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CHAIN LINK COMPRESSING PLIERS

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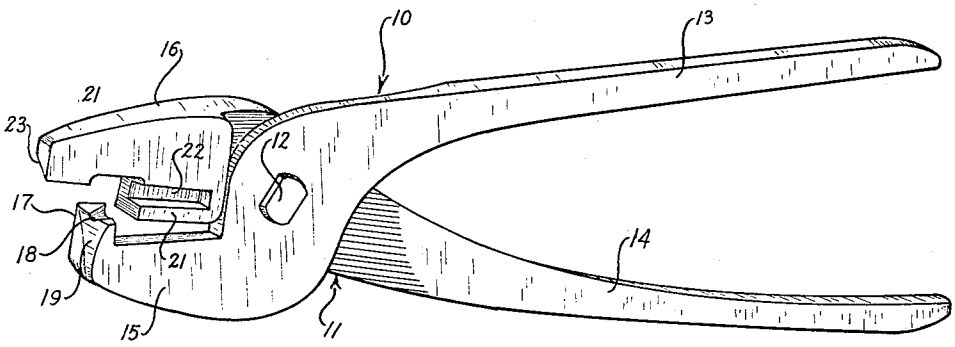


FIG.—1

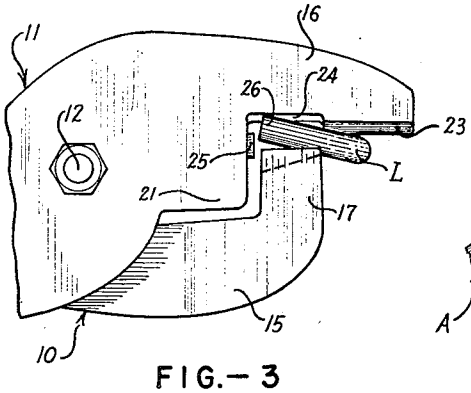


FIG.—3

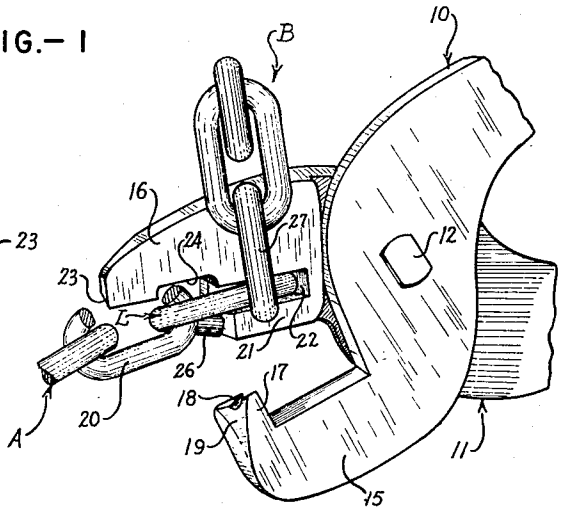


FIG.—2

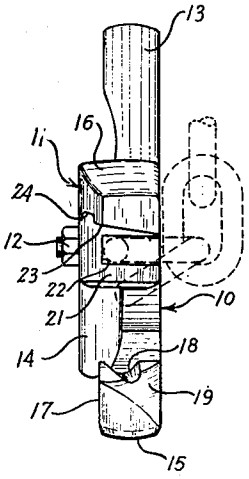


FIG.—4

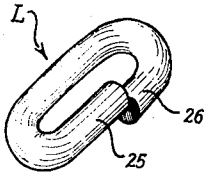


FIG.—6

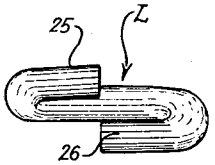


FIG.—5

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CHAIN LINK COMPRESSING PLIERS

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4 Claims. (Cl. 81—15)

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This invention relates to a tool and more particularly to pliers for replacing a broken link in a chain.

One of the objects of our invention is to provide a tool capable of aligning laterally spaced ends of a chain link.

Another object is to provide improved pliers whereby an "open" link may be quickly and easily placed in "closed" position for connecting together sections of a broken chain or the ends of two chains.

Yet another object is to so construct the jaws of pliers that a chain link having laterally spaced ends can be firmly held thereby and the ends deformed so as to be placed in aligned position.

A further object is to so design the jaws of the type of pliers referred to that when operated to align the end of a link, said ends will be so deformed that there will be compensation for "spring back."

