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AXLE STUB-REMOVING TOOL

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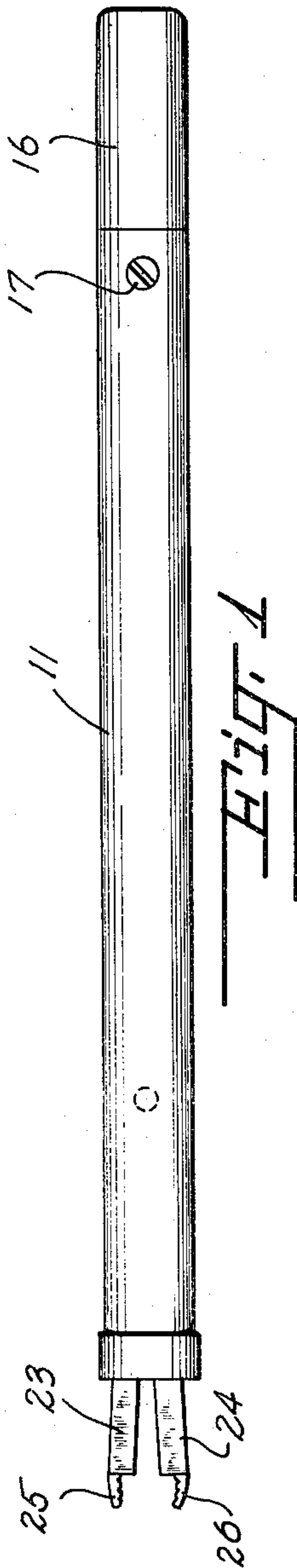


