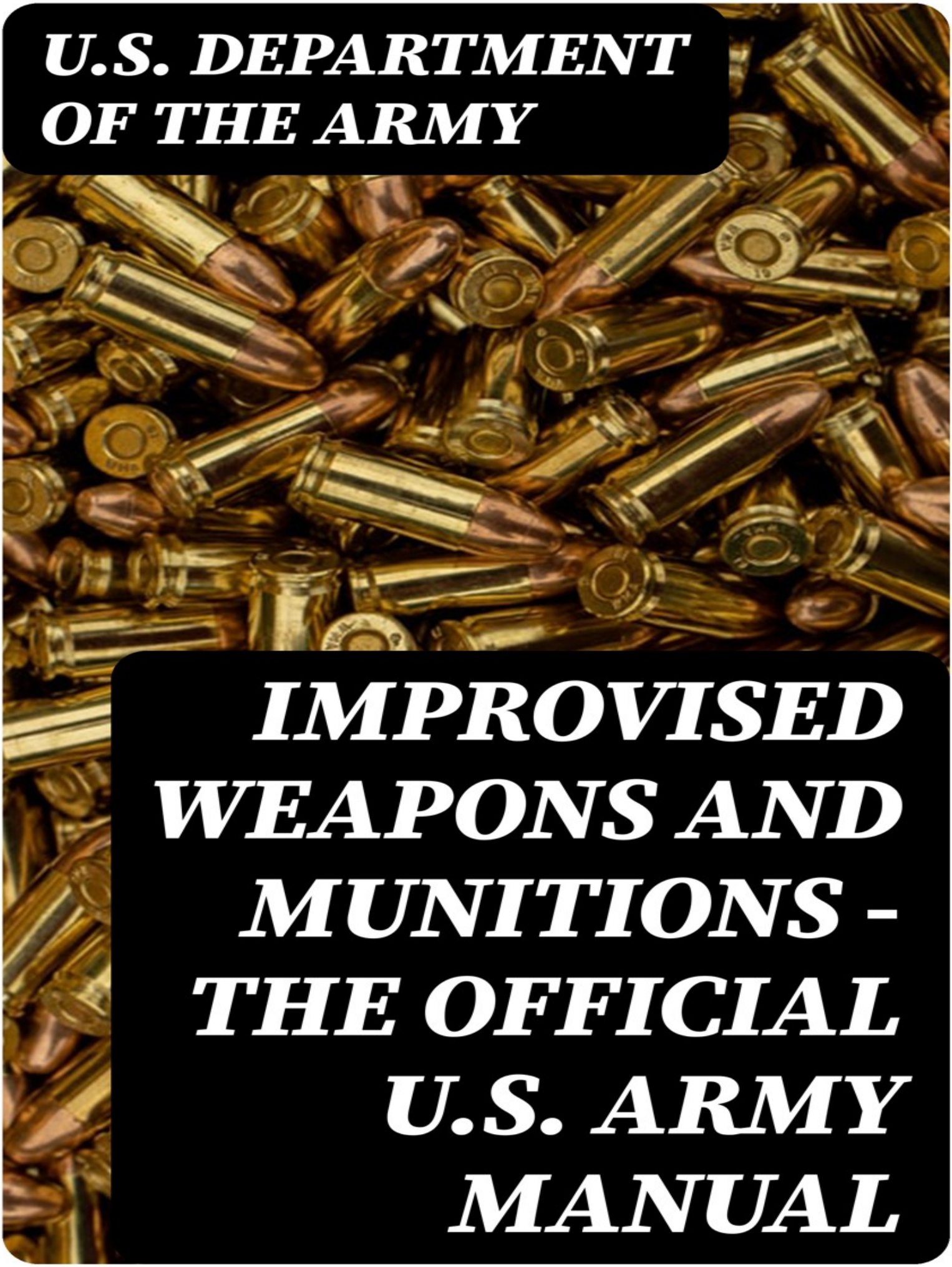
U.S. DEPARTMENT OF THE ARMY



IMPROVISED WEAPONS AND MUNITIONS - THE OFFICIAL U.S. ARMY MANUAL

U.S. Department of the Army

Improvised Weapons and Munitions - The Official U.S. Army Manual

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Introduction

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0.1 Purpose and Scope

In Unconventional Warfare operations it may be impossible or unwise to use conventional military munitions as tools in the conduct of certain missions. It may be necessary instead to fabricate the required munitions from locally available or unassuming materials. The purpose of this manual is to increase the potential of Special Forces and guerrilla troops by describing in detail the manufacture of munitions from seemingly innocuous locally available materials.

Manufactured, precision devices almost always will be more effective, more reliable, and easier to use than improvised ones, but shelf items will just not be available for certain operations for security or logistical reasons. Therefore the operator will have to rely on materials he can buy in a drug or paint store, find in a junk pile, or scrounge from military stocks. Also, many of the ingredients and materials used in fabricating homemade items are so commonplace or innocuous they can be carried without arousing suspicion. The completed item itself often is more easily concealed or camouflaged. In addition, the field expedient item can be tailored for the intended target, thereby providing an advantage over the standard item in flexibility and versatility.

The manual contains simple explanations and illustrations to permit construction of the items by personnel not normally familiar with making and handling munitions. These items were conceived in-house or, obtained from

other publications or personnel engaged in munitions or special warfare work. This manual includes methods for fabricating explosives, detonators, propellants, shaped charges, small arms, mortars, incendiaries, delays, switches, and similar items from indigenous materials.

0.2 Safety and Reliability

