

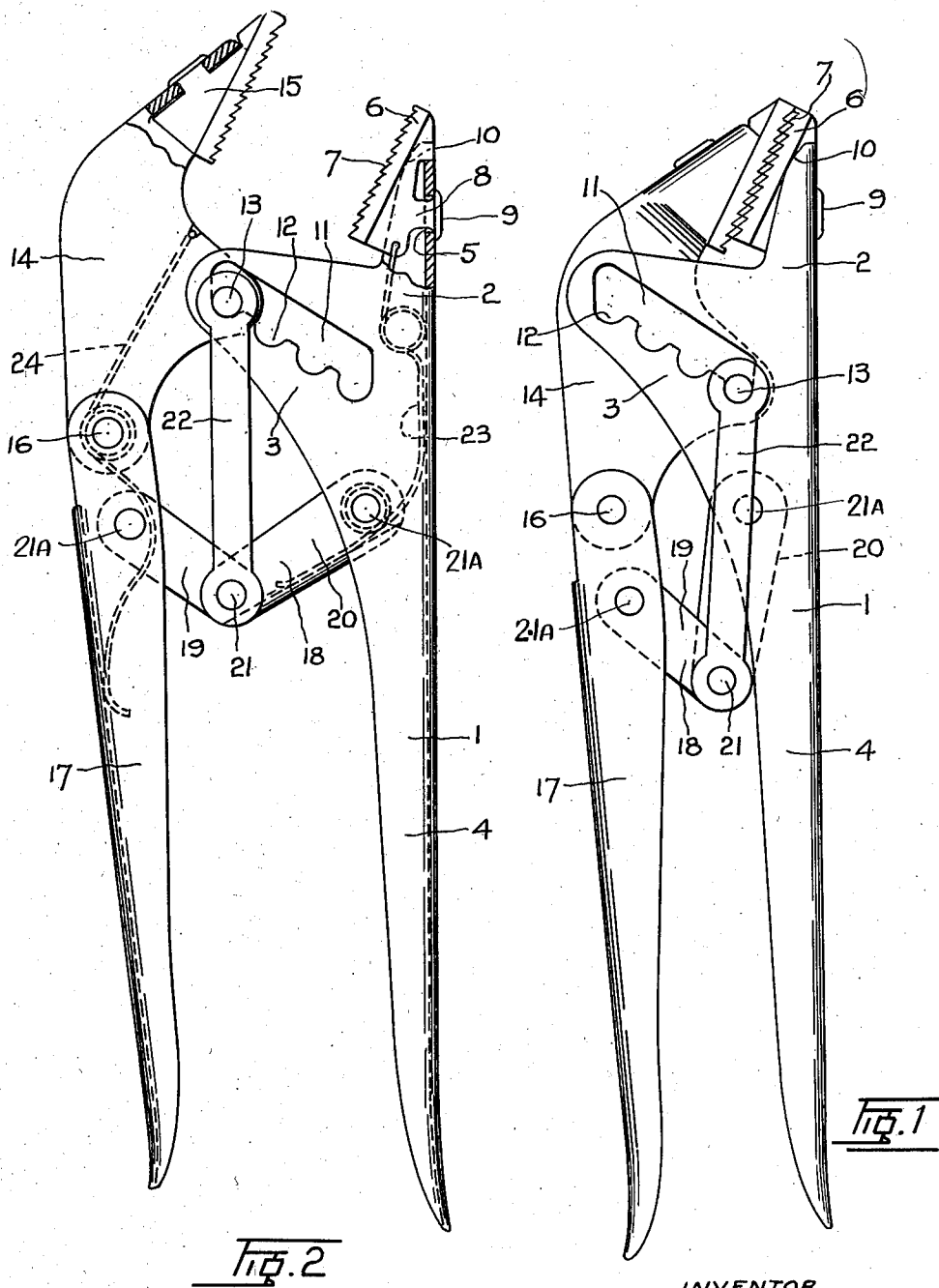
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PLIERS

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2,066,716

PLIERS

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3 Claims. (Cl. 81-44)

My invention relates to improvements in pliers. The objects of the invention are to provide a plier in which a progressive increase in gripping purchase is obtained as the handles are drawn towards each other, whereby nuts and bolts may be easily gripped and turned; to provide means whereby adjustable spacing of the jaws may be effected by a slight thumb pressure while holding both handles in one hand; to provide a self-aligning jaw which is not dependent on a pin for a fulcrum, and to provide an easy spring opening of the plier.

The invention consists essentially of a pair of pliers having an adjustable fulcrum, said pliers having one jaw integral with a handle and another jaw operated from a second handle by a compounded leverage, and a link connecting the main fulcrum of the compound leverage to the adjustable fulcrum whereby pressure applied to the handles serves to prevent movement of the adjustable fulcrum, as will be more fully described in the following specification and shown in the accompanying drawing, in which:—

Fig. 1 is a general view of the pliers adjusted for gripping small articles.

