Dec. 4, 1956 E. R. WOODRING ET AL 2,772,587

TOOL SET FOR OPENING AND CLOSING CHAIN LINKS

Filed May 6, 1955

Fig-1

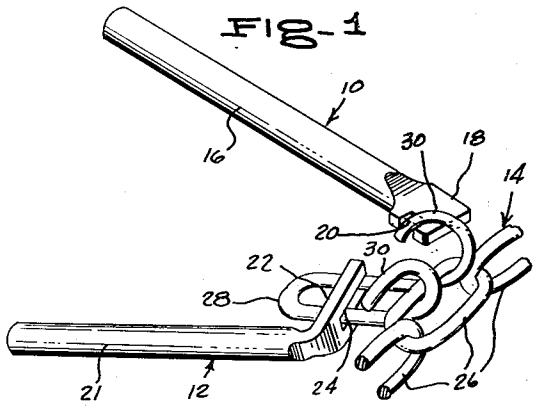


Fig-2

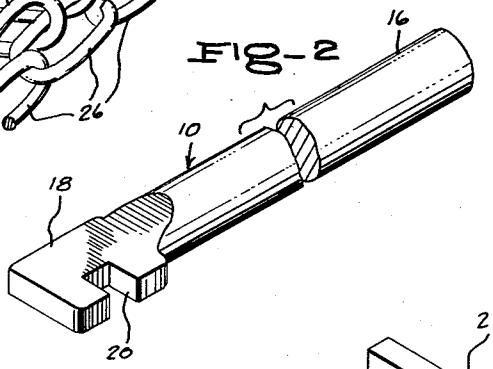


Fig-3

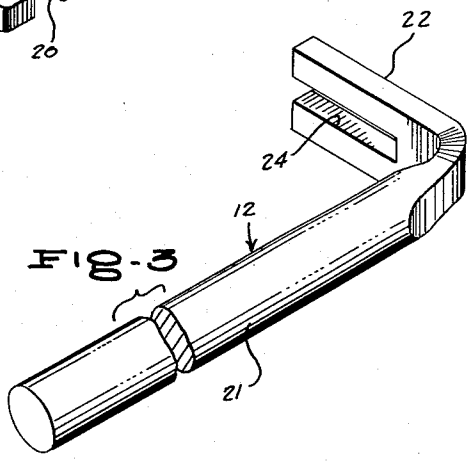
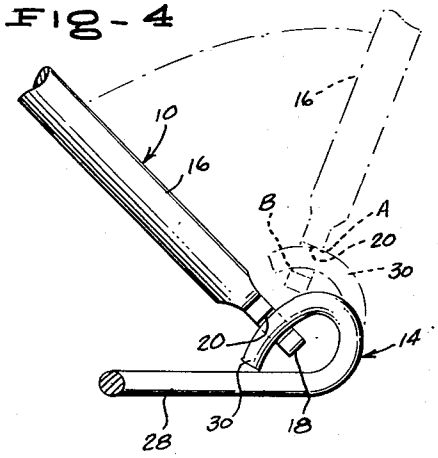


Fig-4



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TOOL SET FOR OPENING AND CLOSING CHAIN LINKS

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1 Claim. (Cl. 81—15)

This invention relates to lever type wrenches, and more particularly has reference to a set of wrenches so designed as to facilitate the attachment or detachment of an end link of a cross chain, in respect to an associated link of a side chain.

The connection or disconnection of an end link is a time-consuming, laborious matter in many instances, due to the inadequacy of the tools presently used for opening and closing said end link. Accordingly, the main object of the present invention is to provide a pair of wrenches usable in combination, in such a manner that one wrench is adapted to grip the end link to hold the same stationary, while the other wrench is adapted to be engageable, in succession, with one and then the other eye portion of the link, to open or close said eye portions, by a lever action exerted counter to the leverage imposed upon the body of the link by the first wrench.

Another object of importance is to provide a wrench set as described which will be capable of manufacture at low cost, will be rugged, and will be particularly adapted for the efficient discharge of its intended functions.

Other objects will appear from the following description, the claim appended thereto, and from the annexed drawing, in which like reference characters designate like parts throughout the several views, and wherein:

Figure 1 is a perspective view showing the wrench set in use on an end link of an associated side chain;

Figure 2 is an enlarged perspective view of one of the wrenches per se, a portion of the handle being broken away;

Figure 3 is a perspective view of the other wrench of the set per se, a portion of the handle being broken away; and

Figure 4 is a side elevational view of the wrench of Figure 2, showing the same in use during the opening of an end link, said end link being shown in longitudinal section.

The reference numerals **10**, **12** generally designate a pair of wrenches, usable together, as a set, in the operation of connecting or disconnecting an end link from a side chain **14**. Normally, the side chain **14** is connected to a cross chain, on the end of which the end link is provided with the end line being attached to a selected length of the side chain.

