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REPORT  
ESTAC-273834  
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AS

MEMORANDUM REPORT

M62-19-1

DESCRIPTION AND OPERATION  
OF A HAND HELD WIRE GUN

by

A. J. Grandy

and

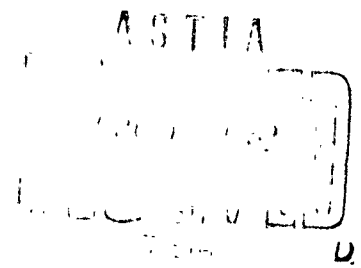
J. W. Zettel

OMS Code 5520.12.468 IO

DA Project 596-10-001

February 1962

338 000



REPORT M62-19-1



**FRANKFORD ARSENAL**

**PHILADELPHIA 37, PA**

Frankford Arsenal  
Philadelphia 37, Pa.

Memorandum Report M62-19-1  
February 1962  
OMS Code 5520.12.468 IO  
DA Project 596-10-001

DESCRIPTION AND OPERATION  
OF A HAND HELD WIRE GUN

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## OBJECT

To develop a self-energized hand held wire gun for unconventional warfare forces that will provide an effective means of capturing personnel alive, stopping riots, and erecting fast barriers in rough terrain.

## SUMMARY

↙ A hand-held version of a wire gun was designed and developed, and a sample lot <sup>was</sup> fabricated for use in controlled tests.

During limited development time the device displayed excellent operational characteristics. Further testing will be required to accurately determine adequacy against intended targets.

Complete descriptions of <sup>the</sup> design and operation of <sup>the</sup> ~~this~~ device are ~~contained in this report~~ <sup>presented</sup>.

## DESCRIPTION OF WIRE GUN

The wire gun developed for this application is intended primarily for use by individuals for short range operation against personnel encountered during riots or quelling an unruly mob. This device can also be used to sow or entangle a mass of barbed wire across narrow roads, paths, and the like. The completely assembled unit, ready for use is shown in figure 1.

The wire in this coil is a high strength rectangular steel wire which has been barbed and then wound in such a manner that it is not overstressed during the winding process. Upon release of the coil end, stored energy propels the wire out of the tube in a straight line so that the wire extends to a range of approximately 80 feet.

The complete system consists of a double action spring initiating assembly, a barbed wire coil, an outer container assembly, and an end cap with wing nut. See figure 2.

### Initiating Mechanism

The double action spring initiating assembly is composed of four main parts; the pull ring, which is a brazed steel ring, a sear rod which has an angular cut on one end, a piston which has a mating end to fit in the sear rod, and the initiating spring. Attached to the pull ring is a red aluminum tag labeled "Pull ring to Fire." In operation, the sear rod and piston are locked together by means of mating cuts in the rod ends and act as a single unit as the pull ring is retracted to fire the device. At a point when the angled cut in the sear rod is retracted clear of the container (approx. 2.0 inches), it will release and allow the spring to reverse piston direction and propel it out of the container with the connected coil end.

## Safety Assembly

The safety assembly is composed of a standard firing safety pin, a steel pull ring, and a black aluminum tag labeled "SAFETY." This safety pin, when inserted properly, gives a positive visual indication that the device is safe to handle.

## Wire Coil

The wire coil is composed of approximately 450 feet of flat, high strength, barbed steel wire. It is wound in such a manner that the wire contains energy and upon release of the coil end, releases this energy to propel the wire to a range of approximately 80 feet. The wire coil weighs 8.2 lb.

## Outer Container Assembly

The outer container is constructed of a steel cylinder and steel end cap brazed together. The cylinder is ten inches long and three and three-quarter inches in diameter. A steel holder is brazed into the end cap which houses the initiating mechanism.

## End Cap and Wing Nut

The steel end cap contains a fiber washer which seals this end from moisture. The wing nut is assembled with an "O" ring, and is threaded into the end of the piston for shipping purposes. This wing nut also acts as a double safety. It is impossible to retract the sear rod when the wing nut is in place, even if the safety pin should be removed. The total weight of metal parts is approximately 2.5 lb.

Complete details of construction are contained in appendix B.

## OPERATING INSTRUCTIONS

Wire guns supplied in the field will be available in standard T46 ammunition cans. See figure 3. Each of the four wire guns contained in a can will be packaged in a fiberboard cylinder and equipped with a canvas carry bag. See figure 4.

Upon receipt, the units should be removed from the ammunition can as illustrated in figure 5. The pull tape is removed from the shipping cylinder and the end cap lifted as shown in figure 6. The wire gun will be exposed upon removal of the packing excelsior and cardboard spacers. Complete packing arrangement within the tube is illustrated in figure 7. The wire gun can now be removed from the fiberboard cylinder as shown in figure 8.

In field use individual wire guns are carried in a canvas bag which is slung over the shoulder. The nylon belt which is supplied should be used when firing from the waist. The "PULL RING" of the firing assembly snaps onto the belt as shown in figure 9.

In order to prepare the device for firing, the end cap is removed by unscrewing the wing nut, (figures 10 and 11).

When ready to use, the safety pin is removed by pulling the ring with black tag labeled "SAFETY." (Figure 12) Three methods are suggested for initiation and operation of this device.

Figure 13 depicts the first and recommended method of firing. A nylon belt is supplied in each shipping container. The belt is worn around the user's waist and the "pull ring" of the device snaps onto it. With the device attached to the belt the gun is held securely with both hands and pulled away from the body. A force of 20 lbs. is required to retract the firing assembly two inches after which it will unlatch. Spring force will then propel the piston out of the container and expel the leading edge of the wire. The barbed wire will begin paying out, up to an approximate range of 80 feet. The gun may be guided by maneuvering the container similar to a water hose to lay wire on target. It will take approximately 6 or 7 seconds to expend the complete contents of the coil.

The second method of initiating the device is shown in figure 14. The gun is held in the crook of the left arm and actuated with the right hand.

The third method is depicted in figure 15. The device is aimed with the left hand and actuated with the right hand.

Figure 16 shows a section of wire as it would appear coming from the gun.

Notes:

1. There are no propellants or explosives used in this device. Velocity imparted to the wire is "built in" during the winding of the coil.
2. These devices are in the development stage and are not intended as fully qualified and tested equipment.
3. Each device has a serial number engraved on the end of the sear rod and is intended to be used for identification of the device in case of abnormal operation. In case of any such abnormal operation this serial number should be noted and transmitted back to the manufacturing agency.
4. Wherever possible, all used metal parts should be returned to sender for reloading.

## REFERENCES

1. A. J. Grandy, "A Proposal for the Development of a Wire Gun," Frankford Arsenal Proposal P60-5-1, June 1960.
2. Frankford Arsenal Brochure, "Barnyard Ordnance," April 1961; classified SECRET.

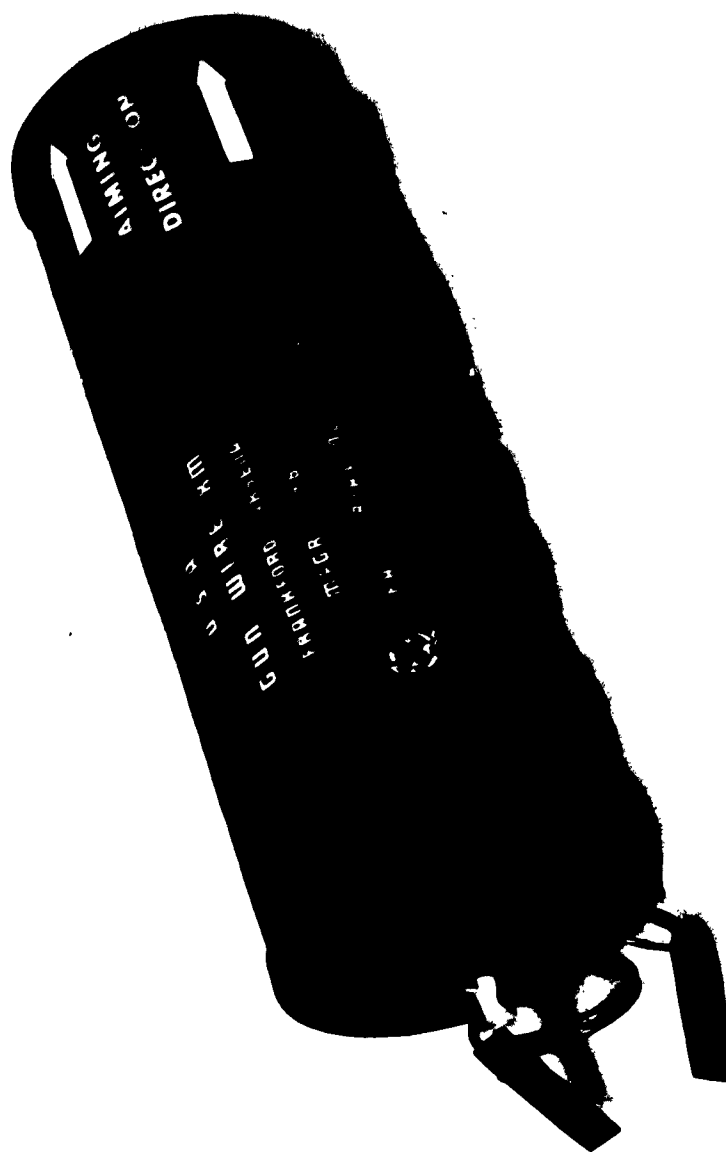
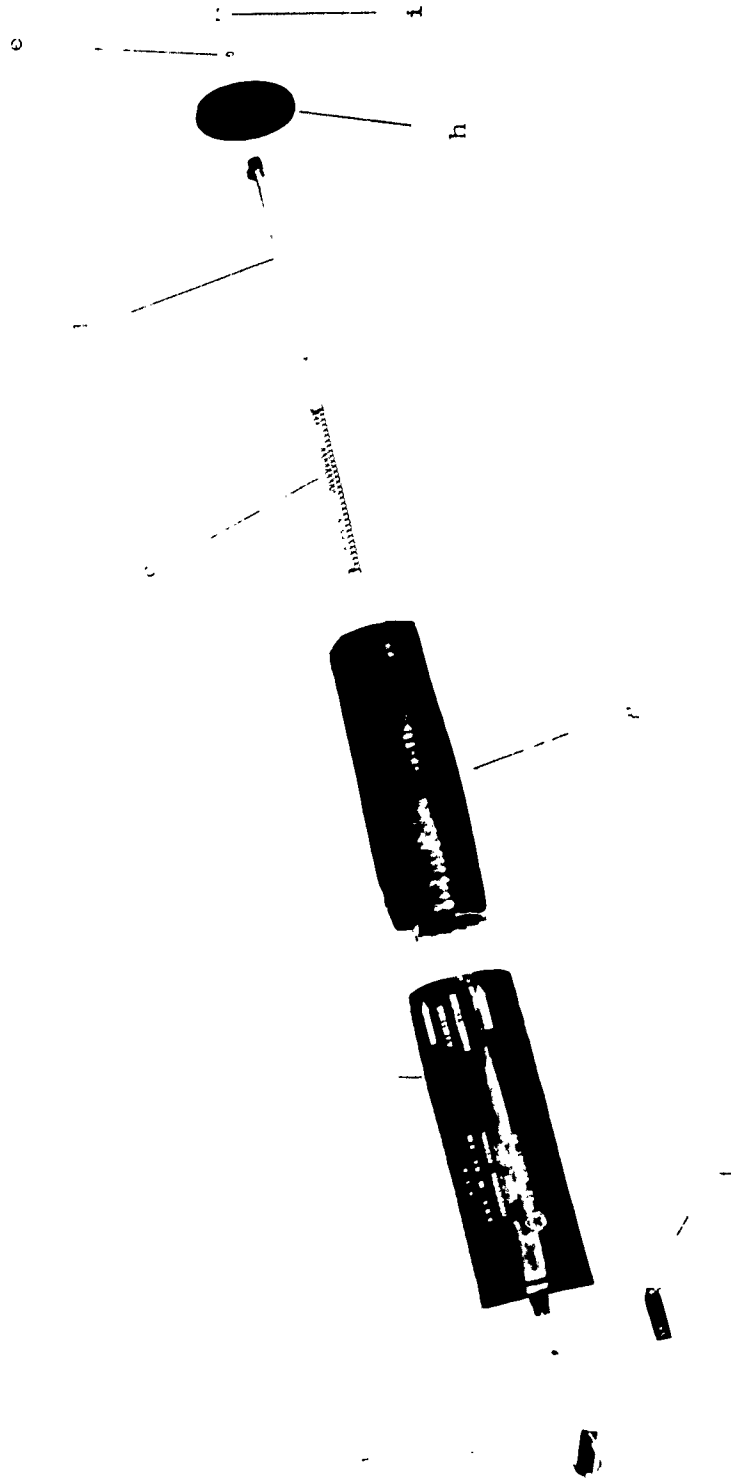


