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N. BERGLUND ET AL

2,628,521

PLIER-WRENCH

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FIG. 1

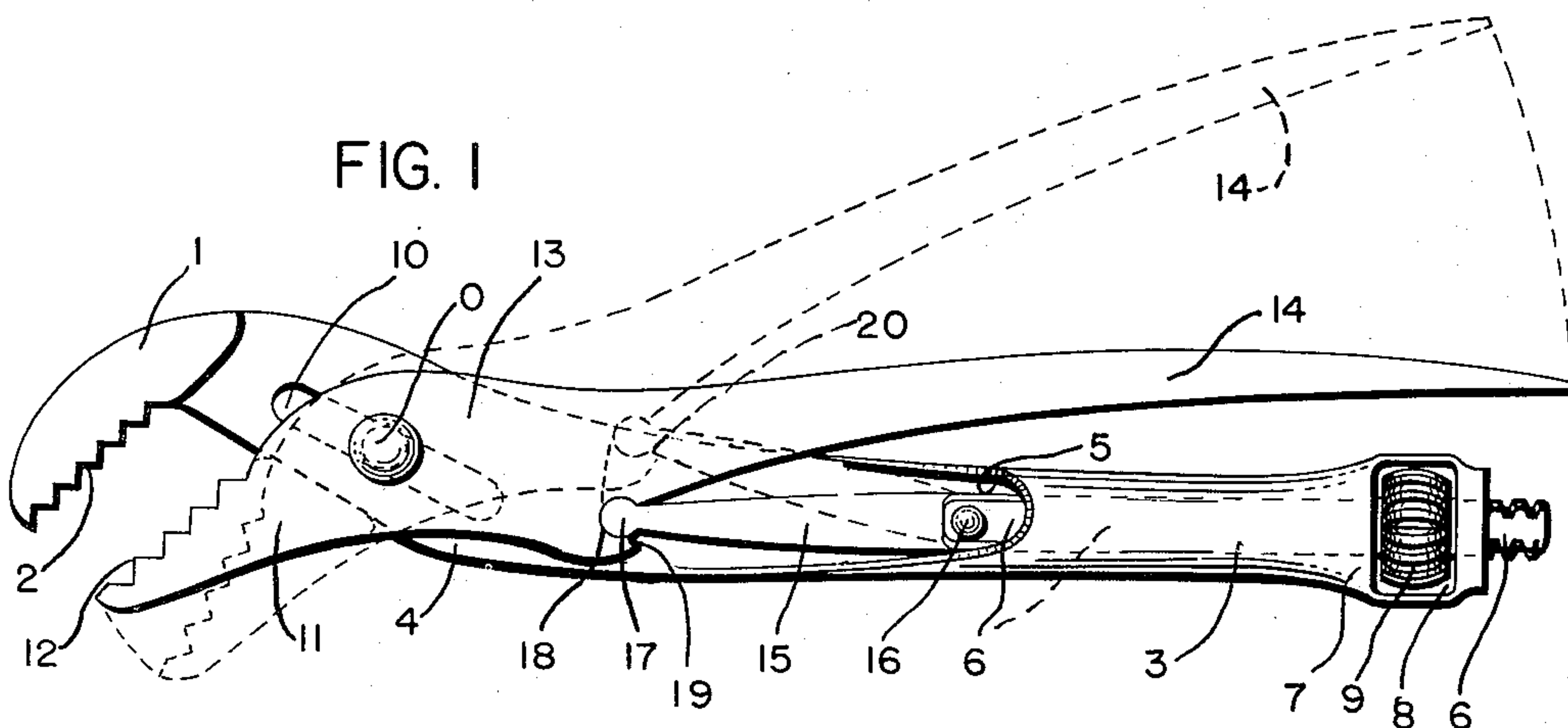


FIG. 2

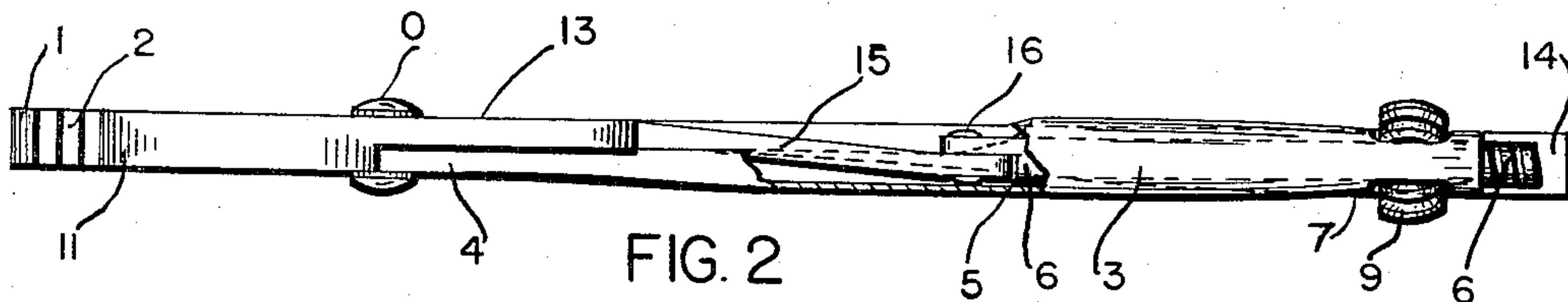
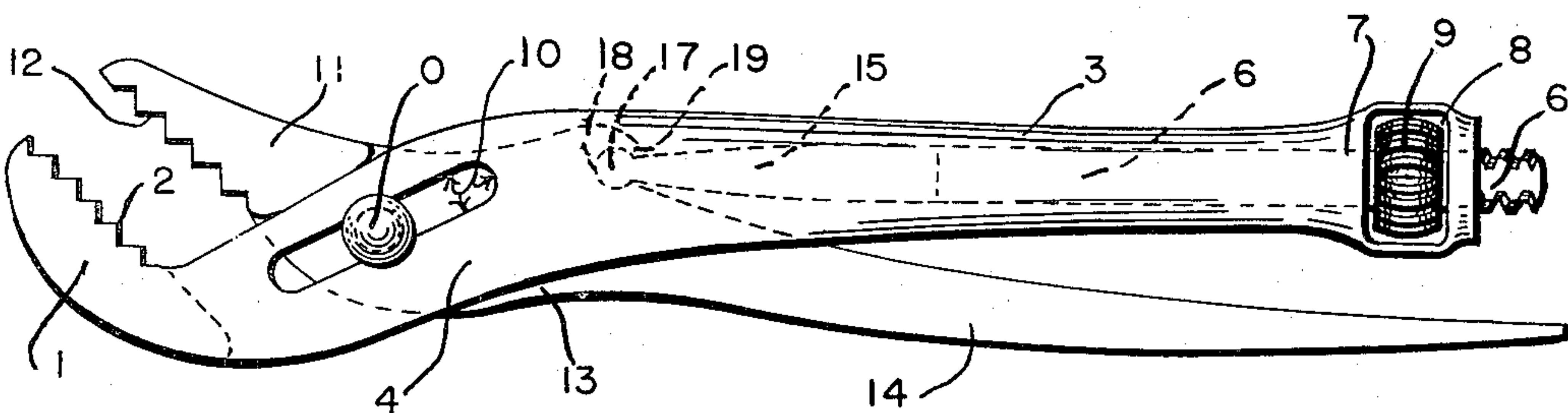


FIG. 3



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## UNITED STATES PATENT OFFICE

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## PLIER-WRENCH

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3 Claims. (Cl. 81—83)

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This invention relates to wrenches and has special reference to wrenches of the plier type.

One of the principal objects of the instant invention is to provide a wrench which gives a firm positive grip on a workpiece without the need for excessive hand pressure.

Another object is to provide such a wrench of the plier type which is adjustable so that a wide size range of workpieces may be handled efficiently with the wrench.

Another object is to provide such a wrench with as few parts as possible, and one which can be manufactured and sold inexpensively.

A further object is to provide an adjustable plier wrench wherein the working faces of the jaws remain substantially parallel irrespective of the spaced relationship of the jaws.

A further object is to provide an off-center locking arrangement whereby, once a grip is obtained on a workpiece, it will not be necessary to apply excessive pressure to maintain the grip on the workpiece.

These and other objects and advantages will become more apparent as the description of the invention proceeds.

In the accompanying drawing forming a part of this application:

Fig. 1 is a side elevational view of an adjustable plier-wrench embodying the invention.

Fig. 2 is an edge view of the device shown in Fig. 1.

Fig. 3 is a side elevational view of the opposite side of the device shown in Fig. 1.

In the drawing the reference numeral 1 indicates the fixed jaw of the wrench or plier, and 2 indicates the working face thereof which may be provided with teeth as shown for gripping a workpiece. The numeral 3 indicates the stationary handle portion of the wrench which is preferably integral with the jaw 1, being joined thereto by means of the fulcrum portion 4. The handle 3 is hollow, as at 5, to reciprocally receive an adjusting screw 6. The rear end of the handle 3 is flattened or spread slightly as at 7 to permit an opening 8 to be formed therethrough, an adjusting nut 9 being carried in the opening, and being threaded on the screw 6 so that the latter may be reciprocated in the hollow handle 3 by rotating the nut 9 in one direction or the other.

