Aug. 14, 1945. J. W. GEDDES ET AL 2,382,307

MULTIPLE LEVER TOOL

Filed Aug. 15, 1944

Fig. 1

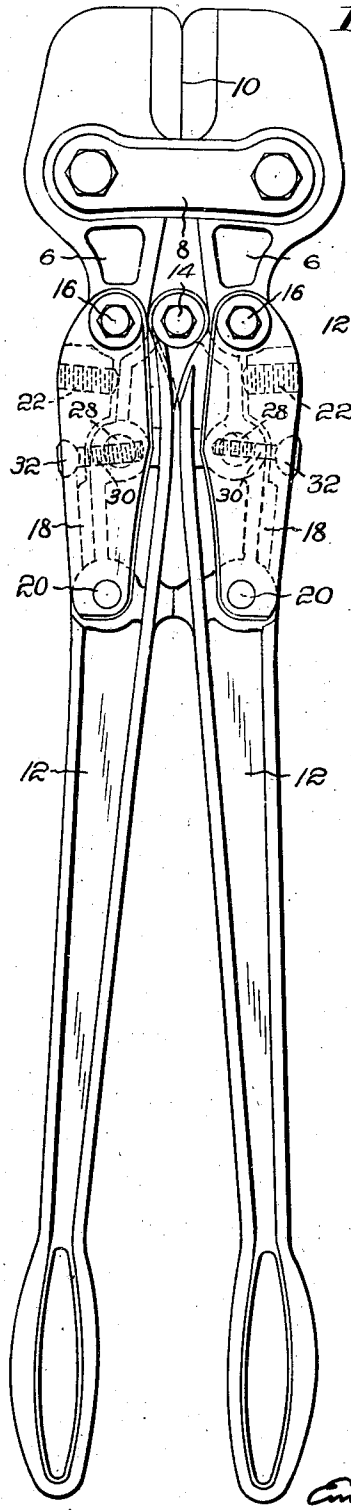


Fig. 3.

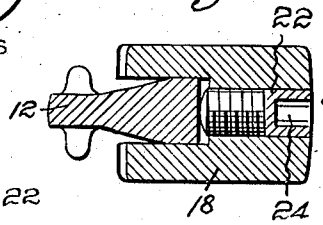


Fig. 4.

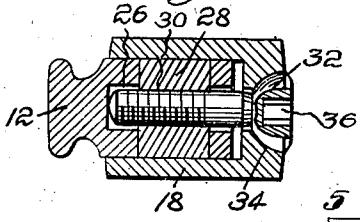


Fig. 5.

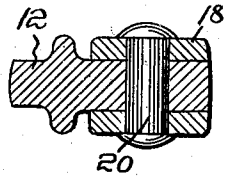
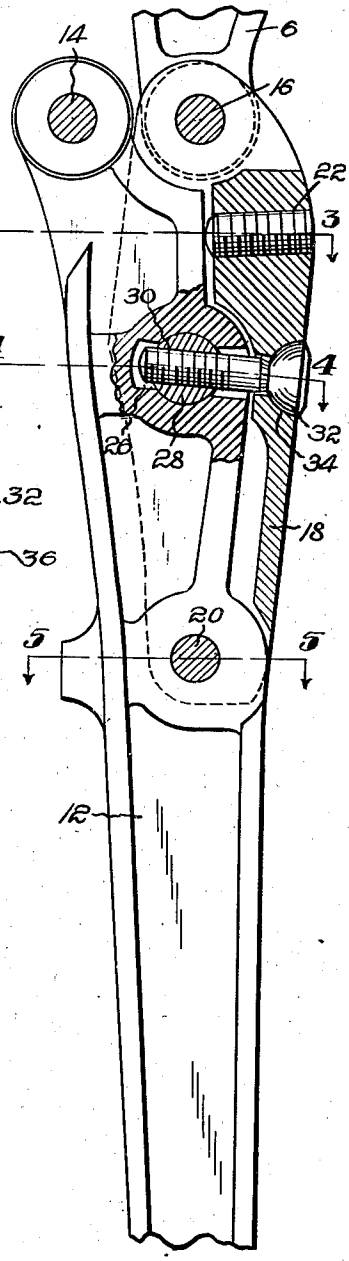


Fig. 2.