Figure 1. Gun, Wire, XM - Exterior View



a - Firing assy  
b - Outer container  
c - Spring

d - Piston  
e - "O" ring  
f - Safety assy

g - Wire coil  
h - End cap  
i - Wing nut

Figure 2. Partial Disassembly of Wire Gun



Figure 3. Side View of Wire Gun Shipping Can

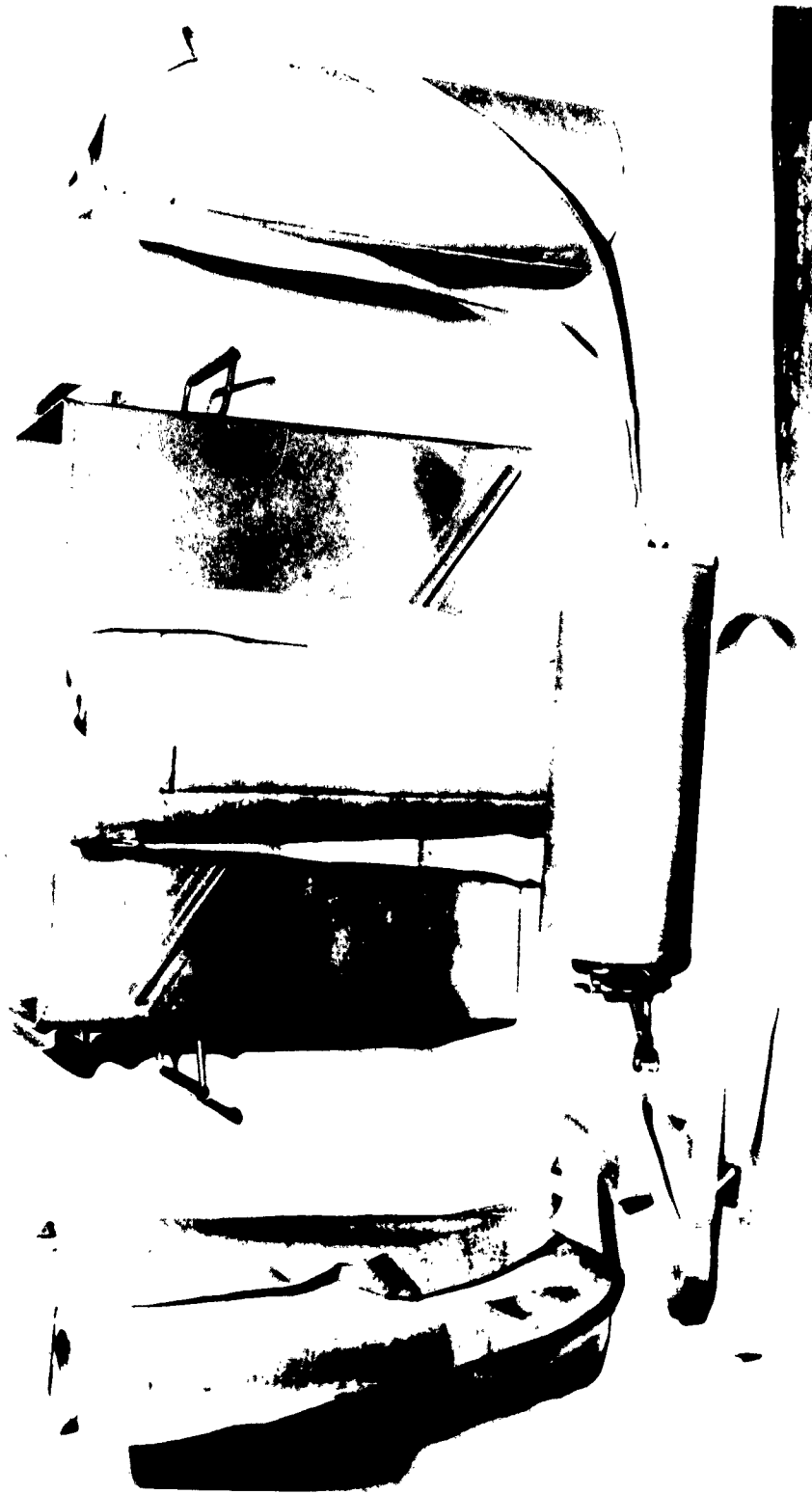


Figure 4. Four Wire Guns are Loaded in Each Shipping Can



Figure 5. Wire Gun and Carry Bag Being Removed from Shipping Can



Figure 6. Removing Cap from Cardboard Container

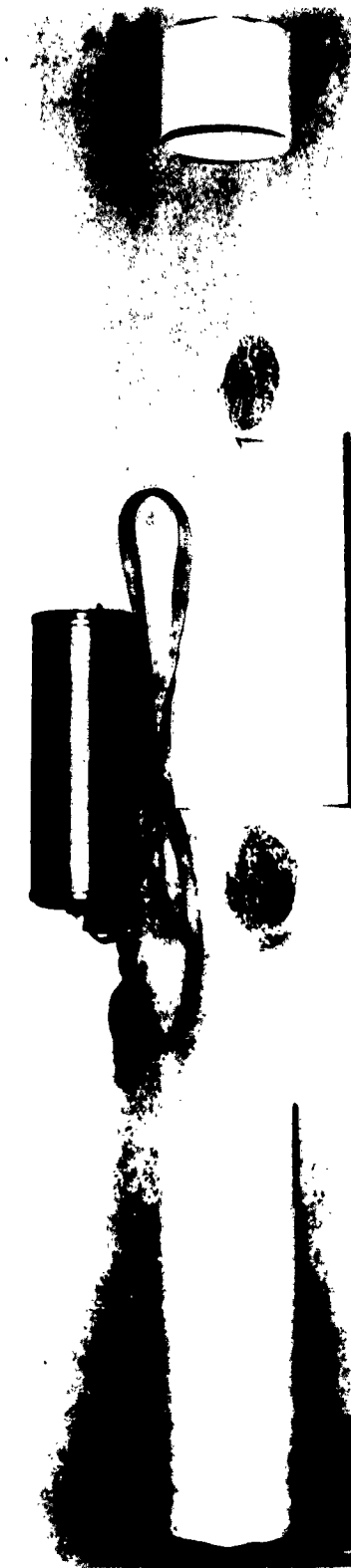


Figure 7. View of Wire Gun Packing Materials



Figure 8. Removing Wire Gun from Cardboard Container



Figure 9. Belt Attachment to Wire Gun



Figure 10. Step 1 - Unscrew Wing Nut



Figure 11. Step 2 - Remove End Cap



Figure 12. Step 3 - Remove Safety Pin



Figure 13. Belt Method of Firing Wire Gun



Figure 14. Elbow Rest Firing Position



Figure 15. Hand Held Filing Position



**Figure 16. Wire Sample After Fired From Gun**

## **APPENDIX A**

### **DEVELOPMENT OBJECTIVE**

## DEVELOPMENT OBJECTIVE

### Statement of Requirement

a. The requirement is for a coil of high strength steel wire wound in such manner that when its inner end is released it axially extends in essentially a straight line to a range of up to 100 feet using stored energy resulting from the winding process. With barbs on the wire, an antipersonnel or riot control weapon is created for field use. This wire gun will significantly increase the capabilities of unconventional warfare forces to harass the enemy and to support theatre operations.

### Materiel

#### A. Performance Required

The wire gun must be positive in action, once released it must continue to exude wire until the entire coil is expended. Configuration of the wire mass at the target must be in accordance with its designed use. For antipersonnel use the barbs must be positioned so as to hamper escape of personnel enmeshed. For riot control the wire must "ball" with open barbs so as to halt a crowd. The wire gun device must be positive, simple, and reliable for use by indigenous personnel in unconventional warfare operations. Temperature within the target area must not be a limiting factor to its effectiveness.

#### B. Description of the Desired Equipment

A wire gun similar to that developed by F. A.\* should be considered. With design modifications, it should be effective in a wide

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\*A. J. Grandy, A Proposal for the Development of a Wire Gun, Frankford Arsenal Proposal P60-5-1, June 1960.

variety of applications. The basic design consists of a seemingly harmless coil of wire. The internal energy is achieved by a special winding process. The intended use will determine the size and geometry of the wire. If sophistication is required, it will be concealed in the coil core.

#### Qualitative Characteristics

1. The device must resemble a harmless coil of wire to facilitate shipment or carry into an area of covert operations.

2. A positive and simple means of employment in the intended application must be provided. A minimum number of types are desired for multiple uses, but a family of devices is acceptable. Non-explosive devices are desired but incorporation of propellant will be acceptable if warranted by extension of range.

3. The device must be such that the source of wire cannot be determined from the expended wire.

4. Storage conditions and effective life must not be critical.

#### Operational and Organizational Concepts

1. Operational Concept - The device will provide unconventional warfare forces with an efficient means of capturing personnel alive, stopping riots, and generally reaching inaccessible positions.

2. Organizational Concept - The devices will be issued to unconventional warfare forces under the appropriate table of allowances.

3. Operational Urgency - These devices are required as early as possible, preferably within one year.

## Maintenance Concept

There shall be no maintenance required for the device in storage or in the field, during its service life.

## APPENDIX B

### DETAIL DRAWINGS

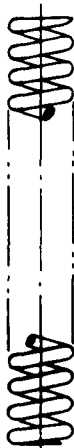
**Note:**

Detail drawings and packaging instructions located in appendixes B and C are presented **FOR INFORMATION ONLY** and should not be used for manufacturing purposes.