Fig. 1

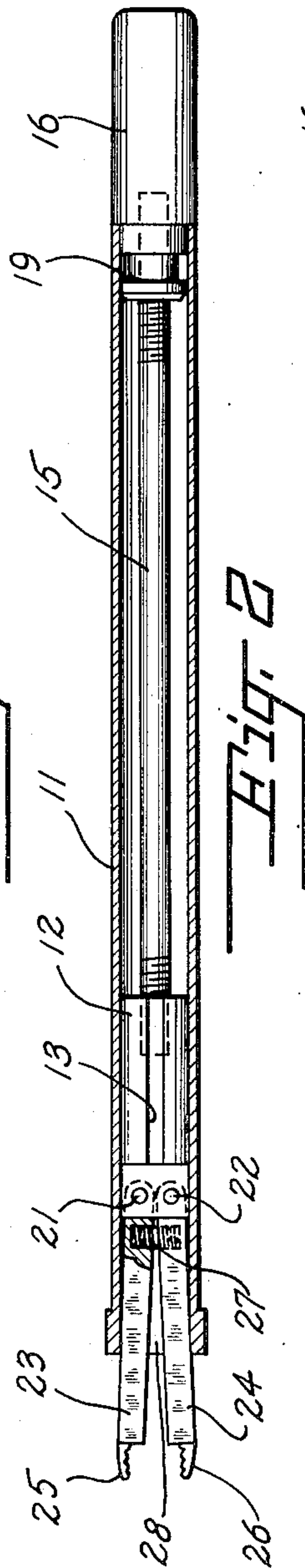


Fig. 2

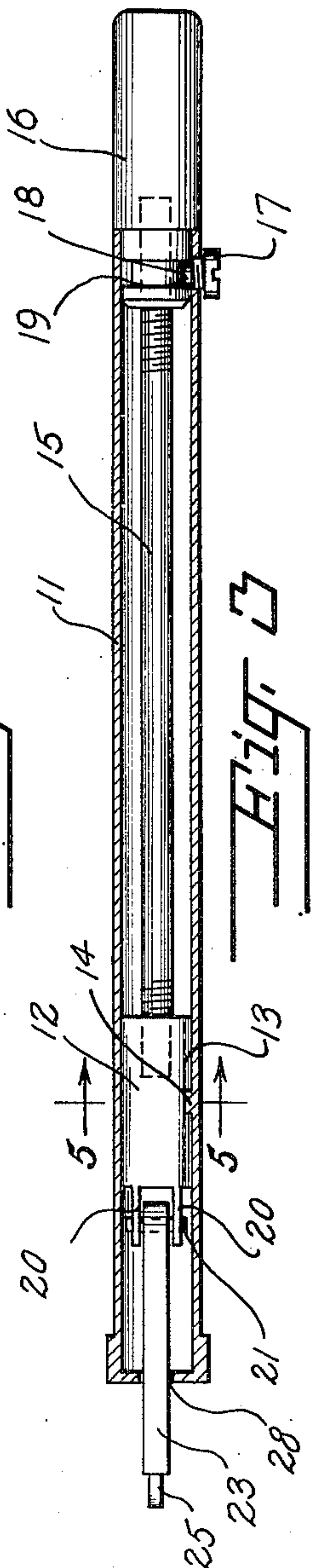


Fig. 3

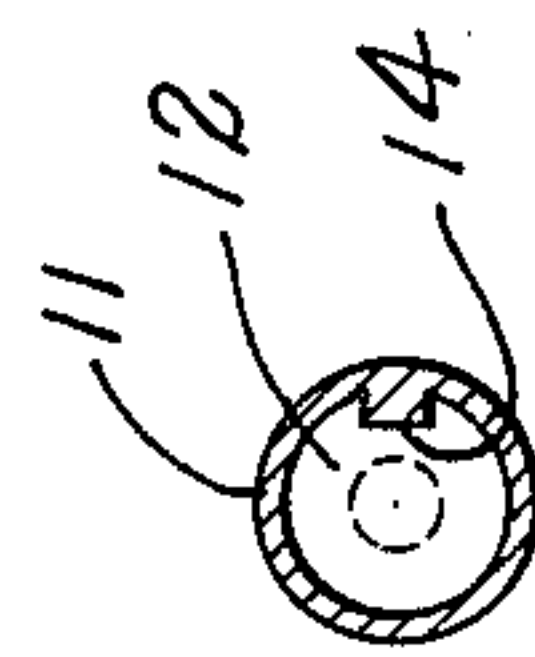


Fig. 4

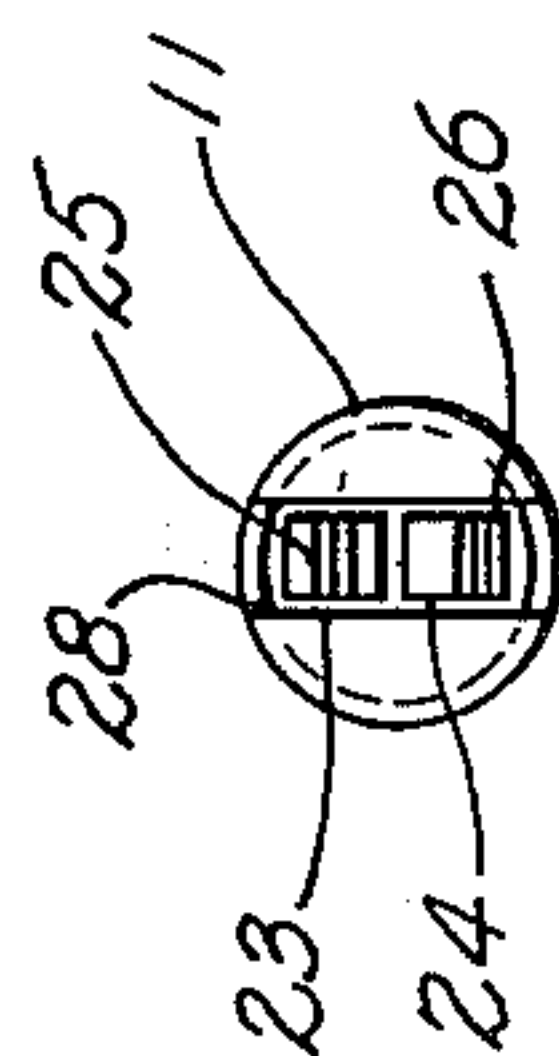


Fig. 5

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## UNITED STATES PATENT OFFICE

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## AXLE STUB-REMOVING TOOL

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2 Claims. (Cl. 294—100)

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This invention relates to gripping tools, and more particularly to a tool for removing broken axle stubs from automotive vehicles.

A main object of the invention is to provide a novel and improved axle-gripping tool which is very simple in construction, easy to use and reliable in performance.

A further object of the invention is to provide an improved axle-gripping tool which is inexpensive to manufacture, sturdy in construction and which may be effectively employed by a relatively unskilled operator.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is an elevational view of an axle stub-removing tool constructed in accordance with the present invention.

Figure 2 is a vertical longitudinal cross-sectional view taken through the tool of Figure 1.

Figure 3 is a horizontal longitudinal cross-sectional view taken through the tool of Figure 1.

