CHAPTER 2

RIVNUTS AND TOOLS

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LIST OF ILLUSTRATIONS

General

1. Rivnuts are essentially hollow internally-threaded rivets, which are used on aircraft for the attachment of such components as de-icing overshoes to aerofoils, or carpets and treadways to sheet metal floors. They can be inserted and riveted from one side of a structure by the use of two hand-tools, one being used for the purpose of cutting a notch or keyway in the side of the hole in which the rivet is to be inserted and the other for the purpose of upsetting the sleeve portion of the rivnut after it has been inserted. A projection or key which engages with the keyway is formed beneath the head of the rivnut during manufacture whereby it is prevented from rotating when a setscrew is being screwed into, or out of, the rivnut. Rivnuts are threaded to various British and American standards as adopted on different types of aircraft and it is essential that only screws having threads of the same denomination as the selected rivnuts should be used. The tools required when fitting rivnuts are described below, followed by the method of using the tools.

Keyway cutting tool

2. The keyway cutting tool (see fig. 1) consists of a tube in which is housed a detachable spring-loaded plunger, which carries a steel cutter and is operated by means of a handle. The handle is

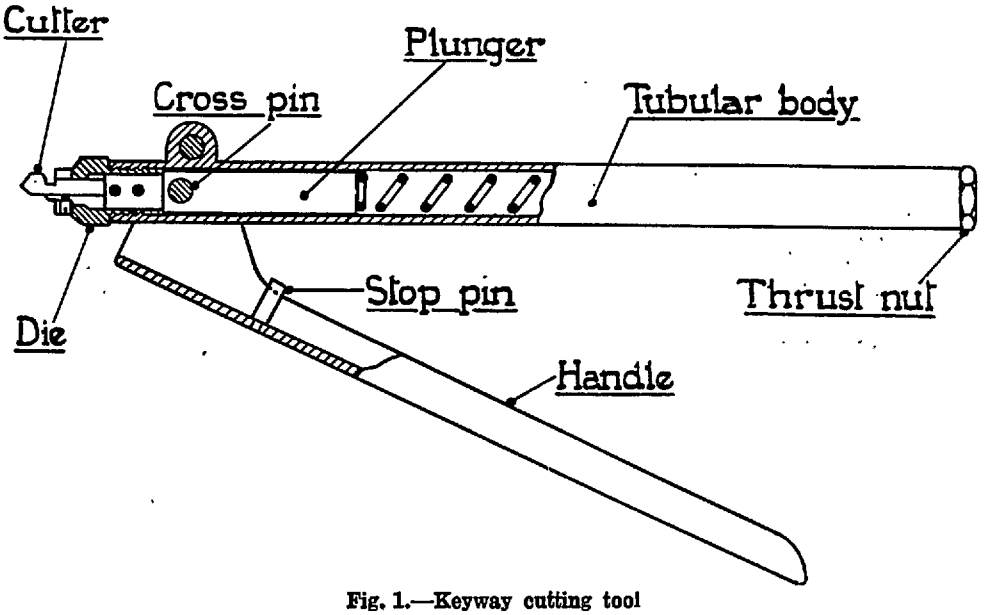

Fig. 1.—Keyway cutting tool

hinged at one end of the tube and is pivoted at the same end to the plunger. The steel cutter protrudes from one end of the plunger and when the handle is operated the cutter is drawn into the tube end or die, against the pressure of an internal return spring. A stop pin is fitted to the handle for the purpose of limiting the length of the working stroke of the cutter and preventing injury to the hands of the operator when the tube and the handle are forced together. The cutter is attached to the end of the plunger by means of two steel pins which can be removed when it is required to replace the cutter by a new one. In order to remove the plunger, the thrust nut should be removed from the opposite end of the tube to the cutter, the coil spring can then be extracted, after which the plunger cross-pin should be removed, thus allowing the plunger to slide out of the tube.

Rivnut clinching tool

3. The rivnut clinching tool (see fig. 2) is comprised of a tubular housing, a retractable spring-loaded plunger and a handle which is hinged to the tube and pivoted on the plunger. A spindle, in two sections mounted axially through the tube and the plunger, projects from each end of the tube and is threaded at one end to fit the rivnut threads, the other end being fitted with a small handwheel by means of which the threaded end can be screwed into a rivnut. The spindle is free to rotate in both the tube and the plunger, while axial movement, constituting the working stroke, is limited by the plunger and its handle. The detachable screwed end of the spindle is held in the plunger by means of a small setscrew; alternative ends, threaded either to U.S. or B.A. standards, are available, to suit the rivnuts.