REVISIONS		DATE		APPROVAL	
REV	DESCRIPTION	DATE	APPROVAL	DATE	APPROVAL
1	INITIAL DESIGN				
2	REVISED DESIGN				
3	REVISED DESIGN				
4	REVISED DESIGN				
5	REVISED DESIGN				
6	REVISED DESIGN				
7	REVISED DESIGN				
8	REVISED DESIGN				
9	REVISED DESIGN				
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## SPRING DATA

MAX OD	.500	-.020
MIN ID	.380	
TO SUPPORT	23LBS $\pm$ 10% @ 3 INS.	
WIND	RIGHT HAND	
TYPE OF ENDS	CLOSED AND GRIND	
MAX SOLID HEIGHT	2.012	
WIRE DIA	.0625	
PITCH DIA	.443	
ACTIVE COILS	30	
FREE HEIGHT	6.00 $\pm$ .03	
TOTAL NO. OF COILS	32	

[illegible]

**Figure B-1. Spring**

PHYSICAL PROPERTIES		APPLICATION		FA 32228			
YP		NEXT ASSY	USED ON	REVIEWS			
TS			FA 32224				
CL 2				SYN	DESCRIPTION	DATE	APPROVAL
RA							
BN							
RH							
	DO NOT	APPLY PART NO.					
	DO	AS SPECIFIED					

NOTE:

1- MUSIC WIRE, COMP A, COLD DRAWN  
SPEC QQ-W-470

2-CADMIUM PLATE, SPEC QQ-P-416  
CLASS A (.0005 THK), TYPE I.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS ± .005 FRACTIONS ± 1/64 ANGLES ± 1°	ORIGINAL DATE OF DRAWING 2-9-62	PIN SAFETY	R & D GT20 11 ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD ARSENAL FRANKFURT
	DRAWNMAN JVA		
	CHECKER JME		
	TRACER		
MATERIAL SEE NOTE 1 HEAT TREATMENT FINAL PROTECTIVE FINISH SEE NOTE 2	SUBMITTED <i>O. J. Gandy</i> ORDNANCE CORPS	APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORDNANCE CORPS	DWS SIZE A FA 32228

Figure B-2. Pin, Safety

PARTIAL SPECIFICATION		APPLICATION		FA 32199			
ITEM	REV	REV	REV	REVISIONS			
1				SYN	DESCRIPTION	DATE	APPROVAL
2							
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MATERIAL : 16 GA ALUM (2024-T3)  
 LETTERS : LUSTERLESS WHITE NO. 37886,  
 FED. STD NO. 595. SPEC TT-I-558  
 OVER BLACK BACKGROUND (BOTH SIDES)

DIMENSIONS SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS _____ FRACTIONS _____ ANGLES _____ MATERIAL SEE NOTE HEAT TREATMENT FINAL PROTECTIVE FINISH	ORIGINAL DATE OF DRAWING 2-7-62 DESIGNED J.V.F. CHECKED J.M.F. TROGER CHECKER ENGINEER DRAWN SUBMITTED  ORG CORPS APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORG CORPS	TAB, SAFETY SCALE 1:1 UNIT WT	R & D GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. ARSENAL FRANKFORD DWS SIZE A FA32199
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Figure B-3. Tab, Safety

PROPERTIES		APPLICATION		FA 32226			
YP		NEXT ASSY	USED ON	REVISIONS			
TS			FC11303				
EL 2				SYM	DESCRIPTION	DATE	APPROVAL
RA							
BN							
RH		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

U.S.A.  
GUN, WIRE, XM  
FRANKFORD ARSENAL  
MEGR. 1961  
FA SERIAL NO.

3  
1 1/32  
2 13/16  
9/32

OLIVE DRAB  
YELLOW LETTERS

SOURCE: NATIONAL DECALCOMANIA CO.  
236-40 N. 60TH ST  
PHILA. PA. OR EQUIVALENT

YELLOW  
OLIVE DRAB LETTERS

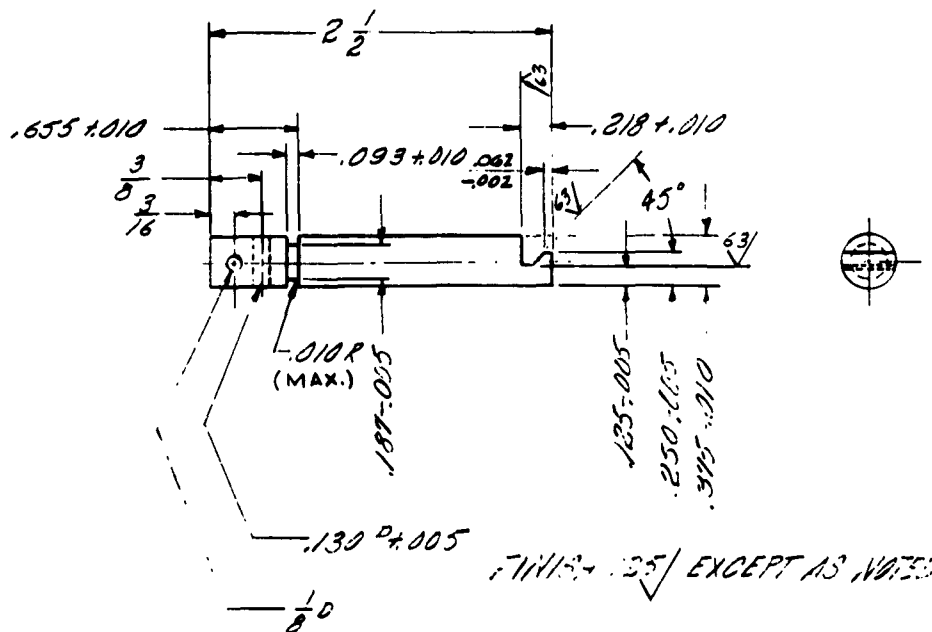
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON-	ORIGINAL DATE OF DRAWING 2-12-62	DECAL, IDENTIFICATION	R&D GROUP	
DECIMALS	DRAFTSMAN JPV CHECKER JMF		ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORDNANCE FRANKFORD	
FRACTIONS	TRACER			
ANGLES	ENGINEER			
MATERIAL	ENGINEER			
HEAT TREATMENT	SUBMITTED		DWG SIZE A	
FINAL PROTECTIVE FINISH	APPROVED BY ORDER OF THE CHIEF OF ORDNANCE		FA32226	

SCALE 1/1 UNIT WT

Figure B-4. Decal, Identification

PHYSICAL PROPERTIES		APPLICATION		FA 32122			
YP		NEXT ASSY	USED ON				
TS			FA 32218	REVISIONS			
EL 2				SYM	DESCRIPTION	DATE	APPROVAL
RA							
BH							
RH							
		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

NOTE:- BREAK ALL SHARP CORNERS



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS FRACTIONS $\pm 1/64$ ANGLES $\pm 30'$ MATERIAL: ALUMINUM (2024 T4) SPEC 3-A-1 HEAT TREATMENT FINAL PROTECTIVE FINISH	ORIGINAL DATE OF DRAWING 2-9-62 DESIGNED JEF TRACER JEF ENGINEER JEF SUBMITTED APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORG CORPS	3' E 4' 8"	RD GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORDN. ARSENAL FRANKFORD DWS SIZE A FA 32122

ARMY-NAVY ORDNANCE TRUST, NEWTON, NJ 07110

Figure B-5. Sear

GENERAL INFORMATION		APPLICATION		AFA 32310			
YP		TEXT ASBY	USED ON	REVISIONS			
TS			FA 32218	SYN	DESCRIPTION	DATE	APPROVAL
EL 2							
BA							
BN							
RN		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

1.40 +.04

$\frac{1}{16}$  WHEN SPRING IS COMPRESSED TO 1.34 O.D.

ZINC PLATE, CHROMATE DIP, TYPE 1, CLASS RSC, SPEC 57-0-2. TO BE GIVEN A DEHYDROGENATION BAKE AT 350° TO 400°F FOR 1 HOUR AFTER PLATING AND BEFORE CHROMATING.

DIMENSION SPECIFICATIONS DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS _____ FRACTIONS $\pm \frac{1}{64}$ ANGLES _____ MATERIAL MUSIC WIRE, TYPE A, QQ-W-479 USE DIA. HEAT TREATMENT _____ FINAL PROTECTIVE FINISH SEE NOTE	ORIGINAL DATE OF DRAWING 14 Feb 62 DESIGNED BY _____ TRACER _____ ENGINEER _____ SUBMITTED _____ APPROVED BY ORDER OF THE CHIEF OF ORDNANCE _____ ORD CORPS	RING	R & D GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORG. ARSENAL FRANKFORD Dwg SIZE A FA 32310 SHEET 1 of 1
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SCALE 2:1

Figure B-6. Ring

GENERAL PROPERTIES		APPLICATION		FA 53759			
TP		WET ASSY	USED ON	REVISIONS			
TS			FA 32217				
EL 2				SYN	DESCRIPTION	DATE	APPROVAL
RA							
DN							
DN							
DN		DO NOT	APPLY PART NO.				
DN		DO	AS SPECIFIED				

.500  $\pm$  .005  
 .380  $\pm$  .010  
 4  
 63  
 .093  $\pm$  .005  
 AT ASS'Y  
 125 /  
 MACHINE FINISH EXCEPT AS NOTED  
 BREAK ALL SHARP EDGES.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS — FRACTIONS $\pm \frac{1}{64}$ ANGLES —	ORIGINAL DATE OF DRAWING 2-6-62 DESIGNED J.F.K. CHECKED J.M.F. TRACER — CHECKED — ENGINEER — ENGINEER —	R&D GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD AREA FRANKFORD
MATERIAL STEEL, FC 1020 HEAT TREATMENT — FINAL PROTECTIVE FINISH	SUBMITTED <i>O.J. Grand</i> ORD CORPS APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORD CORPS	

HOLDER  
 SCALE 1:1  
 DWG SIZE A  
 FA 53759

Figure B-7. Holder

PHYSICAL PROPERTIES		APPLICATION		FA 32219			
YP		NEXT ASST	USED ON				
TS			FB 53790				
EL 2				REVISIONS			
RA				SYM	DESCRIPTION	DATE	APPROVAL
ON							
RH							
		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

— BEND

—  $.380^{+0.010}_0$  —  $\frac{7}{16} R \text{ MIN}$

REMOVE BURRS AND CHAMFER EDGES

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS _____ FRACTIONS _____ ANGLES _____	ORIGINAL DATE OF DRAWING 2-9-62	WASHER MODIFIED	240 92001 ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY JRD. ARSENAL FRANKFORD	
	DRAFTER _____ TRACER _____ ENGINEER _____ SUBMITTED _____ APPROVED BY ORDER OF THE CHIEF OF ORDNANCE _____ ORDN CORPS			
	MATERIAL STEEL (F31020)			
	HEAT TREATMENT _____ FINAL PROTECTIVE FINISH _____			

