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July 19th, 1943.

R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1453.

An Examination of Engine Mount Fork Ends
Fabricated by Various Methods.

CONFIDENTIAL

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An Examination of Engine Mount Fork Ends
Fabricated by Various Methods.

Origin of Material and Object of Investigation:

Four engine mount fork ends, as shown in Figure 1, were submitted^o on July 9th, 1943, by A/C A. L. Johnson, for Chief of the Air Staff, Department of National Defence, Air Services, Ottawa, Ontario.

Probably because of the design of the part, it was not possible to drill the lug holes perfectly round. Two methods of correcting this condition have been developed. In the first the holes were made round by cold deformation. The second method involved heating of the lugs before forming to shape.

It was requested that the lug holes in the parts submitted be checked for roundness and the material be examined for any effect that the heating might have on its properties.

^o Letter, File No. 902-38-1 (AMAE DAI).

Check for Roundness:

The roundness was checked by means of a pin that was a press fit into the holes. On insertion of this pin into the holes of both heated and unheated fork ends, polish marks were left at all points around the circumference of the holes of both, thereby indicating that the holes were round.

Hardness Survey:

A hardness survey was conducted around the hole in both the heated and the unheated fork ends. Rockwell "B" hardness was used. The hardness in both was uniform, ranging from Rp 87 to Rg 92.

Macroscopic Examination:

The temper colours on the heated lugs indicated that the maximum temperature reached was about 200°F.

Microscopic Examination:

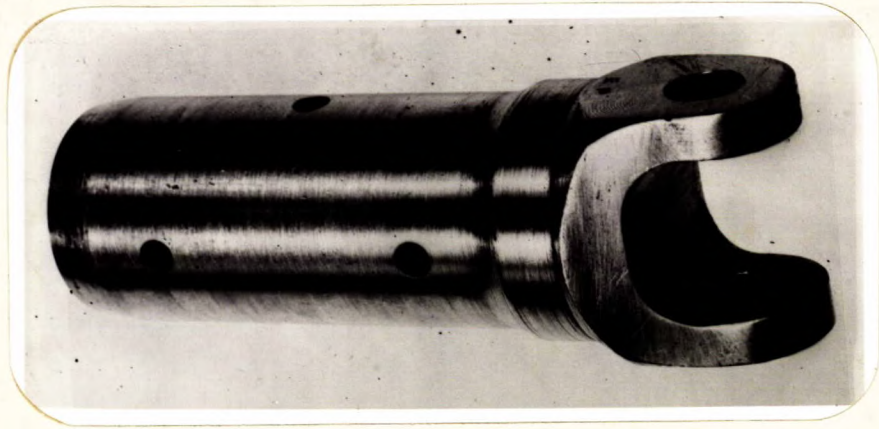
A lug from a heated and one from an unheated fork end were prepared for the microscope. The structures are shown, at magnifications of 200 diameters, in Figures 2 and 3. These show no significant difference in microstructure.

Conclusions:

1. The holes may be returned to roundness either cold or heated.
2. Heating to the degree used on the fork ends submitted has no harmful effect on the properties of the steel.

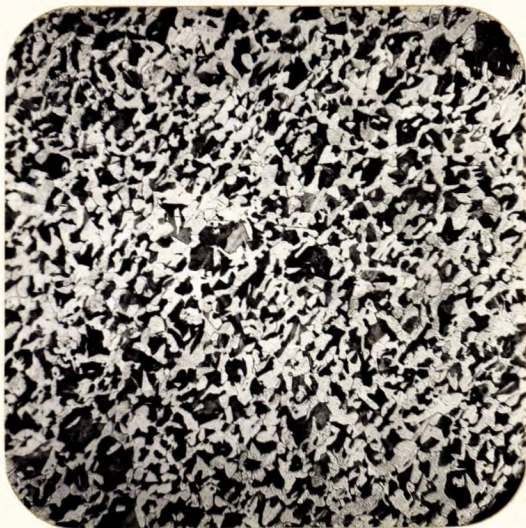
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Figure 1.



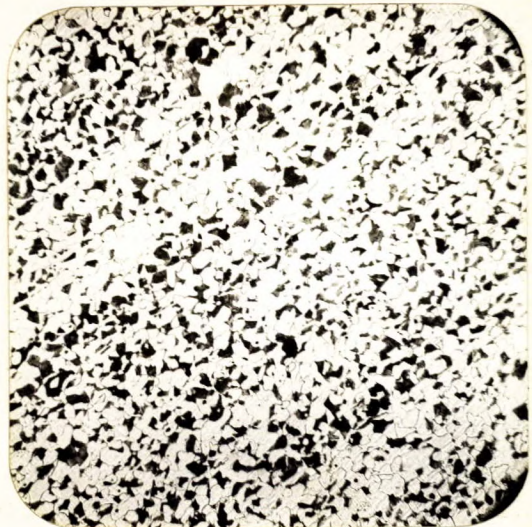
PHOTOGRAPH OF ENGINE MOUNT FORK END.

Figure 2.



X200, picral etch.
PHOTOMICROGRAPH SHOWING
STRUCTURE IN UNHEATED LUG.

Figure 3.



X200, picral etch.
PHOTOMICROGRAPH SHOWING
STRUCTURE IN HEATED LUG.