May 30, 1933. J. R. CARROLL 1,911,429

RIGGING TOOL

Filed Sept. 6, 1932

FIG. 5.

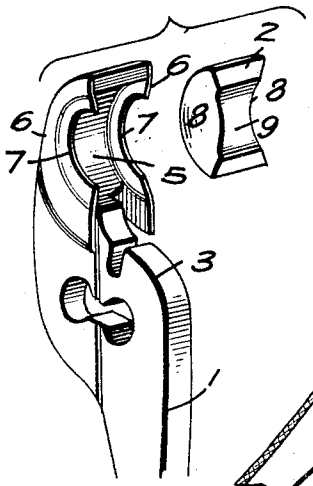


FIG. 1.

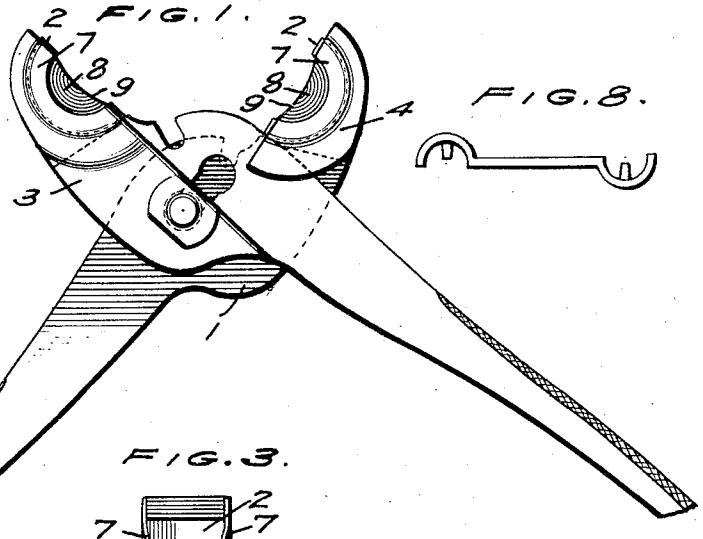


FIG. 8.

FIG. 3.

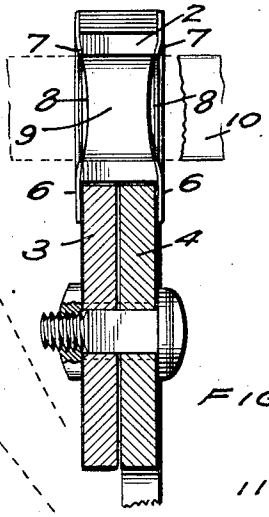


FIG. 2.

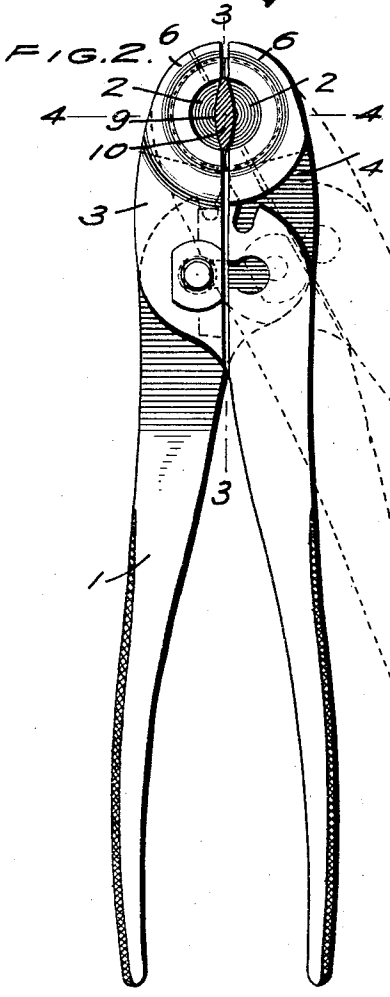


FIG. 4.

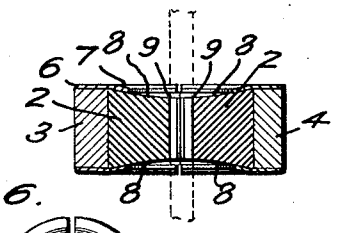


FIG. 6.

