April 1, 1924. 1,488,759

E. M. LOFTUS

PLIERS AND WRENCH

Filed Oct. 27, 1922

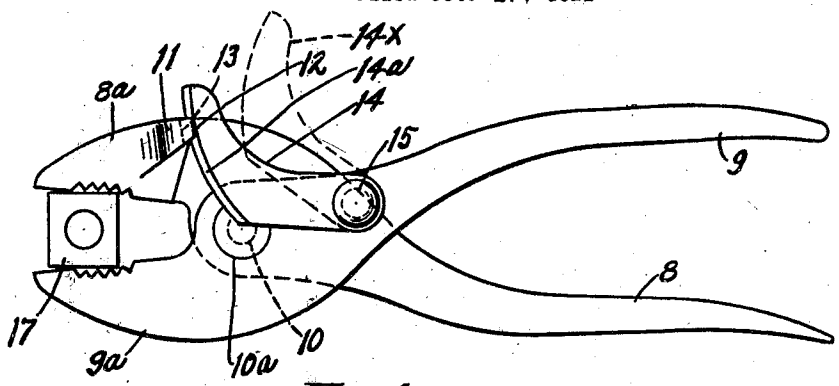


FIG. 1.

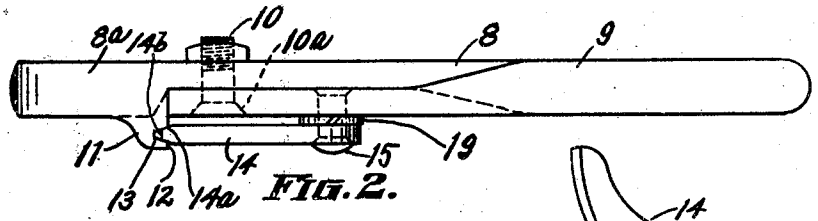


FIG. 2.

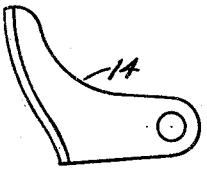


FIG. 4.

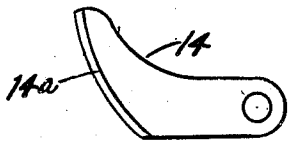


FIG. 3.

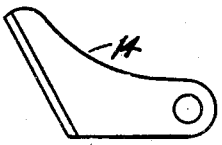


FIG. 5.

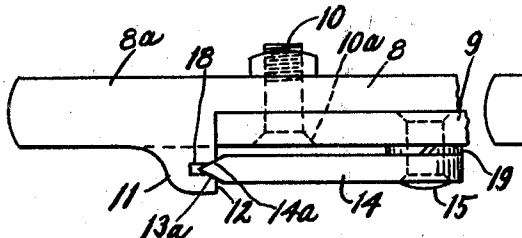


FIG. 6.

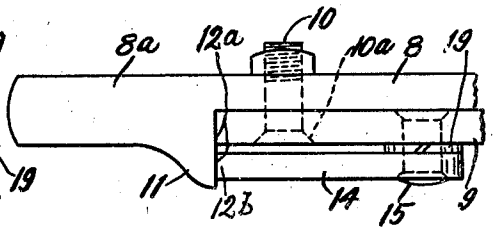


FIG. 7.

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# UNITED STATES PATENT OFFICE.

EDWARD M. LOFTUS, OF ST. PAUL, MINNESOTA.

## PLIERS AND WRENCH.

Application filed October 27, 1922. Serial No. 597,279.

*To all whom it may concern:*

Be it known that I, EDWARD M. LOFTUS, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Pliers and Wrenches, of which the following is a specification.

This invention relates to combination tools of the class known as pliers and wrench and the object is to further improve upon the device covered by my United States Patent No. 1,418,312 issued June 6, 1922.

In said former patent a ratchet-faced dog is employed to resist opening of the plier jaws at predetermined points when they are used as a wrench for turning different sized nuts; but after further experimenting I have discovered that no matter how fine the ratchet teeth are they will not hold the jaws at the desired exactness of opening to secure a firm grip on all sizes of nuts, bolt heads and other objects, and that such accuracy may be secured by omitting the teeth and giving the cam edge a V-shaped form and letting that edge engage frictionally in a V-shaped notch in the part engaged.

This new construction is illustrated in the accompanying drawing, in which:—

Fig. 1 is a side view of a pair of pliers and wrench showing my present improvements.

Fig. 2 is a top view of Fig. 1.

Fig. 3 is a detail view of the dog in Figs. 1 and 2.

Fig. 4 is a modification of Fig. 3.

Fig. 5 is Fig. 4 further modified.

Fig. 6 is an enlarged portion of Fig. 2 with a modification.

Fig. 7 is a view like Fig. 6 but with a different modification.

Referring to the drawing by reference numerals, 8 and 9 designate the two levers or members of the pliers crossed and pivoted together by a bolt 10 and said levers having, respectively, the jaws $8^a$ and $9^a$.

The jaw $8^a$ is provided at one side with an embossment 11 tapered upwardly and rearwardly (see Fig. 1) and terminating in a transverse face 12. In said face I provide a vertically disposed groove 13 adapted to be engaged by a correspondingly V-shaped segmental edge $14^a$ of a cam 14 which is pivoted as at 15 to the lever 9 in about the relative position shown in Fig. 1.

In Figs. 1, 2, 6 and 7 the head $10^a$ of the pivot bolt 10 is shown countersunk in member 9 so that the cam 14 may swing over it.

When using my pliers as a wrench, for example as in turning a nut 17 (Fig. 1), the cam 14 is first swung back to idle position $14^x$ and the jaws $8^a$—$9^a$ are brought into contact with the nut, the cam is then swung into frictional contact with groove 13 in the embossment 11 and prevents the jaws from spreading and locks the jaws in set position on the nut.

In Fig. 2 the V-shaped cam edge is shown as having its outer edge faced as at $14^b$ thus permitting only the oppositely inclined faces to contact with the sides of the groove 13 in the embossment. The cam illustrated in Fig. 5 has a straight V-shaped edge and in Fig. 4 an ogee edge is shown, such variations being of possible advantage in various types of pliers. In Fig. 6 the segmental cam edge $14^a$ is a full V-shape and the groove $13^a$ of the embossment has a registering inner groove 18 into which the sharp edge of the cam extends without binding said cam. In Fig. 7 the embossment 11 has merely a transverse shoulder $12^a$ adapted to be engaged by a correspondingly faced edge $12^b$ on the cam 14.

19 is a spring washer holding the cam frictionally so it can not engage accidentally.

In Fig. 2 is shown that the V-shaped edge of the cam by being blunt will not reach the bottom of the groove 13, while in Fig. 6 this same purpose is attained by the clearance 18, even if the cam edge is sharp.

What I claim is:

1. A pair of pliers comprising two crossing jaw levers with a pivot through the crossing, one of said jaws having at one side a lug with a rearward face, a pivoted cam mounted on the other lever and formed with a slightly inclined face adapted to engage with its different points the face of the projecting lug and thus hold the jaws more or less separated when they are used as a wrench; said lug having a V-shaped groove for the edge of the cam, and said cam having a V-shaped edge engaging frictionally in the groove.

2. The structure specified in claim 1, in which said cam and groove are so shaped

that the cam can never reach the bottom of the groove.

3. The structure specified in claim 1, in which the contacting edge portion of the cam is segmental outward edgeways intermediate its ends.

4. The structure specified in claim 1, in which the contacting edge portion of the cam is segmental edgeways outward between the ends of said edge; the edge being also of an ogee curvature.

In testimony whereof I affix my signature.

EDWARD M. LOFTUS.