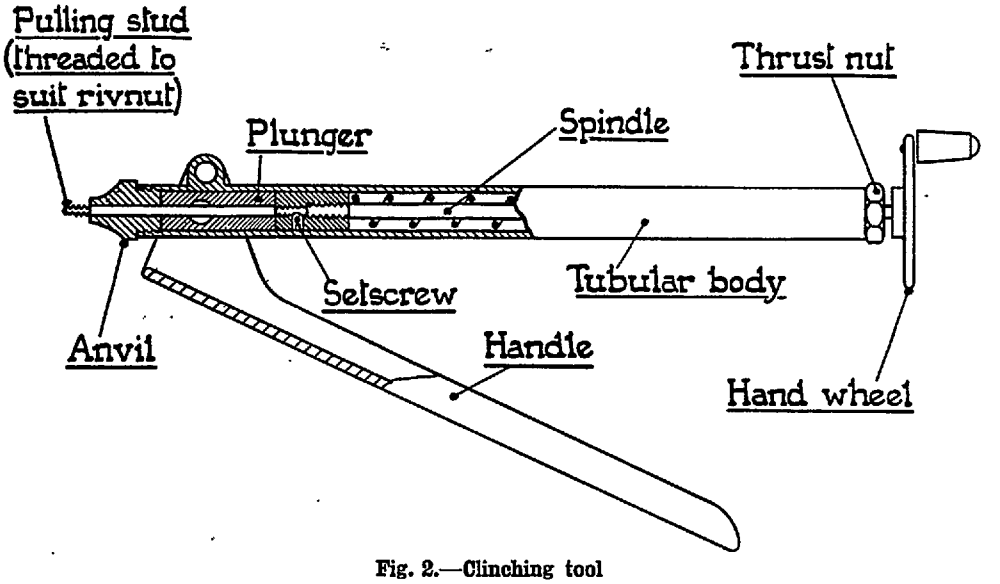

Fig. 2.—Clinching tool

Fitting rivnuts

4. Rivnuts should be fitted as follows:—

(i) A hole $\frac{3}{16}$ in. dia. should be drilled in the sheet-metal member and the edges of the hole chamfered slightly to remove burrs and sharp edges. A small hooked cutter may be used to remove burrs on the underside when this is not accessible from below.

(ii) The cutter of the keyway-cutting tool should now be inserted in the hole which has been drilled and, holding the tool square with the sheet-metal, the handle should be gripped and the cutter operated (see fig. 3, sketch I).

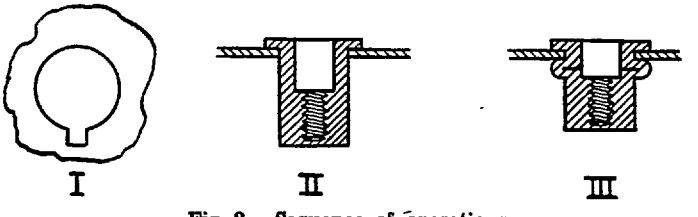

Fig. 3.—Sequence of operations

(iii) The rivnut should be screwed on to the threaded end of the clinching tool spindle until all the threads are engaged and the head of the rivnut is against the anvil on the tube end. The rivnut should then be inserted in the hole which has been drilled and the key engaged with the keyway and, holding the tool squarely, the handle should be gripped and drawn to the tubular body of the tool until a solid resistance is felt. The small handwheel should then be used to screw the tool spindle out of the rivnut, meanwhile keeping the tool in line with the axis of the rivnut.

Removing rivnuts

5. A rivnut which has worked loose, or one in which the screwthreads are damaged, should be removed and replaced by a new one. In order to remove a rivnut it should be drilled out by means of a suitable hand-drilling machine. A $\frac{5}{16}$ in. drill should be used and care should be taken to keep the drill central and in line with the axis of the rivnut in order to ensure that the sheet metal does not sustain any damage during the operation. If the drill has been centred correctly it should only be necessary to drill through the head of the rivnut to separate the head from the body, but in the event of the drill wandering, the head of the rivnut should be carefully filed off, the surface of the surrounding sheet metal being protected meanwhile by means of a suitable mask cut from shim steel 0·002 in. thick, having a hole in the centre, through which the rivnut head may protrude.

Blanking-off rivnuts

6. Rivnuts, which have been installed and are not in use because of the removal of some component, should be blanked off by means of the special screws provided. These screws have thin countersunk head, slotted cross-wise, and a special cruciform screwdriver bit is required for inserting and removing them.

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