SCALE 2:1  
 DWG SIZE A

UNIT WT

ARMT-AMSTAN ARSENAL (ORPES), DETROIT, MI 48211-09

Figure B-8. Washer, Modified

APPROVAL		APPLICATION		FA 32218			
YP	PROPERTY	NEXT ASSY	USED ON	REVISIONS			
TS		FB 53790		SYN	DESCRIPTION	DATE	APPROVAL
EL 2							
RA							
BH							
RH							
		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

<p><b>UNLESS OTHERWISE SPECIFIED</b> DIMENSIONS ARE IN INCHES <b>TOLERANCES ON-</b></p> <p>DECIMALS _____</p> <p>FRACTIONS _____</p> <p>ANGLES _____</p> <p><b>MATERIAL</b> _____</p> <p><b>HEAT TREATMENT</b> _____</p> <p><b>FINAL PROTECTIVE FINISH</b> _____</p>	<p><b>ORIGINAL DATE OF DRAWING</b> 2-9-62</p> <p><b>REVISION</b> 211 <b>REASON</b> LTF</p> <p><b>DESIGNED</b> _____ <b>CHECKED</b> _____</p> <p><b>ENGINEER</b> _____ <b>REVIEWED</b> _____</p> <p><b>SUBMITTED</b> <i>O. J. Yeand</i> ORD CORPS</p> <p><b>APPROVED BY ORDER OF THE CHIEF OF ORDNANCE</b> _____</p> <p>ORD CORPS</p>	<p style="font-size: 1.5em;">SEAR ASS'Y</p>	<p><b>R&amp;D GROUP</b></p> <p><b>ORDNANCE CORPS</b></p> <p><b>DEPT OF THE ARMY</b></p>
		<p><b>SCALE</b> 1:1</p>	<p><b>FA32218</b></p>

Figure B-9. Sear, Ass'y

GENERAL PROPERTIES		APPLICATION		FA 32220			
YP		NEXT ASSY	USED ON	REVISIONS			
TS			FB 33790	SYN	DESCRIPTION	DATE	APPROVAL
EL 2							
RA							
BN							
BN							
RN		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS — FRACTIONS — ANGLES ± 30°	ORIGINAL DATE OF DRAWING FEB. 9, 1962 DESIGNED BY JEF CHECKED JMF TRACER CHECKER ENGINEER ENGINEER	BUSHING	R & D GROUP ORDANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. ARSENAL FRANKFORD
MATERIAL RUBBER MIL-R-3065 HEAT TREATMENT FINAL PROTECTIVE FINISH NATURAL BLACK	SUBMITTED APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORD CORPS		DWS DIZ A FA 32220

SCALE 2:1

Figure F-10. Bushing

GENERAL PROPERTIES		APPLICATION		FA 32227			
YP		NEXT ASSY	USED ON	REVISIONS			
TS			FC 11303				
EL 2				SYN	DESCRIPTION	DATE	APPROVAL
RA							
ON							
IN		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

SOURCE: NATIONAL DECALCOMANIA CO.  
236-40 N. 60TH ST  
PHILA., PA. OR EQUIVALENT

4

1 1/2

3/32

5/32

11/32

3/8

7-EQUALLY SPACED AROUND 3 5/8 DIA.

3/16 LETTERS YELLOW LETTERS AND ARROWS ON A OLIVE DRAB. BACKGROUND

YELLOW LETTERS

AIMING

DIRECTION

WARNING DANGEROUS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON—	ORIGINAL DATE OF DRAWING 2-12-6V	DECAL, FIRING	RD GROUP	
DECIMALS _____	DESIGNED JVF			ENGINEER JMF
FRACTIONS _____	TRACER _____			ENGINEER _____
ANGLES _____	ENGINEER _____			ENGINEER _____
MATERIAL _____	SUBMITTED	ORD CORPS	ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. ARSENAL FRANKFORD	
HEAT TREATMENT _____	APPROVED			
FINAL PROTECTIVE FINISH _____	CHIEF OF ORDNANCE			

SCALE 1" = 1"

DDG SIZE A FA 32227

Figure B-11. Decal, Firing

PHYSICAL PROPERTIES		APPLICATION		FA 32224			
YP		NEXT ASSY	USED ON	REVISIONS			
TS		FD2319/		SYM	DESCRIPTION	DATE	APPROVAL
EL 2							
RA							
BH							
RH		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

TAB, SAFETY FA 32199 ✓

RING, SAFETY FA 32225 ✓

PIN, SAFETY FA 32228 ✓

SAFETY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS _____ FRACTIONS _____ ANGLES _____ MATERIAL _____ HEAT TREATMENT _____ FINAL PROTECTIVE FINISH _____	ORIGINAL DATE OF DRAWING 2-12-62 DESIGNED JAV CHECKED JMF TRACER _____ CHECKER _____ ENGINEER _____ ENGINEER _____ SUBMITTED <i>[Signature]</i> APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORD CORPS	SAFETY PIN ASS'Y SCALE 1:1 UNIT WT _____	R&D GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. ARSENAL FRANKFORD DWS SIZE A FA32224

Figure B-12. Safety Pin, Ass'y

PHYSICAL PROPERTIES		APPLICATION		FA 32225			
YP		NEXT ASSY	USED ON	REVISIONS			
TS			FA 32224				
EL 2				SYM	DESCRIPTION	DATE	APPROVAL
RA							
BH							
RH							
		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

1.000 -0.015

.050

WIND RIGHT HAND  
WIRE DIA. .045  
TOTAL NO. OF COILS 1 1/2

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS .005 FRACTIONS — ANGLES —	ORIGINAL DATE OF DRAWING 2-14-62	RING, SAFETY	R&D GROUP ORDNANCE CORPS DEPT OF THE ARMY 100 ARMY ORD. ARSENAL FRAN-F-100	
	DRAFTSMAN — TRACER — ENGINEER —			CHECKED JMF CHECKER — ENGINEER —
	SUBMITTED <i>C. J. Gandy</i> ORD CORPS			
	APPROVED BY ORDER OF THE CHIEF OF ORDNANCE			
MATERIAL ALUMINUM 6061-T6	SCALE 2:1	DWG SIZE A	FA32225	
HEAT TREATMENT T6	SHEET 1 OF 1	ARMY-ORDNANCE RECORDING INSTRUCTIONS, DETACHMENT, 12-17-1100		
FINAL PROTECTIVE FINISH ANODIZE				

Figure B-13. Ring, Safety

GENERAL PROPERTIES		APPLICATION		FA 32223			
YP		NEXT ASSY	USED ON	REVISIONS			
TS			FA 32221				
EL 2				SYN	DESCRIPTION	DATE	APPROVAL
RA							
BN							
RH		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

GASKET MAT'L, NON-METALLIC, MIL-G-12803

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON- DECIMALS _____ FRACTIONS _____ ANGLES _____ MATERIAL SEE NOTE HEAT TREATMENT FINAL PROTECTIVE FINISH	ORIGINAL DATE OF DRAWING 2-6-62 DRAFTSMAN JFF CHECKER JAF TRACER _____ ENGINEER _____ SUBMITTED <i>[Signature]</i> APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORD CORPS	GASKET SCALE 1:1 UNIT WT _____	RID GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. ARSENAL WZANKFORD DWS SIZE A FA 32223 SHEET OF
--	--	--------------------------------------	--

Figure B-14. Gasket

GENERAL INFORMATION		APPLICATION		FA 32221			
TP		NEXT ASSY	USED ON	REVISIONS			
TS		FD 25191					
EL 2				SYN	DESCRIPTION	DATE	APPROVAL
RA							
BN							
RN		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

GASKET, FA 32223

CAP, FA 32222

CEMENT IN PLACE WITH MIL-C-13792(ORD)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS _____ FRACTIONS _____ ANGLES _____	ORIGINAL DATE OF DRAWING 2-9-62 DESIGNED BY J.F. ENGLISH/JMF TRACED BY _____ ENGINEER _____ CHECKED BY _____	CAP, ASS'Y	R & D GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. ARSENAL FRANKFORD
	SUBMITTED BY <i>O. J. Gandy</i> APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORN CORPS		
MATERIAL _____ HEAT TREATMENT _____ FINAL PROTECTIVE FINISH _____	SCALE 1:1 UNIT _____		

ARMY-ORDNANCE GENERAL CORPUS, DETROIT, MI 482-1100

Figure B-15. Cap, Ass'y

MATERIAL PROPERTIES		APPLICATION		FA 32222			
YP	TEST BODY	USED ON	REVISIONS				
TE		FA 32217					
EL 2			QTN	DESCRIPTION	DATE	APPROVAL	
RA							
BN							
BN							
	DO NOT	APPLY PART NO.					
	DO	AS SPECIFIED					

NOTE:- BREAK ALL SHARP CORNERS

FINISH 125/ ALL OVER

BEND RADIUS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS $\pm .005$ FRACTIONS $\pm 1/64$ ANGLES		ORIGINAL DATE OF DRAWING 2-9-62 DESIGNED BY JMF TRACED BY JMF CHECKED BY JMF SUBMITTED BY JMF	CAP, END	R & D GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. ARSENAL FRANKFORD
MATERIAL STEEL 1020 (OR EQUIV) HEAT TREATMENT FINAL PROTECTIVE FINISH	APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORN CORPS	SCALE 1:1 UNIT WT		DOW SIDE A FA32222

Figure B-16. Cap, End

GENERAL PROPERTIES		APPLICATION		AFA32198																											
VP		NEXT ASSY	USED ON	<div style="text-align: right; margin-bottom: 10px;"> <math>\frac{1}{8}</math> D. </div>																											
TS		AFA3218																													
EL 2																															
RA																															
BN																															
BN				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4" style="text-align: center;">REVISIONS</th> </tr> <tr> <th style="width: 10%;">SYN</th> <th style="width: 50%;">DESCRIPTION</th> <th style="width: 20%;">DATE</th> <th style="width: 20%;">APPROVAL</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table>				REVISIONS				SYN	DESCRIPTION	DATE	APPROVAL																
REVISIONS																															
SYN	DESCRIPTION	DATE	APPROVAL																												
		DO NOT APPLY PART NO.																													
		DO AS SPECIFIED																													

MATERIAL: 16 GA ALUM (2024 - T3)

LETTERS, LUSTERLESS WHITE # 37886, FED STD # 595,

SPEC TT-I-558 OVER RED BACKGROUND

(BOTH SIDES)

<p><small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON-</small></p> <p>DECIMALS .0005</p> <p>FRACTIONS 1/64</p> <p>ANGLES .0005</p>	<p><small>ORIGINAL DATE OF DRAWING</small> 2-9-62</p> <p><small>DRAWN BY</small> JFV <small>CHECKED</small> JMF</p> <p><small>TRACER</small> <small>CHECKED</small></p> <p><small>ENGINEER</small> <small>ENGINEER</small></p>	<p style="font-size: 1.2em;">TAB, FIRING</p>	<p style="text-align: center;">R &amp; D GROUP</p> <p style="text-align: center;">ORDNANCE CORPS</p> <p style="text-align: center;">DEPT OF THE ARMY</p> <p style="text-align: center;">U.S. ARMY ORD. ARSENAL</p> <p style="text-align: center;">FRANKFORD</p>
<p><small>MATERIAL</small></p> <p>16 GA ALUM.</p> <p><small>HEAT TREATMENT</small></p> <p> </p> <p><small>FINAL PROTECTIVE FINISH</small></p> <p> </p>	<p><small>SUBMITTED</small></p> <p style="font-size: 1.2em; text-align: center;">A. J. Grady</p> <p style="text-align: center;"><small>ORD CORPS</small></p> <p><small>APPROVED BY ORDER OF THE CHIEF OF ORDNANCE</small></p> <p style="text-align: center;"><small>ORD CORPS</small></p>	<p><small>SCALE</small> 1:1</p> <p><small>UNIT</small> IN</p>	<p><small>DWG SIZE</small></p> <p style="font-size: 1.5em; text-align: center;">A</p> <p style="font-size: 1.5em; text-align: center;">FA32198</p>

