Sept. 9, 1930. J. E. BERGMAN 1,775,270

COMBINATION TOOL

Filed Aug. 17, 1928

Fig. 1.

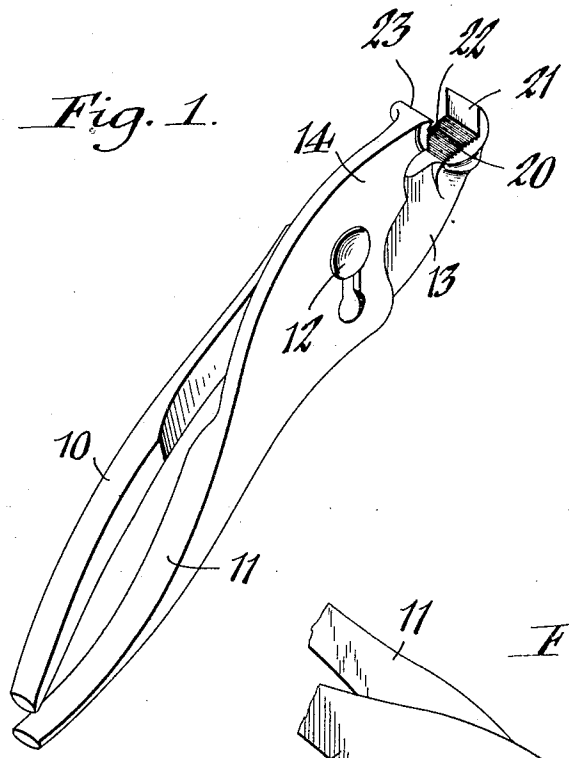


Fig. 3.

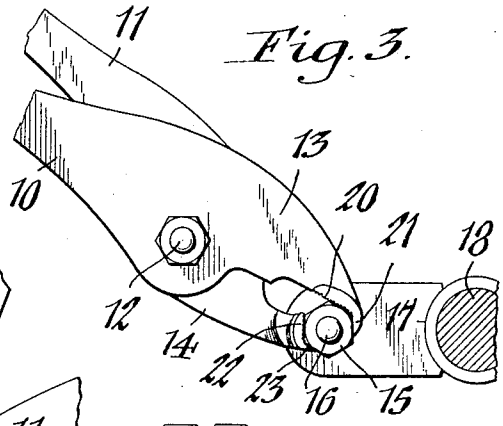


Fig. 2.

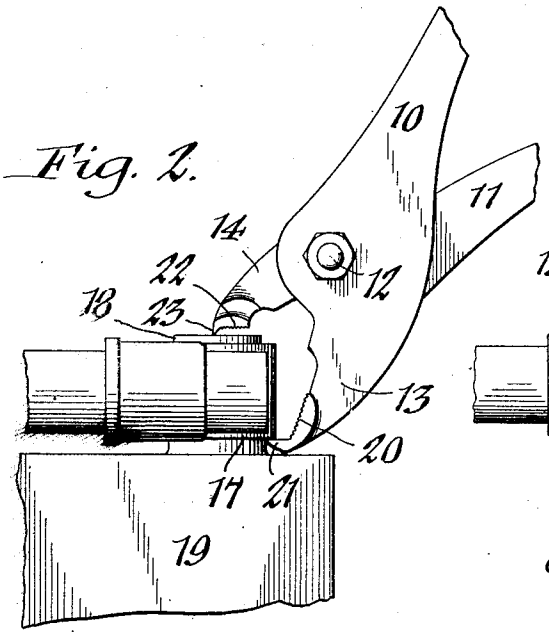
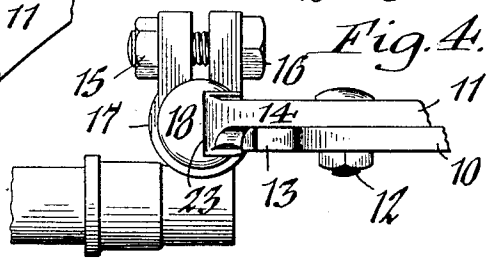


Fig. 4.



Inventor,
Jerome E. Bergman,
by Wacke P. Geyer
Attorney.

Patented Sept. 9, 1930 1,775,270

UNITED STATES PATENT OFFICE

JEROME E. BERGMAN, OF BUFFALO, NEW YORK

COMBINATION TOOL

Application filed August 17, 1928. Serial No. 300,195.

This invention relates generally to improvements in combination tools but more particularly to a plier-like tool designed primarily as a terminal puller for storage batteries, a nut wrench and as a lifter for facilitating the insertion and removal of such batteries from their boxes or containers.

Its chief object is the provision of a simple, efficient and inexpensive tool of this character whose parts are so organized and arranged as to conveniently accomplish the operations above mentioned.

Another object of the invention is to provide a tool which will readily and with a minimum effort effect the removal of the terminal-clamps from the battery posts without straining the battery-plates or the post, and which can be operated in limited spaces.

In the accompanying drawings:—

Figure 1 is a perspective view of the tool embodying my invention. Figure 2 is a fragmentary side elevation of the tool in the act of removing the terminal-clamp from a battery-post. Figure 3 is a similar view showing the tool in use as a nut wrench. Figure 4 is a top plan view of the parts shown in Figure 2.

