APPENDIX
Item B

CC: S. M. Alvis) In
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V. G. DeReus
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CLASSIFIED CONFIDENTIAL

Ilion, New York
August 26th, 1947

TO: G. E. Pinckney
Bridgeport

FROM: W. E. Leek

SUBJECT: M/721 - PERFORMANCE AT EXTREME LOW TEMPERATURE CONDITIONS

This letter is in answer to your recent inquiry concerning the above subject. We have previously tested pilot and production line M/721 rifles under both ice and cold conditions at -60°F. The objectives of the tests at this temperature were as follows:

1. To determine the gun's functional performance at -60°F. under cold and ice conditions.
2. To determine the gun's strength* characteristics at -60°F. under cold and ice conditions.

Results of the tests show:

1. a. That the Safety will freeze to the Receiver under extreme ice conditions but can be broken loose by hitting the Safety and surrounding area with an object the size of a pocket knife.

   b. That under extreme freezing conditions it is possible for the Trigger to freeze to the Trigger Guide Plate, which prevents firing of the gun.

   c. That the functional performance of the gun is excellent with the exception of (a) and (b) above.

2. That the strength of the M/721 under these conditions is more than adequate.

We are recommending in our report which will follow the testing of production guns, that the Trigger Guide Plate be made of a plastic material, preventing freezing of the Trigger.

Your inquiry mentioned that the natives in the interior of Alaska were concerned with the functional performance of the Ejector and Extractor of this gun during extreme cold conditions. We have found that the Ejector and Extractor as now used in the M/721 are far superior in performance to those of other manufacture because they are enclosed in the bolt head, which allows less surface to be subjected to the elements. We have encountered no functional difficulties with these component parts.

/s/
W. E. Leek
Engineering Section
Technical Department

WEL:MC

*The strength of steel decreases at -60°F. The chamber pressure developed by 30-06 ammunition at -60°F. sometimes approximates proof pressures.