Figure B-17. Tab, Firing

PHYSICAL PROPERTIES		APPLICATION		FA 32217			
YP		NEXT ASSY	USED ON	REVISIONS			
TS		FA 53786		BYN	DESCRIPTION	DATE	APPROVAL
EL 2							
RA							
BN							
RH		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

MAINTAIN AT ASS'Y

CAP, FB53757

SILVER BRAZE  
IN ACCORDANCE WITH MIL-5-7883

HOLDER, FB53759

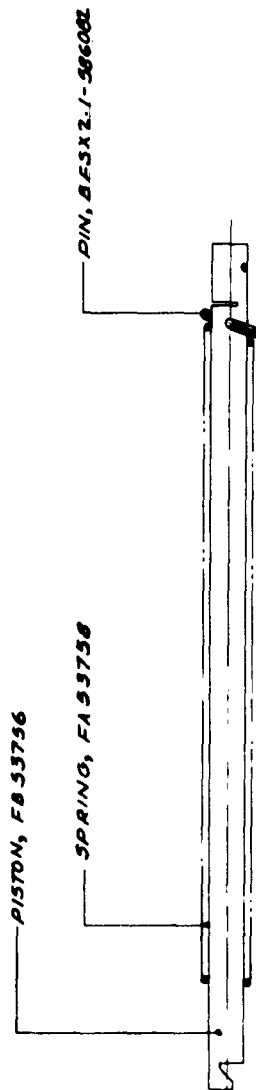
SOURCE : AMERICAN CHAIN & CABLE CO.  
AUTOMOTIVE & AIRCRAFT DIVISION  
ADRAIN, MICH OR EQUIVALENT

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON—		ORIGINAL DATE OF DRAWING 2-9-62		CAP & HOLDER ASS'Y		R&D GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. ARSENA FRANKFORD	
DECIMALS		DRAWN J.V.F.	CHECKED J.W.F.				
FRACTIONS		TRACER	CHECKER				
ANGLES		ENGINEER	ENGINEER				
MATERIAL		SIGNED <i>A. J. Green</i> ORD CORPS		FA32217		A	
HEAT TREATMENT		APPROVED BY ORDER OF THE CHIEF OF ORDNANCE					
FINAL PROTECTIVE FINISH		ORD CORPS					

SCALE 1:1

Figure B-18. Cap & Holder Ass'y

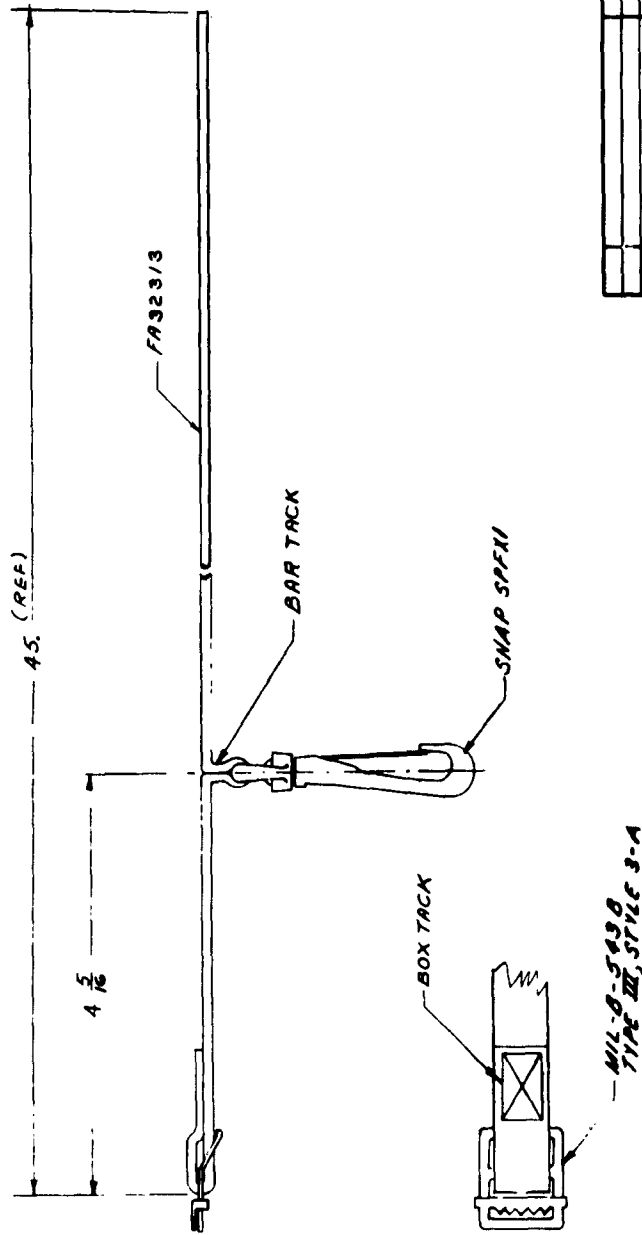
11740-0



GENERAL PRESENTATION		TOLERANCES ON DIMENSIONS		DATE		R1D GROUP	
1		FORM		DATE		ORDNANCE CORPS	
2		MATERIAL		DATE		DEPT OF THE ARMY	
3		HEAT TREATMENT		DATE		U.S. ARMY, PERS. GENERAL	
4		FINAL PROTECTIVE FINISH		DATE		FB 53756	
5		DO NOT		DATE		B	
6		APPLICATION		DATE		FB 53756	
7		APPLY PART NO.		DATE		FB 53756	
8		AS SHOWN		DATE		FB 53756	
9				DATE		FB 53756	
10				DATE		FB 53756	
11				DATE		FB 53756	
12				DATE		FB 53756	
13				DATE		FB 53756	
14				DATE		FB 53756	
15				DATE		FB 53756	
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18				DATE		FB 53756	
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26				DATE		FB 53756	
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97				DATE		FB 53756	
98				DATE		FB 53756	
99				DATE		FB 53756	
100				DATE		FB 53756	

Figure B-19. Piston & Spring Ass'y

11750-2



PARTIAL 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		R10 GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORDNANCE EXAMINED B FB53742 1 1 1	
WIRE GUN BELT ASS'Y SCALE 1:1 UNIT WT		FEB 20/30 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	
TOLERANCES ON DIMS FRACTIONS DECIMALS 1/16 0.0625 1/8 0.125 1/4 0.25 3/8 0.375 1/2 0.5 3/4 0.75 1 1.0 1 1/2 1.5 2 2.0 3 3.0 4 4.0 5 5.0 6 6.0 8 8.0 10 10.0 12 12.0 14 14.0 16 16.0 18 18.0 20 20.0 24 24.0 28 28.0 32 32.0 36 36.0 40 40.0 48 48.0 56 56.0 64 64.0 72 72.0 80 80.0 96 96.0 100 100.0		HEAT TREATMENT FINAL PROTECTIVE FINISH 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	
APPLICATION APPLY PARTIAL 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100		11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	

Figure B-20. Wire Gun Belt Ass'y

1175 1175-3

SOURCE: AMERICAN CABLE CO. AUTOMOTIVE AND AIRCRAFT DIVISION ADRAIN, MICH OR EQUIVALENT.	
DATE	2-9-62
BY	FA 32217
CHKD	FA 32217
APP'D	FA 32217
REV	FA 32217
DO NOT	DO NOT
APPLICATION	APPLICATION
APPLY PART NO.	APPLY PART NO.
AS ORDERED	AS ORDERED

TOLERANCES ON DIMENSIONS		DATE	
FRACTIONAL	DECIMAL	DATE	DATE
1/16	0.0625	2-9-62	2-9-62
1/32	0.0312		
3/64	0.0156		
1/8	0.1250		
1/4	0.2500		
3/8	0.3750		
1/2	0.5000		
3/4	0.7500		
1	1.0000		

TUBE & CAP ASSY		SCALE 1:1		UNIT WT 14.0056	
R&D GROUP		ORDNANCE CORPS		DEPT OF THE ARMY	
U.S. ARMY ORD. ARSENAL		FRANKFORD		FB 53786	
B		B		FB 53786	
1		1		1	

Figure B-21. Tube & Cap Ass'y



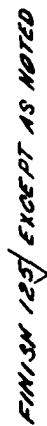
**Figure B-22. Tube**

**Figure B-23. Tube & Sear Assy**

SOURCE AMERICAN CHAIN AND CABLE CO.  
AUTOMOTIVE AND AIRCRAFT DIVISION  
ADRAIN, MICH OR EQUIVALENT.

