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_____ D BULLETIN



A FLUSH-RIVET MILLING TOOL

By Robert Gottlieb
Langley Memorial Aeronautical Laboratory

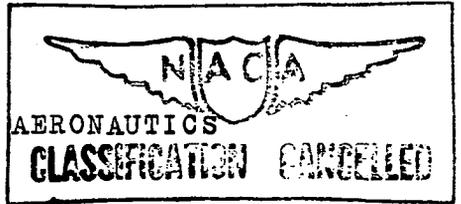
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June 1942



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TECHNICAL BULLETIN

A FLUSH-RIVET MILLING TOOL

By Robert Gottlieb

The investigation of machine-countersunk flush rivets for aircraft described in reference 1 revealed the necessity of having the height of the rivet heads greater than the depth of the countersunk holes if tightly riveted joints were to be obtained. If ordinary roundhead rivets were inserted from the opposite side of the joint and the countersunk heads formed in the driving of the rivets filled the countersunk holes completely, still tighter joints were obtained. In either case the rivets protruded above the skin surface after driving, and the protruding portion of the rivet heads had to be removed in order to obtain flush rivets.

A number of requests have been received for a description of the tool used to mill off the protruding portion of the rivet heads. This report contains assembly and detail drawings (figs. 1 to 5) of the latest flush-rivet milling tool used at the NACA Structures Research Laboratory. Figure 6 shows the tool in operation.

This tool is quite satisfactory for 1/8-inch rivets, but a more powerful motor is recommended for use with larger rivets.

Langley Memorial Aeronautical Laboratory,
National Advisory Committee for Aeronautics,
Langley Field, Va.

REFERENCE

1. Lundquist, Eugene E., and Gottlieb, Robert: A Study of the Tightness and Flushness of Machine-Countersunk Rivets for Aircraft. NACA R.B., June 1942.