Other objects of our invention will become apparent from the following description taken in connection with the accompanying drawing in which:

Figure 1 is a perspective view of pliers shown, by way of example, as a tool embodying the invention;

Figure 2 is a view of the jaws of the pliers in open position with a link positioned therein and ready for closing;

Figure 3 is a side of the jaws showing the positions assumed when a link is deformed to closed condition;

Figure 4 is a front end view of the pliers; and

Figures 5 and 6 are two different views showing the link which is to be closed by the pliers.

The improved pliers, as shown, comprise two crossed members 10 and 11 pivoted together at the crossed point by a pivot pin 12. The portions of the members 10 and 11, rearwardly of the pivot, form handles 13 and 14, respectively. The forward portion of member 10 is formed to provide a special jaw 15 and the forward portion of member 11 is formed to provide a special jaw 16.

The jaw 15 is shorter than the jaw 16 and is provided at its outer end with an inwardly extending projection 17, at the inner end surface of which is a groove 18 extending in the longitudinal direction of the jaw. The inner end of this groove is deeper and wider than the outer end as is best seen in Figures 1 and 4. One outer corner of the projection 17 is beveled in the manner shown at 19, the purpose of which is to prevent the projection from interfering with a chain link to which a connecting link is to be

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attached by the pliers as, for example, the link 20 shown in Figure 2. Also, by means of this beveled corner, the projection 17 will be able to apply the proper force to an end only of a link. There will be no engagement of the projection with the unbroken side of the link. The making of the inner end of the groove 18 deeper and wider than the outer end is to permit better reception in the groove of an open end of the particular type of "open" link which is to be closed by the pliers.

The other longer jaw 16 is formed adjacent the pivot with a portion 21 extending toward the jaw 15 and this portion has a slot 22 open to the left side of the jaw when looking at the pliers when held in the right hand and positioned as shown in Figure 1. This slot is open at the side of the jaw and at its forward end. The portion 21 containing the slot is of such length as to permit the projection 17 and jaw 15 to move in front thereof when the two jaws are closed. The outer end portion of jaw 16, which extends beyond projection 17 of jaw 15 when the jaws are closed, is provided with an inner beveled surface as shown at 23. That part of jaw 16 which is between the beveled surface 23 and portion 22 having the slot is formed to provide a depression or recess 24. The purpose of the beveled surface and the depression is to permit the link to be operated on to be properly "closed" by compensating for "spring back" of the ends of the link as will become later apparent.

The link to be operated on by the pliers is shown in Figures 5 and 6 and indicated by the letter L. The link is made of tempered steel and is in the form of a loop with its leg ends 25 and 26 arranged to be laterally spaced apart such a distance that other endless links can be passed between the ends. This "open" condition of the link thus permits the ends when deformed laterally toward each other and brought in aligned positions to be in substantially abutting relation.

To place the link L, shown in Figures 5 and 6, in a chain to replace a broken link or to employ it to connect ends of two chains together, the operation can be quickly and easily performed by the improved pliers described. First, the link L is hooked into the end link 20 of a chain section A (shown in Figure 2), and also hooked into the end link 27 of another chain section B which is desired to be connected to section A. The link L is then placed in the open jaws of the pliers in the manner shown in Figure 2. It is to be noted that in placing the link L in the jaws of the

pliers the end 25 will be placed in the slot 22. This will leave the other end 26 positioned below the open end of the slot, as viewed in Figure 2, and abutting or substantially abutting the outer end of the portion 22.

To close the link L, all that now needs to be done is to bring the handles of the pliers together, thus moving the jaws together. As the jaw 15 moves toward jaw 16 the end 26 of link L will first be received in groove 18 in the inner end surface of projection 17. The surface of the groove will fully engage the surface of the angularly positioned end 26 due to said groove being deeper and wider at its inner end. As the jaws continue to be moved toward each other, the projections 17 will act on end 26 while the link is held in the slot 22 of jaw 16 and thus bend the end 26. During bending, the outer portion of the link away from the slot will abut against the outer end of jaw 16 and prevent bending of the unbroken side of the link opposite the ends. When the jaws are fully closed, end 26 will be bent past alignment with end 25 as shown in Figure 3. This is permitted by the depression 24 in jaw 16 and the beveled surface 23. The extent to which end 26 can be bent beyond alignment with end 25 will be determined by the depth of depression 24. The purpose in permitting the jaws to bend the ends of link L past alignment is to compensate for "spring back" in the steel of the link. When the jaws are spread apart the "spring back" will take place and the ends 25 and 26 will then be in alignment and the link L properly closed. Since the link L is made of tempered steel, the unbroken side of the link will carry the load and the ends will not be easily pulled apart and will thus make a strong connection between the chain sections. However, if desired and convenient, the ends 25 and 26 could be welded together.