The wrench **10** includes an elongated, straight handle **16** formed from a suitable length of solid bar stock, one end of said length of stock being flattened to provide a head **18**. The head **18** is of rectangular outer configuration, and is symmetrically disposed in respect to the longitudinal center line of handle **16**, that is, the longitudinal center line of the head **18** is an extension of the longitudinal center line of the handle **16**. The head **18** is thus symmetrically disposed in respect to handle **16**, and lies in a plane through which the center line of the handle passes. The head **18** being of greater width than the diameter of the handle **16**, and being symmetrically disposed in respect to the length of the

handle, has its opposite side edges disposed laterally, outwardly of the adjacent sides of the handle **16**.

Formed in one of the side edges of the head **18**, medially between the opposite ends of the head, is a short slot **20**. The slot **20** extends along a line normal to the length of the handle **16**, and opens upon its associated side edge of the head **18**, the open end of the slot thus necessarily being spaced laterally, outwardly from the adjacent side of the handle **16**.

The wrench **12** includes an elongated handle **21**, also formed from a straight length of cylindrical, solid bar material, and integrally formed upon one end of handle **21** is an elongated, flat head **22**. Head **22** projects laterally in one direction from the associated end of handle **21**, and lies in a plane normal to the longitudinal center line of handle **21**. An elongated slot **24** is formed in the head **22**, medially between the top and bottom edges thereof, and thus extends normally to the length of handle **21**, opening upon the end edge of the head **22** at a location spaced laterally outwardly from the adjacent side of handle **21**. The side chain **14** is composed of a plurality of links **26**, and connected to one of said links is an end line **28** of a cross chain, not shown. The end link **28** is of U-shaped formation, having straight legs extending substantially perpendicularly to the length of the side chain. Said legs, at the ends thereof remote from the bight of the end link, curve upwardly and then downwardly to form loops defining eyes **30**, receiving one side of the associated link **26** of the side chain.

Opening the loops **30** to remove the end link from the side chain has heretofore presented considerable difficulties, and the same difficulties are encountered when the loops **30** are to be closed about the associated link **26**.

To obviate these difficulties, we provided the wrench set, the wrenches being paired and being usable together. The wrench **12** is disposed as shown in Figure 1 to define a link holder, with its slot receiving both legs of the end link **28** at a location spaced longitudinally of the end link from the loops to hold the link against rotation. Then, assuming that the end link is being disconnected from the side chain, the wrench **10** defining a link loop bender is engaged with one of the loops **30**, the free end of said loop being disposed in slot **20**. Then, with wrench **21** held in one hand, the handle **16** is shifted upwardly from the full to the dotted line positions of Figure 4. This causes pressure to be exerted by opposite walls of slot **20** at points A, B against the material of the loop **30**, bending said material upwardly to the dotted line position of Figure 4 to open the eye.

The wrench **12** is now removed, and is disposed at the opposite side of the end link, again receiving the legs of the end link. Wrench **10** is now turned over, to face its slot **20** in the opposite direction, and is engaged with the other loop **30**. The operation is now repeated to open said other loop, and this disconnects the end link from the side chain.

To close an end link about an associated link of a side chain, the operation is performed similarly to that previously described herein, except, of course, that the wrench on link loop bender **10** is now shifted from the dotted to the full line positions of Figure 4, to close the open loop portions **30** about the associated link **26**.

It will be seen that by reason of the arrangement illustrated, the leverage exerted by wrench **10** upon the associated loop portion is exerted directly counter to the force exerted against the body portion of the associated end link held against rotation by the link holder **12**, so that the counteracting levers apply strong pressures on the portions of the end link engaged thereby, to facilitate relative movement of said portions for opening and closing the end link loops, whichever is desired.

It is believed apparent that the invention is not necessarily confined to the specific use or uses thereof described above, since it may be utilized for any purpose to which it may be suited. Nor is the invention to be necessarily limited to the specific construction illustrated and described, since such construction is only intended to be illustrative of the principles, it being considered that the invention comprehends any minor change in construction that may be permitted within the scope of the appended claim.

What is claimed is:

A tool set for connecting and disconnecting a cross chain end link having spaced legs and loops adjacent one end of the link to define eyes through which extends a link of a side chain, said set comprising a link holder including an elongated handle and a head projecting laterally from said handle adjacent one end thereof, said head having an elongated slot extending therethrough and opening through the end thereof remote from said handle, said slot being adapted to receive the legs of the cross chain end link to hold the link against rotation; and a link loop bender including an elongated handle, a flat head carried by said handle and extending longitudinally outwardly therefrom adjacent one end thereof, said tool head having a loop receiving slot opening through one side thereof to define spaced loop engaging side walls to receive a loop therebetween and bend the loop to open or close the loop about a side chain link.

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