled in the art.

In Figs. 10 to 13 inclusive, is illustrated a structure practically identical with the previously described device, but in which the abutment member 12 is pressed or otherwise formed into a cup-shape having an intermediate diametrically enlarged portion 13 which seats against the shoulder 3 as shown in Fig. 11. The closed end portion 14 of this member 12 is of an exterior diameter substantially equal to the interior diameter of the body member 1 and extends into the latter. As before, the tubular socket member 7 is welded to the flange 2 and the intruded metal 8 engages the portion 13 and secures the abutment member in place. The open end portion 15 projects into the socket cavity and beyond the weld.

The extruded metal or burr 11 is then removed and the element is then ready for the reception of the associated drag-link parts.

This last described structure may be further amplified by providing a lubricating connection 16 passing through the member 1 and the abutment member 12, as shown in Fig. 13 whereby the interior of said abutment member may be supplied with a suitable lubricant. In this case the end plate 17 which forms one of the associated parts of the drag-link is provided with a central aperture 18 through which such lubricant may reach the interior of the socket, all as will be readily understood by those skilled in the art.

Claims covering the method herein disclosed are included in a separate application filed by me on March 15, 1924, and bearing Serial Number 699,422.

What I claim is:

1. In a device of the class described, the combination with a body member consisting of a main member provided with an end flange, and a tubular member welded to said flange to form a socket; of a separate member seated in said socket against the inner shoulder thereof and having a portion projecting into the socket cavity and beyond the weld.

2. In a device of the character described, the combination with a body member consisting of a main member provided with an end flange, and a tubular member welded to said flange so as to form an end socket; of a separate member seated in said socket against the inner shoulder thereof and having a portion of reduced diameter projecting into the socket cavity and beyond the weld.

3. In a device of the class described, the combination with a body-member provided with an end socket having a welded joint intermediate of its ends; of a separate member seated in said socket against the inner shoulder thereof and held between said shoulder and the intruded metal of said joint.

4. In a device of the class described, the combination with a body-member provided with an end socket having a welded joint intermediate of its ends; of a separate member provided with a portion of substantially the same diameter as that of the interior of said socket and a portion of reduced diameter; that portion of said separate member of larger diameter being seated against the inner shoulder of said socket and held between said shoulder and the intruded metal of said joint; said portion of reduced diameter projecting into the socket cavity.

5. In a device of the character described, the combination with a tubular body-member provided with an end socket; of a hollow cup-shaped member formed with a portion intermediate of its ends and of enlarged diameter; said separate member having said enlarged portion seated against the interior shoulder of said socket and one end portion seated in said body-member; whereby a portion of less diameter than said enlargement is caused to project into said socket.

6. In a device of the character described, the combination with a body member formed with an end flange, and a tubular member welded to said flange so as to form an end socket; of a separate hollow member seated in said socket against the inner shoulder thereof and having a portion of reduced diameter projecting into the socket cavity and beyond the weld.

Signed by me this 3d day of January, 1923.

F. C. CRAWFORD.