An elongated slot 10 is provided in the fulcrum portion 4 of the stationary member of the wrench, the slot preferably being disposed at an obtuse angle to the working face of the fixed jaw 1.

A movable jaw 11 is provided, having a working face 12 which is normally substantially par-

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allel with the working face 2 of the jaw 1 when the wrench is in operation. The movable jaw has an integral fulcrum portion 13 and handle 14, an opening (not shown) being provided through the fulcrum portion, whereby a rivet 0 may be installed through the latter said opening and the slot 10 to secure the movable and fixed parts of the plier or wrench together in slidable, pivotal relationship.

The fulcrum portions 4 and 13 are of reduced thickness to that of their respective jaws 1 and 11, the jaws extending laterally on opposite sides of their respective fulcrum portions so that the working faces of the jaws will meet in aligned relationship, as shown.

To complete the wrench, a link arm 15 is provided between the adjusting screw 6 and the movable member of the wrench. The link arm is pivotally secured to the inner end of the screw 6 as by a rivet 16. The opposite end of the arm 15 has a substantially cylindrical enlargement or head 17 thereon which is carried in a similarly shaped opening or indenture 18 formed in the edge of the fulcrum portion 13 directly opposite the screw 6, as shown, the fulcrum portion being slightly extended or enlarged for the purpose, thus, the arm 15 is pivotally carried by the screw 6 and by the fulcrum portion 13 of the movable member of the wrench.

It will readily be seen, from the above, that the spacing of the working faces 2 and 12 from each other may readily be adjusted by rotating the nut 9 to reciprocate the screw 6. The link arm 15 will move the movable member 11—13—14 when the screw 6 is reciprocated, the rivet 0 sliding freely in the slot 10, obviously, to change the relationship of the working faces. When the spacing of the jaws is changed, their substantially parallel relationship is not effected until the handle 14 is moved away from the handle 3 as shown in dotted lines in Fig. 1. This moves the jaw 11 away from the jaw 1 enough so that they may be engaged on a workpiece.

When the jaws are in this open position, it is to be noted that the end 17 of the link arm is carried with the fulcrum portion 13, it being pivotally carried in the socket 18, and is on the outside of a line running from the pin or rivet 16 to the pin or rivet 0. However, when the handle 14 is moved to its normal gripping position as shown in full lines, Fig. 1, the end 17 of the arm is on the opposite side of the said line between the rivets 16 and 0. This feature puts the link arm in an off center relationship with the jaw fulcrum 0 which locks the jaws on the



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workpiece and prevents the transmission of opening stresses from the jaws through to the handles. This eliminates the need for applying an excessively strong hand grip to keep the handles 3 and 14 from spreading and releasing the workpiece from the jaws. The jaws are easily opened when desired, however, by manually moving the handles 3 and 14 apart.

In adjusting the plier-wrench to a particular workpiece, the adjustment should be made so that the head 17 of the link arm moves into its desired off-set relationship to the jaw fulcrum rivet 0 to provide the desired locking feature and eliminate the need for excessive gripping stress on the handles as is the case with ordinary pliers.

A stop 19 is provided on the fulcrum portion 13 adjacent the socket 18 to engage the link arm 15, as shown in dotted lines at 20, to limit the distance the handles 3 and 14 may be spread apart.

With the instant plier-wrench leverage and workpiece grip is provided without the need for excessive strength on the part of the operator.

Having thus described our invention, what we claim is:

1. In a plier-wrench a pair of one-piece members, each of said members having a rigid jaw extending therefrom, a fulcrum portion rearwardly of said jaws, and a handle, said members being pivotally united at their fulcrum portions, one of said members having an elongated slot through its fulcrum portion forming a part of said pivotal union and a screw reciprocally carried by its handle; the other said member having

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a socket in its fulcrum portion; and a link arm pivotally carried in said socket at one end and pivotally connected to said screw at its opposite end whereby the reciprocation of said screw will change the spacing of said jaws relative to each other.

2. The structure as set forth in claim 1 and said link arm and socket being so arranged that when said handles are adjacent each other in normally operative position said link arm is in off-center locked relationship with said pivotal union whereby stresses on said jaws will not spread said handles apart.

3. The structure as set forth in claim 1 and a stop adjacent said socket to limit the distance said handles may be spaced apart.

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