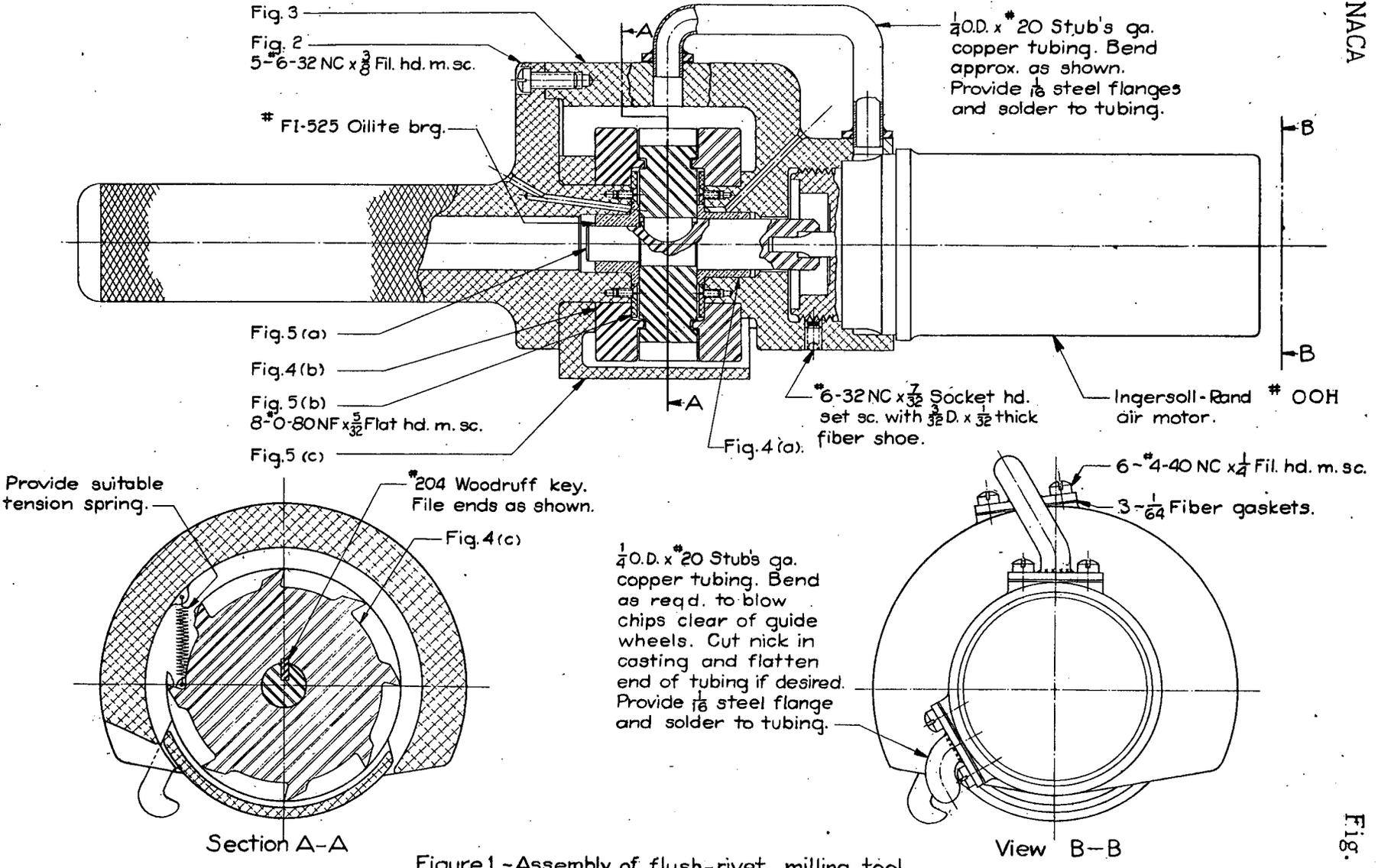


Figure 1.-Assembly of flush-rivet milling tool.

*36(.1065) Tap drill $\frac{7}{16}$ deep.
6-32 NC Tap $\frac{1}{8}$ deep.
5 holes to match Fig. 2.

Push fit with Fig. 2.

*56(.0465) Tap drill $\frac{7}{32}$ deep.
*0-80 NF Tap $\frac{5}{32}$ deep.
4 holes to match Fig. 5 (b).
Holes shown 45° out of position in section view.

$\frac{1}{16}$ Drill oil hole. C'sink to enlarge end and chip connecting groove to chamfer as shown.

$\frac{3}{64} \times 45^\circ$ chamfer
Press fit with Fig. 4 (a)
Running fit with Fig. 4 (b)

$\frac{5}{16}$ -20 Am. Nat. form thd.
Close fit with motor.

Turning fit on motor.
These diam. shall be concentric with reamed hole.

Abt. $\frac{1}{32} \times 45^\circ$ chamfer

This dimension shall provide close running clearance for Fig. 4(c) at assembly.

This dimension shall provide close running clearance for Fig. 4(b) at assembly.

*36(.1065) Tap drill.
6-32 NC Tap.

*43(.089) Tap drill.
4-40 NC Tap.
6 holes.

Letter G(261) Drill.
3 holes.

Drill to suit spring.
C'sink both ends as shown.

Cast aluminum alloy reqd.

Section A-A

Section B-B

Figure 3. - Details of cutter housing.