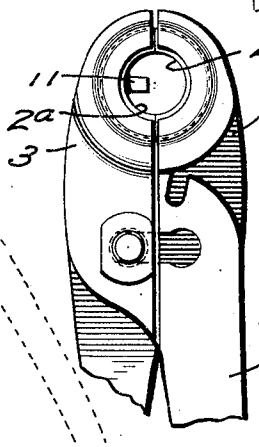
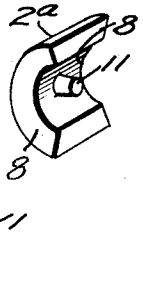


FIG. 7.



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UNITED STATES PATENT OFFICE

JOHN R. CARROLL, OF URBANA, ILLINOIS

RIGGING TOOL

Application filed September 6, 1932. Serial No. 631,833.

(GRANTED UNDER THE ACT OF MARCH 3, 1883, AS AMENDED APRIL 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to a rigging tool for use in assembling and aligning aircraft and an object of the invention is to improve the present unsatisfactory means of turning turnbuckle barrels and streamline wires in aligning an airplane.

With the above in view, the invention provides an improved rigging tool in the nature of hand pliers in which rotatable jaws are mounted in the head of the pliers and retained in such a way as to be free to rotate except when pressure is exerted on them by holding the pliers closed. The construction is such as to permit different types of jaws to be used interchangeably, each set of jaws being shaped in conformity with the nature of the work and designed to completely embrace or grip the work without damage or injury to the latter.

The objects and advantages of the invention are attained by the construction, arrangement, and combination of parts hereinafter fully described with reference to the accompanying drawing, in which:—

Figure 1 is a side view of hand pliers adapted, in accordance with the invention, for turning streamlined wires, the jaws being in open position;

Figure 2 is a side view of the same tool with the jaws closed;

Figure 3 is a vertical section on line 3—3 of Figure 2;

Figure 4 is a horizontal cross section on line 4—4 of Figure 2.

Figure 5 is a detail view, in perspective, of one of the plier jaws and its accompanying jaw members;

Figure 6 is a side view of hand pliers modified for turning turnbuckle barrels;

Figure 7 is a detail perspective view of one of the turnbuckle barrel-gripping jaw members, and

Figure 8 is a side view of a conventional tool.

At present, a cresent wrench is generally used for turning streamlined wires and an instrument in the nature of a drift pin or nail is generally used for turning turnbuckle barrels. A tool of the type shown in Figure 8 is also used for this purpose. These several instruments have in common the disadvantage of a relatively long arm or "handle" which must either rotate around with the streamlined wire or the turnbuckle barrel, or else the instrument must be withdrawn from one side of the wire or barrel and then reinserted or reapplied to the other side.

In case of double wires, i. e. wires running parallel and usually 6 to 10 diameters apart, it is not possible to rotate the instrument around with the wire or barrel and it becomes necessary to constantly withdraw and reapply the instrument. This results in a loss of time and in wear and tear on the wire and barrel. Furthermore, in the case of double wires, it becomes necessary to force one of the double wires either up or down so as to be able to apply and reapply the instrument, and when the wires are in "stiff" tension, this is often difficult to do. The instrument, if of the drift pin type, will in time enlarge and distort the hole in the turnbuckle barrel; and the crescent wrench, due to the fact that it grips the streamlined wire near the edges, will nick and mar the wire.

In the improved tool of the present invention, the jaws grip the streamlined wire all the way around and the same is true in the case of the turnbuckle barrel. Hence, there is no possibility of injuring either the wire or the barrel. Moreover, with this improved device the handle of the tool need not rotate around a complete circle in turning the wire

or barrel. The tool is simply swung back and forth through a short arc without being disengaged from the wire or barrel. Therefore, it is not necessary to constantly remove and reapply the tool in the case of double wires or turnbuckle barrels in close proximity to the wing surface or a strut. This results in a considerable saving in time and labor as many of the interplane brace wires on an airplane are double and most turnbuckle barrels are in close proximity to some part of the structure of an airplane.