Similar characters of reference indicate corresponding parts throughout the several views.

In the preferred embodiment of the invention shown in the drawings, the tool comprises crossed complemental handles 10, 11 pivotally connected adjacent their front ends, as indicated at 12, and terminating forwardly of such pivot in opposing substantially V-shaped jaws 13, 14. The jaw 13 of the handle 10 projects somewhat beyond the shorter jaw 14 of the handle 11 and the contour of the gripping faces of these jaws is such that in their partially open position they are adapted to grip two adjoining faces on diametrically opposite sides of the nut 15 of the clamping bolt 16, which, in the example shown in Figures 3 and 4, serves to hold the terminal clamp 17 in place on the post 18 of the battery 19.

The longer jaw 13 includes a straight, serrated gripping face 20 which extends in a direction substantially lengthwise of the tool and which terminates at its outer end in a lateral extension or tooth-like member 21 serving as a combined prying element and gripping face projecting in a direction toward the companion jaw 14 and disposed approximately at right angles to the adjoining serrated face 20. As seen in Figure 2, the free end of the tooth 21 is beveled to provide a knife-like edge for inserting it between the bottom edge of the terminal clamp 17 and the top face of the battery when using the tool to effect the removal of the clamp from the post. In cases where there is not sufficient space for the insertion of the tooth in this manner, it is allowed to bite into the side of the clamp adjacent its lower end to firmly grip it.

The shorter jaw 14 includes a serrated gripping face 22 disposed in opposing receding relation to the companion face of the jaw 13 and extending generally in a transverse direction relative to the corresponding serrated face 20 of the latter. At its outer end this gripping face terminates in a forwardly-facing extension or tooth-like member 23 which is disposed at substantially right angles to said gripping face and to the corresponding extension 21 of the jaw 13. The tooth 23 of the jaw 14 is likewise beveled to provide a knife-like edge which is adapted to bite into and firmly grip the top face of the battery post 18 in the manner shown in Figure 2, when removing the terminal clamp 17 from the latter.

In the normal closed position of the tool shown in Figure 1, it will be noted that the jaw 13 projects forwardly beyond the companion jaw 14 and that the latter is of smaller dimensions than the former and is disposed as a whole opposite the serrated face 20 of the jaw 13. The serrated, nut-engaging faces 20, 22 of the respective jaws are outwardly inclined from the inner ends thereof while the tooth-like extensions 21, 23 of the jaws are oppositely inclined, and the serrated face of each jaw is substantialy parallel with the tooth-like extension of the companion jaw. By this construction and arrangement, when the tool is opened to the position shown in Figure 2, its tooth-like extensions are properly disposed to engage the

post 18 and the clamp 17 to effect the loosening of the latter from the former by a prying or lifting action resulting from the pinching of the handles 10, 11, which assume a substantially upright position to conveniently operate the tool in the limited space usually available in the storage battery locations in automobiles. Likewise, in using the tool to tighten or loosen the nut 15 of the clamping bolt 16, the disposition of the jaw elements is such that they firmly grip the nut over extended bearing faces and in tightening, the shorter jaw 14 can be moved with a ratchet-like action over the corners of the nut without removing the tool when taking a new bite.

I claim as my invention:—

1. A tool for removing the terminal clamps from the posts of storage batteries, comprising a pair of crossed, pivotally connected handles terminating forwardly of the pivot in opposing jaws of unequal length, the tip ends of said jaws being substantially V-shaped on their inner sides to each embrace two adjoining faces on diametrically opposite sides of a nut with the opposing rear gripping faces of the jaws converging rearwardly and the corresponding front gripping faces of the jaws being comparatively short and converging forwardly in a longitudinally offset relation, the front end of the shorter jaw facing edgewise toward the front gripping face of the companion longer jaw and the free edges of said jaws bearing the front-gripping faces being slender and sharply tapered and adapted for gripping engagement with the top of the battery-post and the lower side of the terminal clamp, respectively, for exerting a lifting action on the clamp relative to the post when the handles are brought together.

2. A tool for removing the terminal clamps from the posts of storage batteries, comprising a pair of crossed, pivotally-connected handles terminating forwardly of the pivot in opposing jaws, the tip ends of said jaws having their inner faces substantially V-shaped to embrace diametrically opposite sides of a nut, the free ends of such V-shaped jaw portions being in the form of sharp tooth-like elements for engaging the battery-post and the clamp to effect a prying action of the latter relative to the former.

3. A tool for removing the terminal clamps from the posts of storage batteries, comprising a pair of crossed, pivotally connected handles terminating forwardly of the pivot in opposing jaws extending in substantially the same general direction as their respective handles, said jaws being shaped at their tip ends and at the opposing inner sides thereof to each embrace adjoining faces on diametrically opposite sides of a nut, the free ends of the jaws bearing the foremost nut-engaging faces being tapered to provide sharp tooth-like elements disposed at substantially right angles to each other, one of said tooth-like elements facing forwardly and the other laterally of the tool and adapted, respectively, to engage edgewise with the battery-post and the clamp to effect a lifting action of the latter relative to the former with the handles in a substantially upright position, the jaw with the laterally-facing tooth being longer than its companion jaw to bring the pivot of said jaws above the top of the battery-post in the applied position of the tool.

JEROME E. BERGMAN.