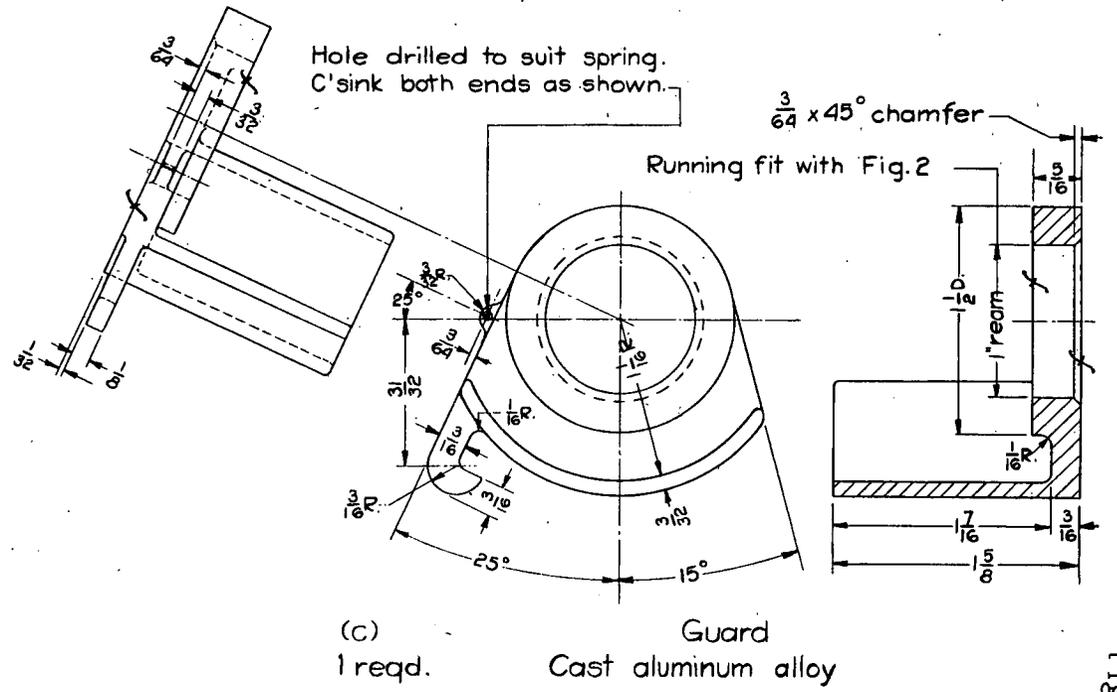
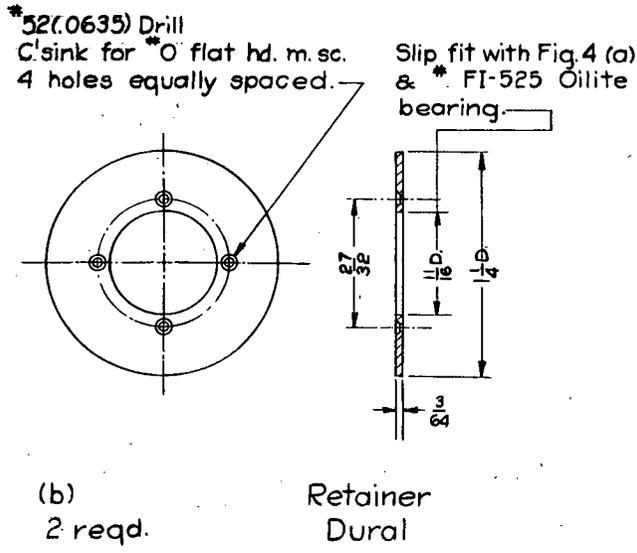
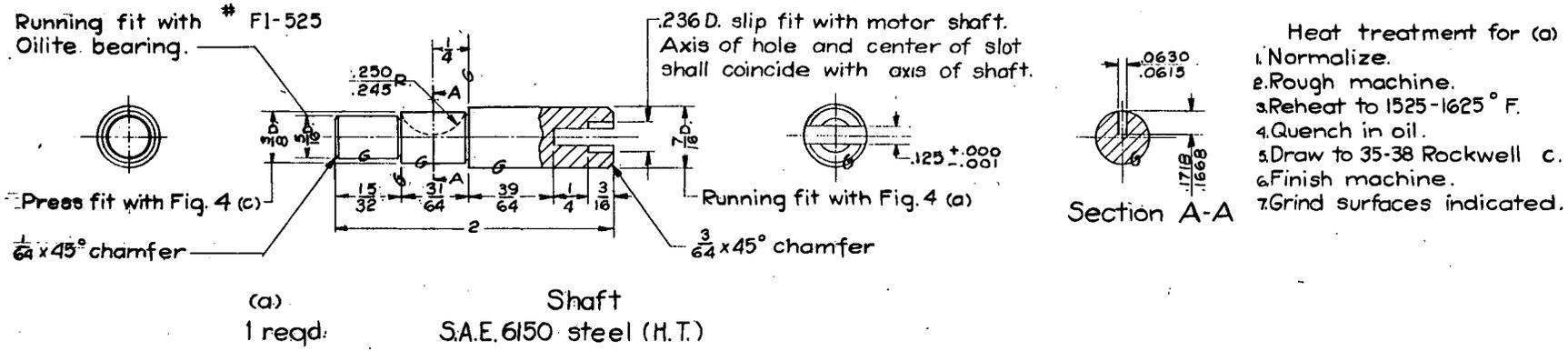


Figure 5. - Details of shaft, retainer, and guard.