The pliers are particularly useful in replacing broken links in automobile or truck tire chains. The repairing of cross chains can be done in an easy and quick manner without removing the chains from the tires. The pliers and open links L can be conveniently carried in the vehicle. Of course the pliers are also useful in joining any kind of chain sections together, either in the manner of repair or for lengthening existing chains. The pliers can be made of different sizes to operate on different size links.

Being aware of the possibility of modification in the particular pliers shown and described without departing from the fundamental principles of our invention, it is to be understood that the scope of the invention is not to be limited in any manner except in accordance with the appended claims.

What is claimed is:

1. In a tool for closing a looped link or like member having laterally spaced ends pointing in opposite directions, said tool comprising jaw members, and means for moving the jaw members toward each other, one of said jaw members having a link supporting block on its inner face near the inner end of the jaw member with said block extending toward the other jaw and having an elongated slot therein opening toward the outer end of the block and being open sided but only at one side of the block so as to receive one of the laterally spaced ends only of the link therein, the other of said jaw members having a projecting end portion on its inner face extending toward the said first jaw and inwardly thereof being formed to receive the block so that the projecting end portion will pass the outer end of the block when the jaws are closed, said projecting portion arranged to act on the other spaced end of the link so that as the jaw members are closed it can bend said other end into alignment with the end in the block.

2. In a tool for closing a looped link or like member having a laterally spaced ends pointing in opposite directions, said tool comprising jaw members, and means for moving the jaw members toward each other, one of said jaw members having a link supporting block on its inner face near the inner end of the jaw member with said block extending toward the other jaw and having an elongated slot therein opening toward the outer end of the block and being open sided but only at one side of the block so as to receive one of the laterally spaced ends only of the link therein, the other of said jaw members having a projecting end portion on its inner face extending toward the said first jaw and inwardly thereof being formed to receive the block so that the projecting end portion will pass the outer end of the block when the jaws are closed, said projecting portion arranged to act on the other spaced end of the link so that as the jaw members are closed it can bend said other end into alignment with the end in the block, said first mentioned jaw member outwardly of the block and beyond the projecting portion on the said other jaw having a projecting portion formed to engage the link outwardly of that end which is acted on and bent by the action of said projection which is on the other jaw member.

3. In a tool for closing a looped link or like member having laterally spaced ends pointing in opposite directions, said tool comprising jaw members, and means for moving the jaw members toward each other, one of said jaw members having a link supporting block on its inner face near the inner end of the jaw member with said block extending toward the other jaw and having an elongated slot therein opening toward the outer end of the block and being open sided but only at one side of the block so as to receive one of the laterally spaced ends only of the link therein, the other of said jaw members having a projecting end portion on its inner face extending toward the said first jaw and inwardly thereof being formed to receive the block so that the projecting end portion will pass the outer end of the block when the jaws are closed, said projecting end portion arranged to act on the other spaced end of the link so that as the jaw members are closed it can move said other end into and beyond alignment with the end in the block, said first mentioned jaw member outwardly of the block being formed with a recess of a depth to predetermine the extent of moving of the said other end of the link beyond alignment.

4. In a tool for closing a looped link or like member having laterally spaced ends pointing in opposite directions, said tool comprising jaw members, and means for moving the jaw members toward each other, one of said jaw members having a link supporting block on its inner face near the inner end of the jaw member with said block extending toward the other jaw and having an elongated slot therein opening toward the outer end of the block and being open sided but only at one side of the block so as to receive one of the laterally spaced ends only of the link therein, the other of said jaw members having a projecting end portion on its inner face ex-

tending toward the said first jaw and inwardly thereof being formed to receive the block so that the projecting end portion will pass the outer end of the block when the jaws are closed, said projection having a notch in its inner end to receive the other spaced end of the link so that as the jaw members are closed it can bend said other end into alignment with the end in the block, said first mentioned jaw outwardly of the block and beyond the projecting portion on the said other jaw having an inwardly projecting portion for engaging the link outwardly of the end which is acted on and bent by the projection which is on the said other jaw member, said last named projecting portion having a beveled end surface edge on the side opposite that of the open sided slot.

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