Each item was evaluated both theoretically and experimentally to assure safety and reliability. A large number of items were discarded because of inherent hazards or unreliable performance. Safety warnings are prominently inserted in the procedures where they apply but it is emphasized that safety is a matter of attitude. It is a proven fact that men who are alert, who think out a situation, and who take correct precautions have fewer accidents than the careless and indifferent. It is important that work be planned and that instructions be followed to the letter; all work should be done in a neat and orderly manner. In the manufacture of explosives, detonators, propellants and incendiaries, equipment must be kept clean and such energy concentrations as sparks, friction, impact, hot objects, flame, chemical reactions, and excessive pressure should be avoided.

These items were found to be effective in most environments; however, samples should be made and tested remotely prior to actual use to assure proper performance. Chemical items should be used as soon as possible after preparation and kept free of moisture, dirt, and the above energy concentrations. Special care should be taken in any attempt at substitution or use of items for purposes other than that specified or intended.

0.3 User Comments

It is anticipated that this manual will be revised or changed from time to time. In this way it will be possible to update present material and add new items as they become available. Users are encouraged to submit recommended changes or comments to improve this manual. Comments should be keyed to the specific page, paragraph, and line of the text in which changes are recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded directly to Commandant, United States Army, Special Warfare School, Fort Bragg, North Carolina 28307 and Commanding Officer, United States Army, Frankford Arsenal, SMUFA-J8000, Philadelphia, Pennsylvania 19137.

Chapter 1
Explosives and Propellants

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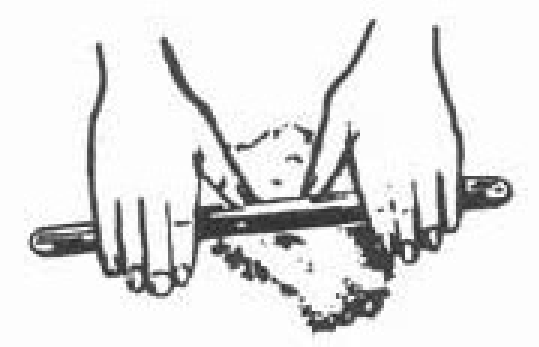
1.1 Plastic Explosive Filler

A plastic explosive filler can be made from potassium chlorate and petroleum jelly. This explosive can be detonated with commercial #8 or any military blasting cap.