Fig. 2 is a general view, partly fractionated, of the pliers adjusted for gripping large articles such as valve hoods, large nuts etc.

In the drawing like characters of reference indicate corresponding parts in each figure.

The numeral 1 indicates generally a member made up preferably of pressed sheet steel folded longitudinally to form a substantially T-shaped member having its upper portion serving as a jaw 2, its intermediate portion forming a bearing 3 and its lower portion a handle 4.

The jaw portion 2 of the member 1 is slotted as at 5 and is fitted with a jaw insert 6 consisting of a strip of T steel having its base serrated as at 7 to provide a gripping surface and its web cut away as at 8 to form a tongue which is riveted over at its free end as at 9 to loosely yet securely hold the jaw insert in the folded upper jaw portion 2 that it may rock and adjust its position about the curved inner face 10 of the fold. The bearing 3 consists of a diagonal slot 11, the lower margin of which is corrugated to define a plurality of semi-circular notches 12. Pivotaly engaging any of the notches 12 is a fulcrum pin 13 which passes through a second jaw member 14 which too is preferably made of sheet metal folded upon itself in the same manner as the member 1, this member supports at its upper end a jaw insert 15 similar to that previously described, except that it is immovably

secured in position between the folds of the metal. The lower end of the member 14 is pivotally connected by a pin 16 to a second handle 17 also of U-shaped section.

The handles 4 and 17 are connected together by a toggle 18 consisting of two links 19 and 20 connected together at their inner ends by a pin 21, and connected at their outer ends to the handles 4 and 17 by pins 21A. The links 19 and 20 are angularly disposed to each other at all times and the apex of the angle so formed is towards the free ends of the handles 4 and 17. The pin 21 connecting the links together also forms a connection with a link 22, which link is connected at its upper end by the fulcrum pin 13 about which the member 1 and the second jaw member 14 swing.

A wire spring 23, shown in dotted line in Figure 2, is suitably inserted into the member 1 and passed around the pin 21A of the handle 4 to urge the lower end of the jaw insert 6 inwardly and to urge the inner end of the link 20 downwardly, so that the pin 13 is held firmly within the selected notch 12 and the pin 21 is retained at a predetermined spacing from the handle 4. A further spring 24, likewise shown in dotted line in Figure 2 is wound around the pin 16 and is so arranged as to urge the free ends of the jaw member 14 and the handle 17 outwardly. The springs urge the handles and the jaws apart and the spring 23 through its downward pressure upon the link 20 also urges the link 22 downwardly, so that the fulcrum pin 13 is held in position within its notch 12 while in normal use.

When the jaws are set about a nut or other device to be gripped and the handles are squeezed together the jaws close into position upon the nut. It will be observed that the angle between the link 20 and the link 22 will remain constant when set in any position due to the pin 13 being engaged in one of the notches 12, but that the link 19 will in its tendency to close inwardly towards the link 22 exert a thrust upwardly and outwardly through the upper part of the handle 17 to the pin 16, thus compounding the leverage of the handle 17, so that with a relatively slight pressure upon the handle great force will be applied to the nut.

When it is desired to adjust the spacing between the jaws, a slight upward thrust being applied under the toggle 18 will release the pin 13 from engagement with its notch 12 when movement of the handles will bring the desired notch into register with said pin. This adjustment can

be conveniently made by the hand supporting the pliers.

What I claim as my invention is:

1. A pair of pliers comprising a jaw member
5 having an integral handle, a second jaw member
pivotaly connected to the first, a handle connected
by a pivot pin to the second jaw member
and connected by a toggle to the handle of the
10 first jaw member, the pivotal connection between
the first jaw member and the second jaw member
consisting of a slotted member having a plurality
of notches in which the pin is selectively
engageable and a link connecting said pin intermediate
15 the length of the toggle.
2. A pair of pliers comprising a jaw member
having a jaw at one end, a handle at the opposite
end, and a lateral projection intermediate its
length, said lateral projection having a slot
with a plurality of notches along one side, a second
20 jaw member having a pivot pin adapted to
selectively engage the notches, a second handle

pivotaly connected to the second jaw member,
a toggle connected at its outer ends to the
handles and a link connecting the pivot pin intermediate
the ends of the toggle, said toggle being
5 so disposed that its apex is directed towards
the free ends of the handles.

3. A pair of pliers comprising a jaw member
having an integral handle, a second jaw member
pivotaly connected to the first, a handle connected
by a pivot pin to the second jaw member
10 and connected by a toggle to the handle of the
first jaw member, the pivotal connection between
the first jaw member and the second jaw member
consisting of a slotted member having a plurality
of notches in which the pin is selectively engage-
15 able and a link connecting said pin intermediate
the length of the toggle, and spring means for
urging the handles apart and to impart a strain
upon the link whereby the pivot pin is retained
in its selected notch. 20

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