Report #5

MONTHLY PROGRESS REPORT

Development of Explosives and Initiators for Special Operations

by

Theodore B. Johnson

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&
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Remington Arms Company, Inc.
Bridgeport, Conn.

for

Picatinny Arsenal
Dover, New Jersey

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DEVELOPMENT OF EXPLOSIVES AND INITIATORS FOR SPECIAL WARFARE OPERATIONS

(U) Reports No. 1 through No. 5 described the development of an improvised detonator and an improvised fuse, both based on an initiating explosive prepared from litharge and picric acid. In order to provide as much latitude as possible in the preparation of the improvised munitions, alternate materials are being investigated. During the present report period, emphasis was placed on alternate fuse materials.

(U) Using the method of preparation described in Report No. 3 it has been shown that hemp string is a satisfactory substitute for cotton string. However, sisal twine and a very thin strand of cotton string are not satisfactory.

(U) Gum arabic has been investigated as an alternate for glue in the preparation of an improvised fuse, as follows:

1. Cotton string was soaked in a 5% gum arabic solution, removed and then dipped in a suspension of picrate explosive, which had been prepared by suspending 10g. of finely powdered picric acid in 15 ml. of water and stirring in, over a 5 minute period, 10g. of litharge.

2. The string was removed from the picrate explosive suspension and air dried.

(U) Fuse as prepared above burned at a rate of about 3" per second. This is somewhat faster than the fuse made with glue, but the combustion appeared to be satisfactory.

(U) Other fuses have been made by impregnating string with

a. ammonium nitrate and

b. a mixture of ammonium nitrate and silver oxalate.

The sensitivity of these fuses to high humidity, reported last month, was overcome by dipping them in molten paraffin wax. The ratio of paraffin to ammonium nitrate was too high, however, the fuses burned with a flame that was dependent on air and combustion was stifled by confinement such as the mouth of the improvised cartridge case detonator. Using the string fuse impregnated with a mixture of ammonium nitrate and silver oxalate, tests will be made to determine if there is a lesser amount of paraffin which will provide moisture protection without at the same time making the fuse dependent on air for combustion.

(U) In other fuse tests, cotton strings were immersed in a warm slurry of safety match heads in water. After air drying

combustion was not much improved over the string alone.

(U) Several batches of the improvised picrate initiating explosive have been made in preparation for tests involving a complete improvised demolition package, fuse, initiator, booster and explosive. In checking the quality of the initiator by attempting to detonate picric acid booster, about 50% failures were obtained. The cause of the failures is being investigated.

(U) At this time, it appears that a satisfactory improvised picrate fuse has been made. The improvised cartridge case-picrate explosive detonator has been satisfactory in most tests, but unexplained failures have occurred with the latest batches of picrate explosive. Complete detonations of 50g. picric acid boosters have been achieved by the use of the cartridge case-picrate explosive detonator, so that picric acid could be used as the demolition explosive. It remains to be determined whether the picric acid booster will detonate other more readily obtainable high explosives such as ammonium nitrate.

Man Hours Expended

	July		August	
	Exempt	Non Exempt	Exempt	Non Exempt
Research and Engineering	76		73	
Shop and Testing		33		0

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