This rigging tool is of simple construction and consists of hand pliers 1 of a conventional and well known type modified for the purpose of the invention to the extent that the head of the pliers is formed with a race or channel for slidably accommodating a pair of rotatable jaw units or work-gripping members 2 or 2*a*. To this end each plier jaw 3 and 4 is formed with a semi-circular groove or recess 5, the side walls 6 of which have inwardly directed portions 7 adapted to engage the beveled or concaved side faces 8 of the jaw units for preventing the latter from falling out of the race when the plier jaws are open.

The jaw units will vary in construction and design in accordance with the nature of the work for which intended. For streamlined wires, the jaw units 2 are used and as shown in Figures 1 to 5, inclusive are formed, preferably, from solid cylindrical stock with their meeting faces slightly concave as at 9, to completely and snugly embrace the streamlined wire 10. For turnbuckle barrels, the jaw units 2*a* are formed from tubular stock and one of the jaw units is provided with a peg or pin 11 adapted to enter the hole in the turnbuckle barrel.

In using the rigging tool, the latter is applied to the work, as shown in full lines in Figure 2, and the handles of the pliers are drawn together to exert pressure on the jaw units, causing them to tightly grip the work and at the same time become "locked" between the work and the base of the grooves or race. Hence, when the tool is moved to the dotted line position, the jaw units will rotate with the head of the pliers and thus, turn the streamlined wire 10. When the tool has been swung through a short arc, the pressure on the handles is released and the jaw units are then "unlocked" so that upon the return swing of the plier handles, the head of the pliers moves readily around the jaw units, the latter remaining stationary and in engagement with the wire 10. By simply swinging the tool back and forth through a short arc and alternately applying and releasing the pressure on the handles of the pliers, the wire or turnbuckle barrel is readily turned without the necessity of constantly removing and reapplying the tool to the work.

I claim:

1. A tool for turning work about an axis comprising a pair of pliers the jaws of which are grooved to provide a circular race, jaw units loosely mounted in said race and slidable freely around the same in the absence of pressure on the jaws, and handle means for exerting pressure on the jaws and jaw units for preventing independent relative rotation thereof.

2. A tool for turning streamlined wires comprising hand pliers having jaw units which completely and snugly embrace the wire, and a channeled head loosely seating said jaw units for sliding movement therearound, said head being responsive to pressure on the handles of the pliers for tightly seating said jaw units against movement independently of the head.

3. A rigging tool for turning streamlined wires, turnbuckle barrels and other work about an axis, comprising circular work-gripping members for engaging the work to be turned, a supporting head embracing the said circular work-gripping members and normally free to rotate about the members, and means for contracting said head and so exerting pressure on said members for causing same to move in unison.

4. A rigging tool for use in assembling and aligning aircraft comprising a pair of pliers having the plier jaws grooved to provide a circular race, a pair of semi-circular jaw units dovetailed in said race for sliding movement therearound, and jaw handles for exerting pressure on the said plier jaws and the jaw units for binding the same together for concurrent movement, so that by swinging the tool back and forth through a short arc and alternately applying and releasing the pressure on the handles, the work is readily turned without the necessity of constantly removing and reapplying the tool to the work.

5. A tool for turning turnbuckle barrels comprising a pair of pliers having the plier jaws recessed to provide complemental grooves forming a circular race and semi-circular jaw units seated in the said race and being slidable around the same in the absence of pressure exerted on the plier jaws, one of said jaw units having a peg adapted to extend into an orifice in the turnbuckle barrel.

6. A tool comprising hand pliers having movable jaws and means to mount the jaws free for rotation when the pliers are opened and yet capable of engaging the jaws so rigidly by closing the pliers as to prevent them from turning.

7. A rigging tool for use in assembling and aligning aircraft members comprising hand pliers having jaw units and jaws grooved to provide a circular race to mount the jaw units free for rotation when the

pliers are opened and yet capable of engaging the jaw units so rigidly by closing the pliers as to prevent them from turning.

8. A rigging tool comprising hand pliers, rotatable co-acting jaw members in the head of the pliers, and jaw-mounting and retaining means in said head to mount the jaw members free for rotation when the pliers are opened and yet capable of engaging the jaw members so rigidly by closing the pliers as to prevent them from turning.

In testimony whereof I affix my signature.

JOHN R. CARROLL.