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MULTIPLE LEVER TOOL

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Application August 15, 1944, Serial No. 549,593

4 Claims. (Cl. 30—193)

This invention relates to compound-lever tools of which the tool commonly known as a bolt clipper is a well known example, and the object is to provide an improved construction whereby the relative position of the pivotal centers may be adjusted as is necessary, for example, in a bolt clipper or like cutting tool when the edges are resharpened and would thereafter fail to meet unless suitable adjustment were made. The object of the invention is to provide within the existing dimensional limitations a simple, strong, readily manipulated construction and one which will be free from objectionable protrusion, whereby the tool as a whole will be of smooth or "streamline" exterior contour.

The invention will be well understood by reference to the following description of an illustrative embodiment thereof as shown in the accompanying drawing wherein there is illustrated a tool of the bolt cutter type and wherein:

Fig. 1 is an elevation of the tool;

Fig. 2 is an enlarged view of a portion of Fig. 1 with parts in section; and

Figs. 3, 4 and 5 are sections on the correspondingly numbered lines of Fig. 2 respectively.

Referring to the drawing, there is there shown a compound-lever tool including a pair of jaw-carrying levers 6 pivoted between their ends on the cross straps 8, since in the example shown the jaw levers do not cross, and have opposed cutting edges 10. The levers 6 are operated by handle levers 12 pivoted together at 14, while the tails of the jaw-carrying levers are pivoted (each through an intermediary element hereinafter more fully described) at the points 16 to the handles in such a way that the pivots 14 and 16 define a toggle which is straightened as the handle levers are brought together to press the jaws 10 together with great force. To permit adjustment the connection of the jaw-carrying levers to the handles is made through "adjusting sections" 18 pivoted to the jaw levers at 16 and to the handles at 20 and in operation are rigidly connected with one of the parts (herein the handle) to act as one therewith. Herein the section 18 takes the general form of a channel with its web overlying the outwardly facing edges of the handle and with flanges at either side thereof extending over the upper and lower portions of the jaw and handle levers and receiving the pivots 16 and 20. Adjusting means is provided for rigidly positioning the section relative to one of the parts, herein the handle, so that in use the pivot to that part, as 20, does not function as such.

The design of the securing means presents many problems. The dimensions of the parts are restricted and great strain is exerted thereon. Screw devices adapted respectively to push and pull the adjusting section relatively to the handle have been commonly used but in forms projecting from the side of the tool and have not only been unsightly but inconvenient in use as they are subject to damage and may catch on the work or other objects as the tool is being used. Various proposals have been made for operating the adjusting lever by means of a tail portion extending below the pivot 20 and adapted to be moved in or out by an adjusting means, but these have proved unsatisfactory on account of the great strains to which they are subjected.

In the present instance the adjusting section is swung outward or clockwise, viewing Fig. 2, about the pivot 20 and pushed away from the handle 12 by means of a headless set screw 22 tapped into the web of the section 18 and bearing against the edge of the handle lever, the set screw being provided with a hexagon socket 24 to receive a set-screw wrench of well known form. Acting in opposition to the strain of the set screw and tending to swing the adjusting section inward or counterclockwise, viewing Fig. 2, and thereby cooperating with screw 22 rigidly to position the section, suitable pulling mechanism is provided. The outwardly facing edge of the handle lever is here shown provided with an outwardly opening recess 26, the side walls of which are traversed by a cylindrical pin 28, the central portion of which is tapped. In one view the pin may be considered a nut trunnioned in the walls of the recess. This nut receives a screw bolt 30 having a globose head 32 in the form of a spherical segment which is received within a recess 34 in the web of the adjusting section 18 to cooperate therewith in the manner of a ball and socket joint. The outer end of the screw is provided with means to receive an axially applied turning tool and herein is illustrated as having a hexagon socket 36 for a set screw wrench. On movement of the adjusting section about the pivot 20 the pin 28 may shift angularly in its journal bearings while the head may turn in the socket 34. There is no impediment to a rotation of the bolt about its longitudinal axis when adjustment is to be made, whatever the angular position of the parts.