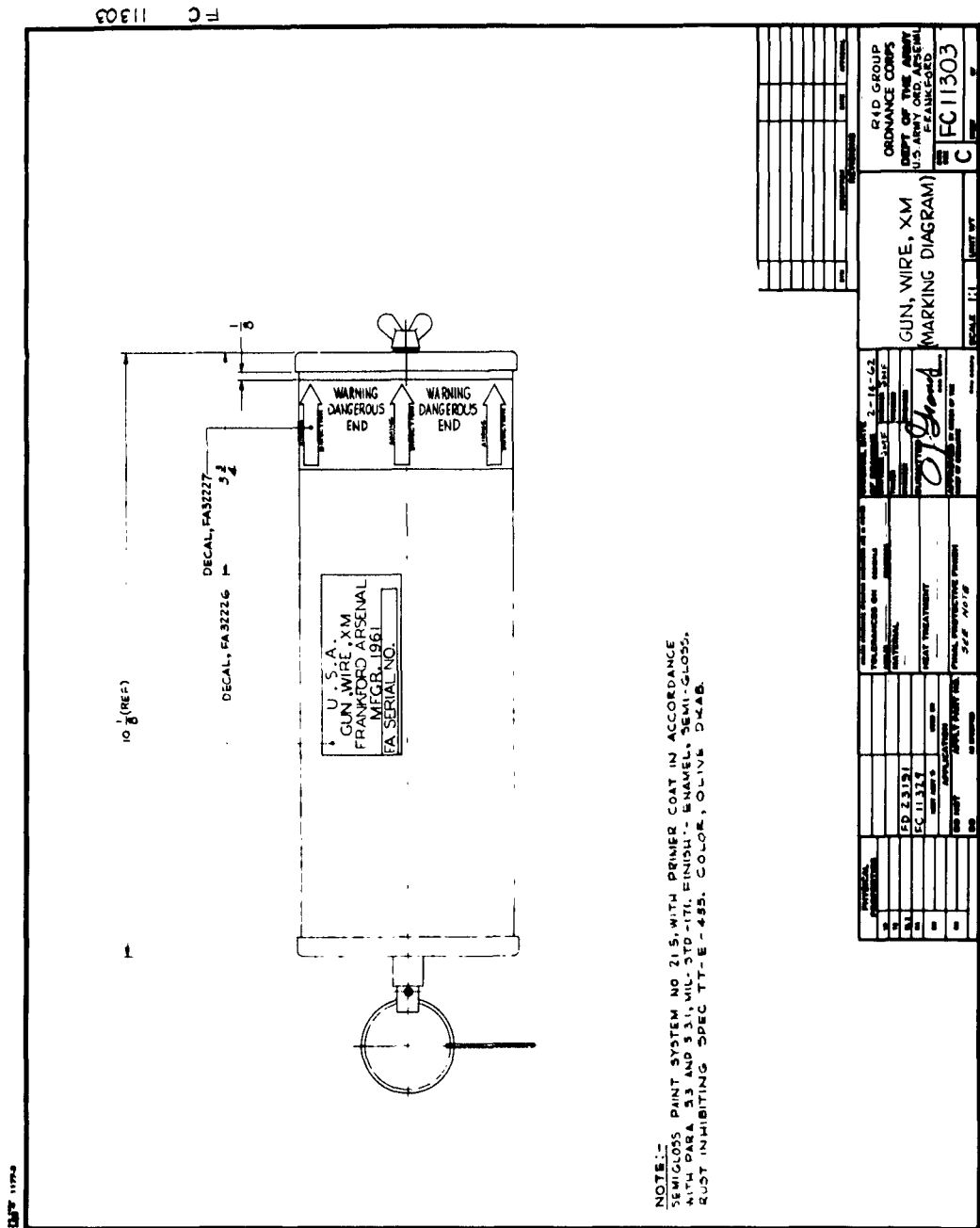
[illegible]

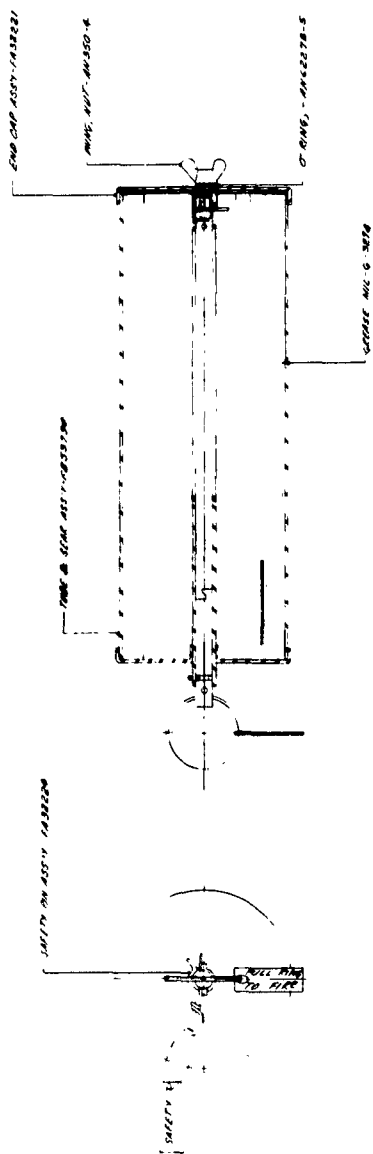
**Figure B-24. Coil Ass'y**



**Figure B-25. Piston**





[illegible]

**Figure B-28. Gun, Wire, XM Ass'y**

## **APPENDIX C**

### **PACKAGING DETAILS**

PROPERTIES		APPLICATION		FA 32311			
YP	TS	NEXT ASSY	USED ON	REVISIONS			
			FC 11329				
EL 2				SYN	DESCRIPTION	DATE	APPROVAL
RA							
BH							
RH							
		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

MATERIAL: 1/8 THICK SOLID FIBERBOARD  
 OR COMMERCIAL CHIPBOARD  
SOURCE: WHITEMARSH CONVERTERS INC.  
 COTTMAN ST. AND HASBROOK AV.  
 PHILADELPHIA 11, PA. OR EQUIVALENT.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON— DECIMALS — FRACTIONS — ANGLES —	ORIGINAL DATE OF DRAWING 16 FEB 62 DESIGNED JTF TRACER ENGINEER SUBMITTED  ORG CORPS APPROVED BY ORDER OF THE CHIEF OF ORDNANCE ORG CORPS	FILLER	R&D GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. ARS. FRANKFORD DWG SIZE A FA 32311
---	---	--------	---

Figure C-1. Filler

PHYSICAL PROPERTIES		APPLICATION		FA 32312			
YP		NEXT ASSY	USED ON	REVISIONS			
TS			FC11329				
EL 2				SYN	DESCRIPTION	DATE	APPROVAL
RA							
BH							
BH							
		DO NOT	APPLY PART NO.				
		DO	AS SPECIFIED				

NOTE -  
MATERIAL - CUSHIONING MATERIAL, BOND  
FIBER MIL - C - 7769

<p><small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON-</small></p> <p>DECIMALS —</p> <p>FRACTIONS —</p> <p>ANGLES —</p> <p>MATERIAL <b>SEE NOTE</b></p> <p>HEAT TREATMENT —</p> <p>FINAL PROTECTIVE FINISH —</p>	<p>ORIGINAL DATE OF DRAWING <b>19 Feb 62</b></p> <p>DRAWN BY <b>JAP</b> CHECKED <b>JAL</b></p> <p>TRACER — CHECKER —</p> <p>ENGINEER — ENGINEER —</p> <p>SUBMITTED <b>O. J. Gurnea</b> <small>ORD CORPS</small></p> <p>APPROVED BY ORDER OF THE CHIEF OF ORDNANCE</p> <p style="text-align: right;"><small>ORD CORPS</small></p>	<p style="font-size: 1.5em;">CUSHION BOND</p> <p>SCALE <b>1:1</b> UNIT <b>WT</b></p>	<p style="text-align: right;">R &amp; D GROUP</p> <p style="text-align: center;">ORDNANCE CORPS DEPT OF THE ARMY US ARMY PAPERWORK PRACTICE</p> <p>DOC SIZE <b>FA 32312</b></p> <p style="text-align: right;">SHEET <b>1</b> OF <b>1</b></p>
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Figure C-2. Cushion Bond

**NOTES.** - When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have furnished, furnished, or in any way supplied the said drawings, specifications or other data is not to be regarded by implication or otherwise as in any manner endorsing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

PHYSICAL PROPERTIES		DO NOT DO	APPLY PART NO. AS SPECIFIED	REVISIONS			
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TS		NEXT ASSY	USED ON				
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RA							
BM							
RM							

48.

9/16

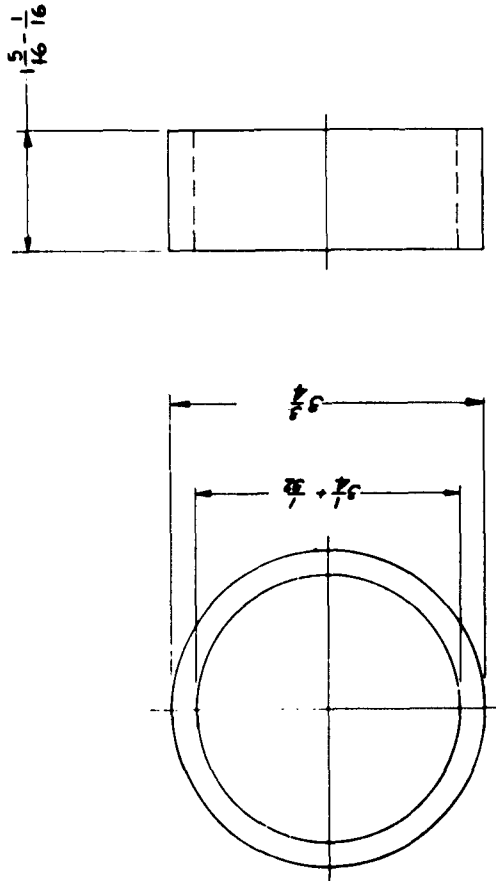
*MELT BOTH ENDS WITH HEATING ELEMENT FOR DESIRED LENGTH.*

UNLESS OTHERWISE SPECIFIED	ORIGINAL DATE OF DRAWING <b>FEB 20 1963</b>	<b>WEB, GUN, WIRE</b>	<b>RID GROUP ORDNANCE CORPS DEPT OF THE ARMY U.S. ARMY ORD. FRANKFORD</b>
DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES <b>5/16</b>	DATE <b>SEP 11 1963</b>		
MATERIAL <b>NIL-W-5625D COLOR O.D. NYLON</b>	TRACER <b>SEP 11 1963</b>		
HEAT TREATMENT	SIZE <b>SEP 11 1963</b>		
FINAL PROTECTIVE FINISH	SUBMITTED <i>A. J. Gandy</i> O.D. CORPS	SCALE <b>1:1</b>	FA 32313
	APPROVED BY ORDER OF THE CHIEF OF ORDNANCE O.D. CORPS	UNIT WT	SHEET <b>1</b> OF <b>1</b>