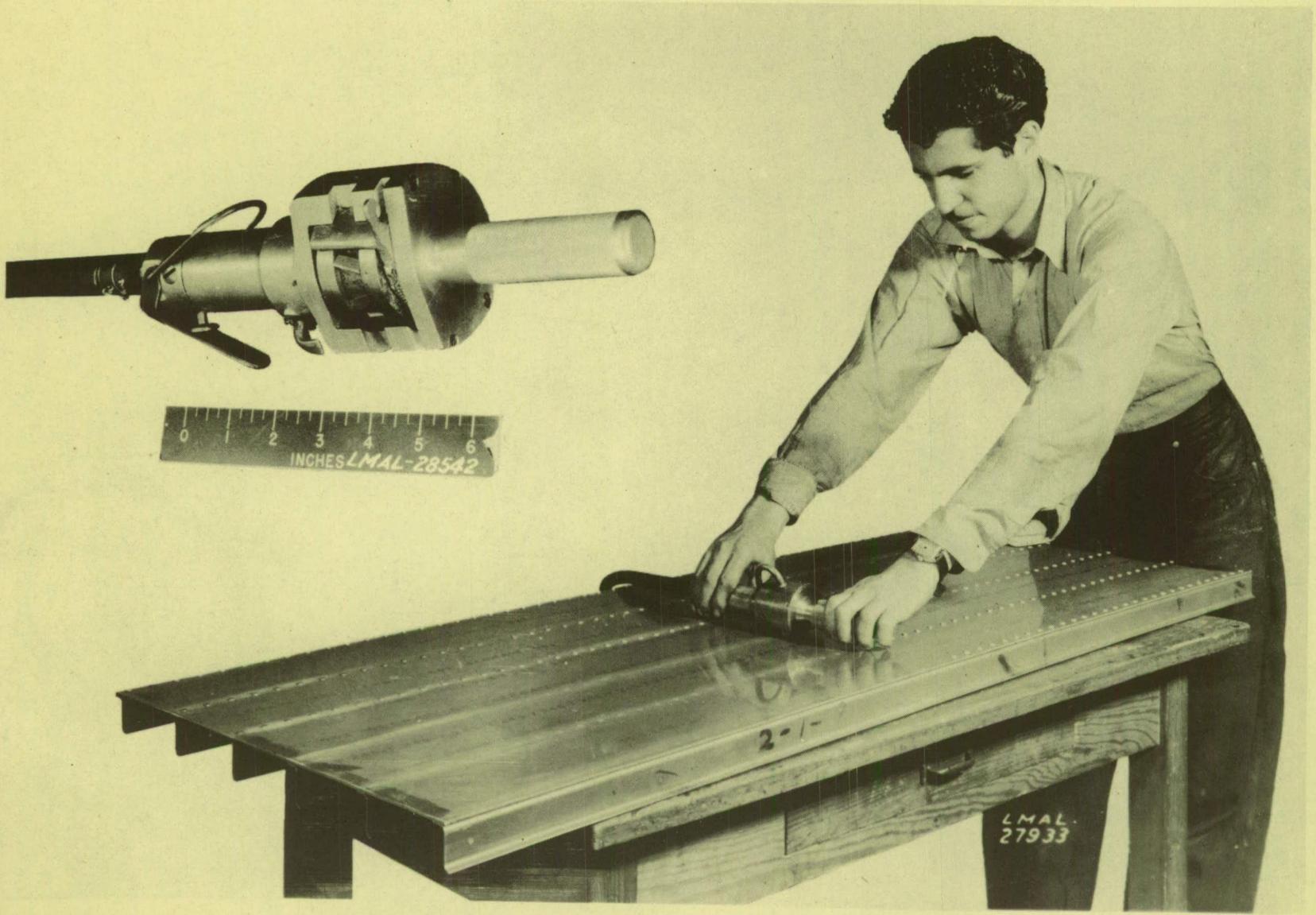


Figure 6.- Flush-rivet milling tool for removing the protruding portion of the rivet head.