Figure 4 is an end view of the tool of Figure 1.

Figure 5 is a transverse cross-sectional view taken on line 5—5 of Figure 3.

Referring to the drawings, 11 designates an elongated tubular housing of suitable material such as pipe stock. Slidably positioned inside housing 11 is a generally cylindrical block or plunger member 12 formed with a longitudinal keyway 13 which slidably engages a lug or key 14 projecting from the inner wall surface of housing 11. Threadedly engaging the rear end portion of plunger 12 is a rod member 15 extending rearwardly in housing 11 and secured to a handle member 16 rotatably mounted in the rear portion of said housing. Secured in the rear portion of the housing is a pilot screw 17 having an inwardly projecting end 18 which is engaged in an annular groove 19 formed in the shank of handle member 16 for restraining said handle member against longitudinal movement with respect to the housing.

Plunger member 12 carries at its forward end a pair of parallel lugs 20, 20 and pivotally secured to the lugs by respective transverse pins 21 and 22 are a pair of forwardly projecting jaw members 23 and 24 projecting through a diametrical slot 28 in the end wall of housing 11 and formed with respective serrated gripping fingers 25 and 26. Positioned in opposed recesses formed in the jaw members is a biasing spring 27 which urges the jaw members apart.

When handle member 16 is rotated in one direc-

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tion, plunger member 12 is moved rearwardly in housing 11, causing the gripping fingers 25 and 26 to be moved closer together, and when the handle member 16 is rotated in the opposite direction, the plunger member 12 is moved forwardly, whereby spring 27 urges the gripping fingers apart.

In operation, the tool is inserted into the axle housing and the gripping fingers 25 and 26 are engaged in diametrically opposite spline grooves in the broken axle stub. Handle member 16 is then rotated to move plunger member 12 rearwardly, and thus tighten the gripping engagement of fingers 25 and 26 with the axle. The axle may then be pulled out of the axle housing. To release the broken stub after it has been withdrawn from the axle housing, handle member 16 is rotated in the opposite direction.

The tool may be taken apart by unscrewing pilot screw 17, thus allowing the inner parts to be withdrawn from housing 11.

The outer diameter of housing 11 is made less than the maximum outside diameter of an axle so that the tool may be readily inserted in the axle housing. By employing a suitable outer diameter of housing 11, the tool may be employed with a wide range of axle sizes, since handle member 16 may be rotated to adjust the distance between gripping fingers 25 and 26 in accordance with the groove diameter of the axle stub which is to be removed.

While a specific embodiment of an axle stub-gripping tool has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention other than as defined by the scope of the appended claims.

What is claimed is:

1. Gripping mechanism for extracting axle stubs from axle housings comprising a tubular casing having an end wall and a diametrical slot in the end wall, a rod member mounted in said casing for movement forwardly and backwardly, a plunger slidable within said casing and having one end secured to one end of said rod member, a pair of lugs arranged in parallel spaced relation projecting from and fixedly carried by the other end of said plunger, means for preventing rotation of the plunger within the casing and arranged to maintain said lugs parallel to said diametrical slot as the plunger moves slidably within the casing, a pair of jaw members arranged in face-to-face relationship with respect



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to each other projecting from the end wall of said casing slidably through the diametrical slot inter-fittingly therewith and pivotally mounted on and disposed between said lugs for movement toward and away from each other, and spring means mounted in the confronting faces of said jaw members and spaced from the pivotal mounting of the latter for biasing the jaw members away from each other.

2. Gripping mechanism for extracting axle stubs from axle housings comprising a tubular casing having an end wall and a diametrical slot in the end wall, a rod member mounted in said casing for movement forwardly and backwardly, a plunger slidable within said casing and having one end secured to one end of said rod member, a pair of lugs arranged in parallel spaced relation projecting from and fixedly carried by the other end of said plunger, said plunger being formed with a longitudinal groove, a lug carried by the inner wall surface of the casing slidably engaging in said groove and so positioned on the wall surface to arrange said lugs in parallel relation with respect to said diametrical slot, a pair of jaw members arranged in face-to-face relationship

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with respect to each other projecting from the end wall of said casing slidably through the diametrical slot interfittingly therewith and pivotally mounted on and disposed between said lugs for movement toward and away from each other, there being opposed recesses in the confronting faces of said jaw members and spaced from the pivotal mounting of the latter, and spring means mounted in said recesses for biasing the jaw members away from each other.

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