DD FORM 1 APR 64

ARMY-AMMUNITION GENERAL DRAWING OFFICE, ST. LOUIS

Figure C-3. Web, Gun, Wire



SOURCE : PHILADELPHIA CONTAINER CO.  
SWANSON ST. AND OREGON AV.  
PHILADELPHIA, PA. OR EQUIVALENT

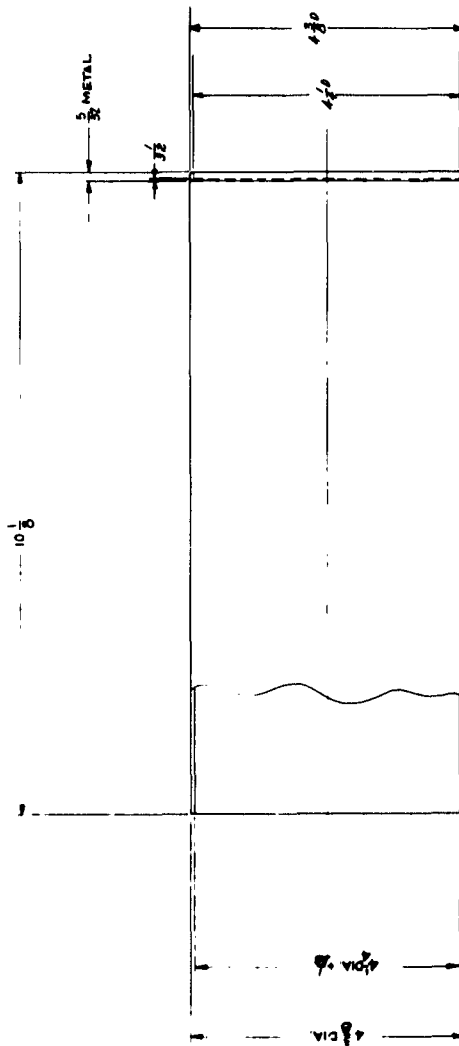
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100										
SOURCE: PHILADELPHIA CONTAINER CO. SWANSON ST. AND OREGON AV. PHILADELPHIA, PA. OR EQUIVALENT										1. NAME: [REDACTED] 2. ADDRESS: [REDACTED] 3. CITY: [REDACTED] 4. STATE: [REDACTED] 5. ZIP: [REDACTED] 6. PHONE: [REDACTED] 7. FAX: [REDACTED] 8. E-MAIL: [REDACTED] 9. WEBSITE: [REDACTED] 10. OTHER: [REDACTED]										11. DATE OF BIRTH: [REDACTED] 12. DATE OF DEATH: [REDACTED] 13. DATE OF ENTRY: [REDACTED] 14. DATE OF EXIT: [REDACTED] 15. DATE OF REENTRY: [REDACTED] 16. DATE OF REEXIT: [REDACTED] 17. DATE OF REENTRY: [REDACTED] 18. DATE OF REEXIT: [REDACTED] 19. DATE OF REENTRY: [REDACTED] 20. DATE OF REEXIT: [REDACTED]										21. NAME: [REDACTED] 22. ADDRESS: [REDACTED] 23. CITY: [REDACTED] 24. STATE: [REDACTED] 25. ZIP: [REDACTED] 26. PHONE: [REDACTED] 27. FAX: [REDACTED] 28. E-MAIL: [REDACTED] 29. WEBSITE: [REDACTED] 30. OTHER: [REDACTED]										31. NAME: [REDACTED] 32. ADDRESS: [REDACTED] 33. CITY: [REDACTED] 34. STATE: [REDACTED] 35. ZIP: [REDACTED] 36. PHONE: [REDACTED] 37. FAX: [REDACTED] 38. E-MAIL: [REDACTED] 39. WEBSITE: [REDACTED] 40. OTHER: [REDACTED]										41. NAME: [REDACTED] 42. ADDRESS: [REDACTED] 43. CITY: [REDACTED] 44. STATE: [REDACTED] 45. ZIP: [REDACTED] 46. PHONE: [REDACTED] 47. FAX: [REDACTED] 48. E-MAIL: [REDACTED] 49. WEBSITE: [REDACTED] 50. OTHER: [REDACTED]										51. NAME: [REDACTED] 52. ADDRESS: [REDACTED] 53. CITY: [REDACTED] 54. STATE: [REDACTED] 55. ZIP: [REDACTED] 56. PHONE: [REDACTED] 57. FAX: [REDACTED] 58. E-MAIL: [REDACTED] 59. WEBSITE: [REDACTED] 60. OTHER: [REDACTED]										61. NAME: [REDACTED] 62. ADDRESS: [REDACTED] 63. CITY: [REDACTED] 64. STATE: [REDACTED] 65. ZIP: [REDACTED] 66. PHONE: [REDACTED] 67. FAX: [REDACTED] 68. E-MAIL: [REDACTED] 69. WEBSITE: [REDACTED] 70. OTHER: [REDACTED]										71. NAME: [REDACTED] 72. ADDRESS: [REDACTED] 73. CITY: [REDACTED] 74. STATE: [REDACTED] 75. ZIP: [REDACTED] 76. PHONE: [REDACTED] 77. FAX: [REDACTED] 78. E-MAIL: [REDACTED] 79. WEBSITE: [REDACTED] 80. OTHER: [REDACTED]										81. NAME: [REDACTED] 82. ADDRESS: [REDACTED] 83. CITY: [REDACTED] 84. STATE: [REDACTED] 85. ZIP: [REDACTED] 86. PHONE: [REDACTED] 87. FAX: [REDACTED] 88. E-MAIL: [REDACTED] 89. WEBSITE: [REDACTED] 90. OTHER: [REDACTED]										91. NAME: [REDACTED] 92. ADDRESS: [REDACTED] 93. CITY: [REDACTED] 94. STATE: [REDACTED] 95. ZIP: [REDACTED] 96. PHONE: [REDACTED] 97. FAX: [REDACTED] 98. E-MAIL: [REDACTED] 99. WEBSITE: [REDACTED] 100. OTHER: [REDACTED]									

**Figure C-4. Tube, Chipboard, Rear**

SOURCE : PHILADELPHIA CONTAINER CO.  
SWANSON ST. AND OREGON AV.  
PHILADELPHIA, PA OR EQUIVALENT

PHILADELPHIA CONTAINER CO. SWANSON ST. AND OREGON AV. PHILADELPHIA, PA OR EQUIVALENT		SOURCE :	
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**Figure C-5. Tube, Chipboard, Forward**



Source: PHILADELPHIA CONTAINER CO  
SWANSON ST AND OREGON AV  
PHILA, PA OR EQUIVALENT

[illegible]