The handle lever 12 as a whole may be of generally I beam form having a central web and a peripheral flange. The walls of the recess 26 may be provided by a pad or thickening of the web

merging with such flange at either side as best seen in Fig. 2 and the entrance to the recess corresponds to an omission of the web at this location. The pin 28 may terminate flush with the faces of this pad at either side and the flanges of the section 18 overlie its ends.

The parts are so designed that originally the outer end of the screw 22 and the outer surface of the head 32 are substantially flush with the exterior contour of adjusting section 18. If the parts are to be adjusted to move the jaws 10 closer together, screwing in the screw 22 does not cause it to protrude, while the slackening off of the screw bolt 30 permits it to move through its nut-like pin 28 but does not move the head further outward beyond the outer contour of the adjusting section. The parts remain substantially flush, contributing to the appearance of the tool and to its utility since there are no parts to catch in the work or in exterior objects.

It will be seen that the device is simple, well adapted to delicate adjustment by simple tools, and may be ruggedly constructed to provide adequate strength in the somewhat restricted dimensions provided in a hand tool of the type under consideration.

It will be apparent that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and the present embodiment should therefore be considered in all respects as illustrative and not restrictive, as is in fact clear in several matters from the description itself. Reference is to be had to the appended claims to indicate those principles of the invention exemplified by the particular embodiment described and which it is desired to secure by Letters Patent.

We claim:

1. In a tool of the class described comprising a pivoted jaw-carrying lever, a pivoted handle lever and an adjusting section pivoted to and connecting said levers and means carried by the section cooperating with one of said levers to swingably adjust the section relatively thereto whereby to position relatively the other pivots, the combination wherein said means comprises a nut trunnioned in said part, a screw entering the same and having a globose head substantially received in a recess in said section to provide a joint of ball and socket type.

2. In a tool of the class described comprising a pivoted jaw-carrying lever, a pivoted handle lever and an adjusting section pivoted to and connecting said levers and means carried by the section cooperating with one of said levers to swingably adjust the section relatively thereto whereby to position relatively the other pivots, the combination wherein said part has a recess, a pin traversing the recess and journalled in the walls thereof, the pin being transversely tapped and receiving a screw, the screw having a globose head substantially received in a recess in said section to provide a joint of ball and socket type.

3. In a tool of the class described comprising a pivoted jaw-carrying lever, a pivoted handle lever and an adjusting section pivoted to and connecting said levers and means carried by the section cooperating with one of said levers to swingably adjust the section relatively thereto whereby to position relatively the other pivots, the combination wherein such means comprises a nut mounted on said section with freedom for angular movement relatively thereto, a threaded stem entering the nut and terminating substantially at the exterior surface of the section and provided at its outer end with a recess for receiving an axially applied turning tool, the screw having a part associated therewith at said outer end for engaging it with the section permitting angular movement of the screw axis relative to the section.

4. In a tool of the class described comprising a pivoted jaw-carrying lever, a pivoted handle lever and an adjusting section pivoted to and connecting said levers and means carried by the section cooperating with one of said levers to swingably adjust the section relatively thereto whereby to position relatively the other pivots, the combination wherein said section is of generally channel form with the web of the channel outwardly disposed and the flanges extending inwardly to overlie portions of said levers and providing bearings for the connecting pivots, and said means comprising screws extending through said web and having outer ends provided with means to receive an axially applied turning tool, which ends normally lie substantially inward of the exterior contour of the web, the screws engaging said one lever to push and pull the same respectively relative to said web.

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