**Figure C-6. Tube**

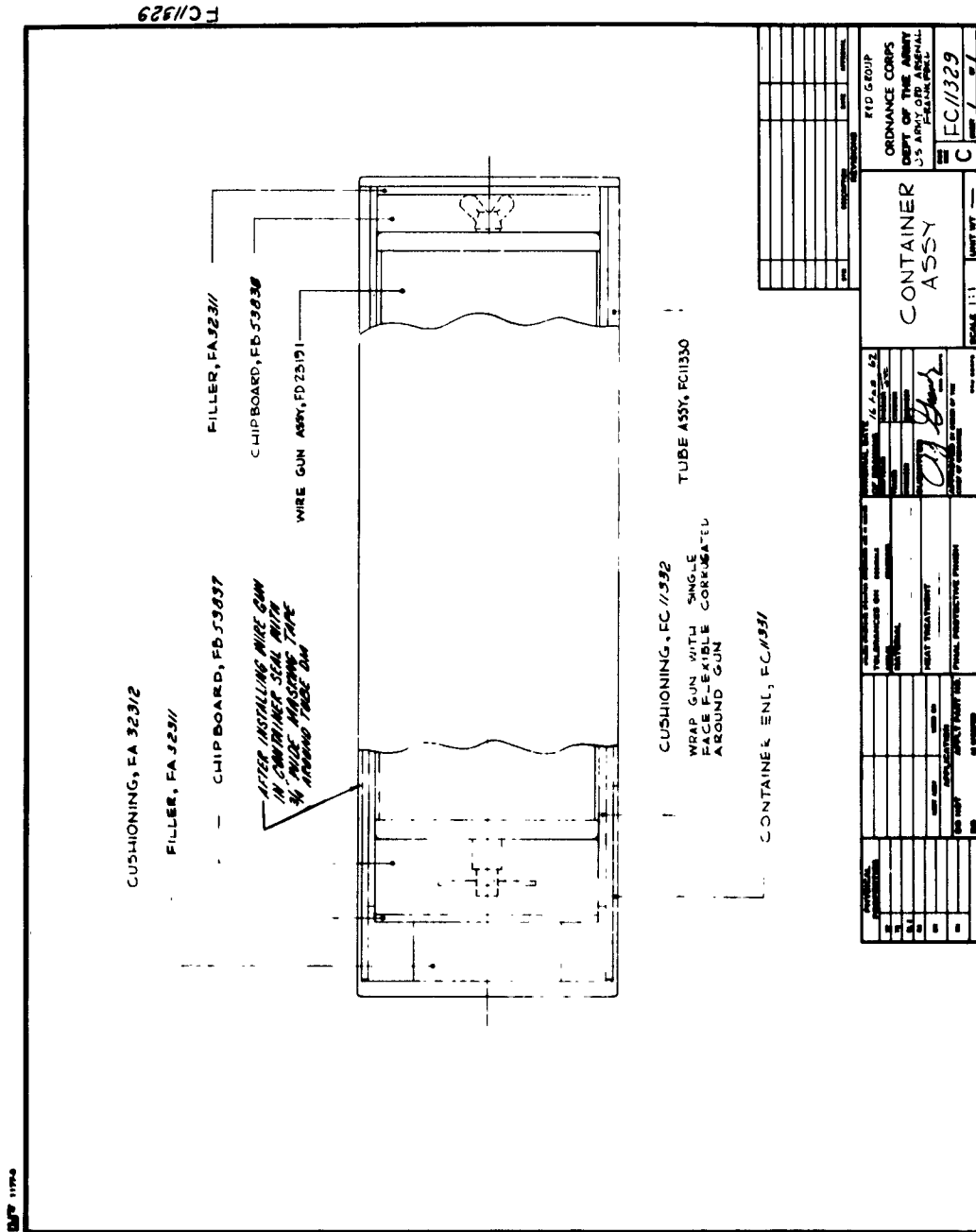


Figure C-7. Container Ass'y

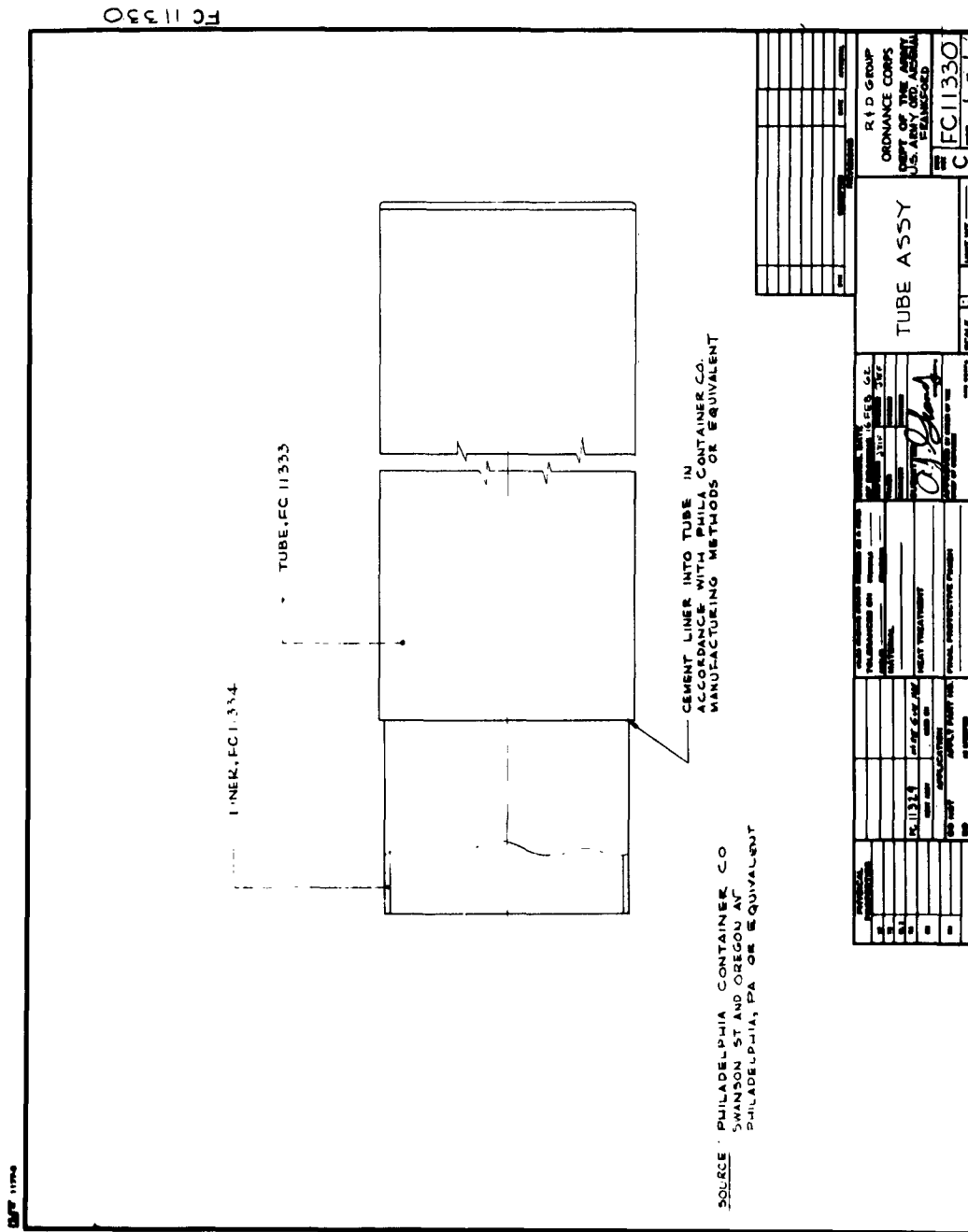
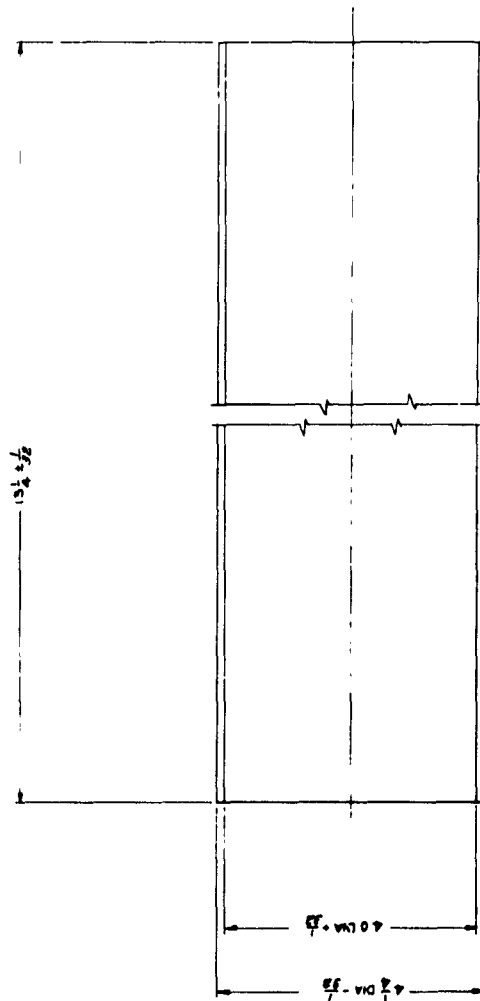


Figure C-8. Tube Ass'y





★C1133★



NOTE: SOURCE: PHILADELPHIA CONTAINER CO.  
SWANSON ST AND OREGON AVE.  
PHILA., PA OR EQUIVALENT

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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**Figure C-11. Tube, Liner**



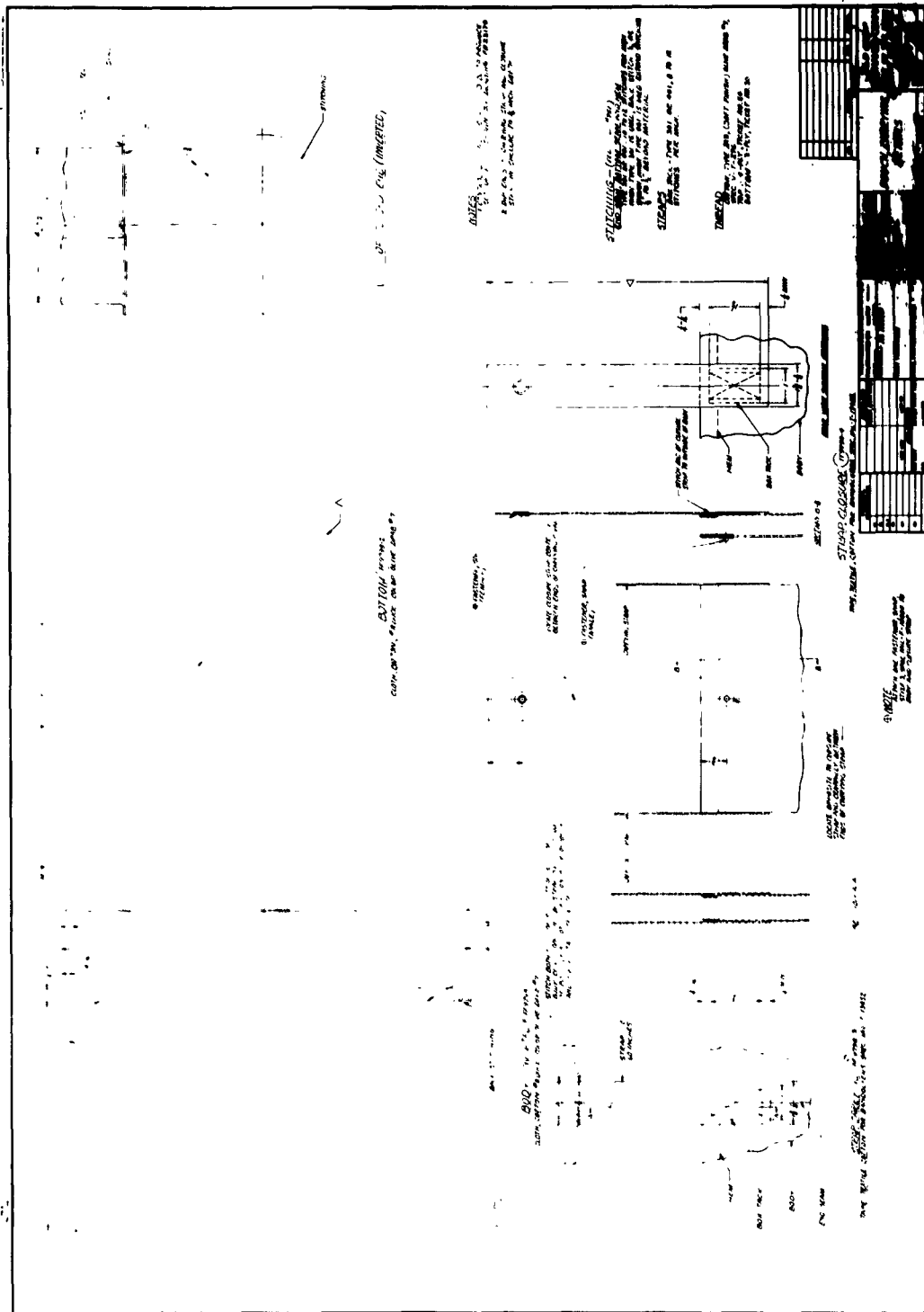


Figure C-13. Pouch, Carrying, Details

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| 1 - Attn: Dr. F. E. Crubbs, BRL  | 1 - Commanding Officer<br>Army Chemical Center<br>Maryland<br>Attn: Mr. W. W. Beyth<br>Weapons Research Div<br>Chemical Warfare Lab |
| 1 - Attn: Mr. H. P. Gay, BRL   |   |
| 1 - Attn: Mr. C. Poor, FWSA,<br>BRL  |   |
| 1 - Attn: Develop & Proof Serv   |   |
| 1 - Attn: Mr. G. T. Watson, D&PS   |   |
| 1 - Attn: Ordnance School  |   |
| 1 - Commanding Officer<br>Springfield Armory<br>Springfield 1, Mass.<br>Attn: Engr Group |   |

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| 1 - President<br>U.S. Army Armor Board<br>Fort Knox, Kentucky   | 1 - The President<br>Anti-Aircraft & Guided<br>Missile Board<br>Fort Bliss, Texas   |
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| 1 - Commandant<br>U.S. Army Artillery &<br>Missile School<br>Fort Sill, Oklahoma<br>Attn: Chf, Combat Develop<br>Dept | 10 - Armed Services Technical<br>Information Agency<br>Arlington Hall Station<br>Arlington 12, Virginia<br>Attn: TIPDR (Code 4) |
| 1 - Commandant<br>U.S. Army Infantry School<br>Fort Benning, Georgia  | 1 - U.S. Naval Ordnance Test<br>Station<br>Inyokern, China Lake<br>California   |
| 1 - President<br>Marine Corps Equip Board<br>Quantico, Virginia<br>Attn: Col Bell                                     | 1 - Commandant<br>Hq, U. S. Marine Corps<br>Washington 25, D. C.  |
| 5 - Commander<br>USA Special Warfare Center<br>Fort Bragg, North Carolina<br>Attn: Command Develop Dept               |   |

<p><b>AD-M62-19-1</b></p> <p>Research and Development Group, Pitman-Dunn Laboratories, Frankford Arsenal, Philadelphia 37, Pa. DESCRIPTION AND OPERATION OF A HAND HELD WIRE GUN by A. J. Grandy and J. W. Hettel.</p> <p>Memorandum Report M62-19-1, February 1962, 71 pp incl illustrations. (OMS Code 5520.12.468 IO, DA Project 596-10-001). UNCLASSIFIED REPORT</p> <p>A hand held version of a wire gun was designed and developed, and a sample lot fabricated for use in controlled tests.</p> <p>During limited development time the device displayed excellent operational characteristics. Further testing will be required to accurately determine adequacy against intended targets.</p> <p>Complete descriptions of design and operation of this device are contained in this report.</p> <p><b>UNCLASSIFIED</b></p> <p>1. Wire Gun</p> <p>I. Grandy, A. J. II. Hettel, J. W. III. OMS Code 5520.12.468 IO IV. DA Project 596-10-001</p> <p><b>DISTRIBUTION LIMITATION:</b> Qualified requesters may obtain copies from ASTIA.</p> <p><b>UNCLASSIFIED</b></p>	<p><b>AD-M62-19-1</b></p> <p>Research and Development Group, Pitman-Dunn Laboratories, Frankford Arsenal, Philadelphia 37, Pa. DESCRIPTION AND OPERATION OF A HAND HELD WIRE GUN by A. J. Grandy and J. W. Hettel.</p> <p>Memorandum Report M62-19-1, February 1962, 71 pp incl illustrations. (OMS Code 5520.12.468 IO, DA Project 596-10-001). UNCLASSIFIED REPORT</p> <p>A hand held version of a wire gun was designed and developed, and a sample lot fabricated for use in controlled tests.</p> <p>During limited development time the device displayed excellent operational characteristics. Further testing will be required to accurately determine adequacy against intended targets.</p> <p>Complete descriptions of design and operation of this device are contained in this report.</p> <p><b>UNCLASSIFIED</b></p> <p>1. Wire Gun</p> <p>I. Grandy, A. J. II. Hettel, J. W. III. OMS Code 5520.12.468 IO IV. DA Project 596-10-001</p> <p><b>DISTRIBUTION LIMITATION:</b> Qualified requesters may obtain copies from ASTIA.</p> <p><b>UNCLASSIFIED</b></p>
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