Materials Required	**How Used**
Potassium chlorate	Medicine Manufacture of matches
Petroleum jelly (Vaseline)	Medicine Lubricant
Piece of round stick	
Wide bowl or other container for mixing ingredients	

Procedure

1. Spread potassium chlorate crystals thinly on a hard surface. Roll the round stick over crystals to crush into a very fine powder until it looks like face powder or wheat flour.



2. Place 9 parts powdered potassium chlorate and 1 part petroleum jelly in a wide bowl or similar container. Mix ingredients with hands (knead) until a uniform paste is obtained.

Note: Store explosive in a waterproof container until ready to use.

1.2 Potassium Nitrate

Potassium nitrate (saltpeter) can be extracted from many natural sources and can be used to make nitric acid, black powder and many pyrotechnics. The yield ranges from 0.1 to 10% by weight, depending on the fertility of the soil.

Materials	**Source**
Nitrate bearing earth or other	Soil containing old

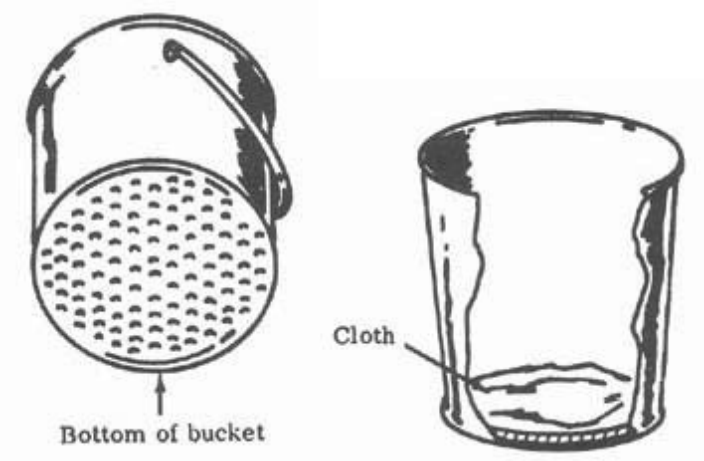
material, about 3-1/2 gallons (13-1/2 liters)	decayed vegetable or animal matter Old cellars and/or farm dirt floors Earth from old burial grounds Decayed stone or mortar building foundations
Fine wood ashes, about 1/2 cup (1/8 liter)	Totally burned whitish wood ash powder Totally burned paper (black)
Bucket or similar container, about 5 gallons (19liters) in volume (plastic, metal, or wood)	
2 pieces of finely woven cloth, each slightly larger than bottom of bucket	
Shallow pan or dish, at least as large as bottom of bucket	
Shallow heat resistant container (ceramic, metal, etc.)	
Water – 1-3/4 gallons (6-3/4 liters)	
Awl, knife, screwdriver, or other hole producinginstrument	

Alcohol about 1 gallon (4 liters) (whiskey, rubbing alcohol, etc.)	
Heat source (fire, electric heater, etc.)	
Paper	
Tape	

Note: Only the ratios of the amounts of ingredients are important. Thus, for twice as much potassium nitrate, double quantities used.

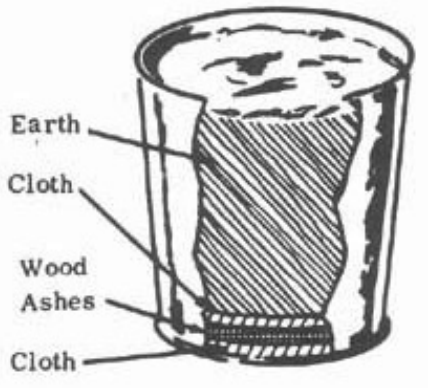
Procedure

1. Punch holes in bottom of bucket. Spread one piece of cloth over holes inside of bucket.

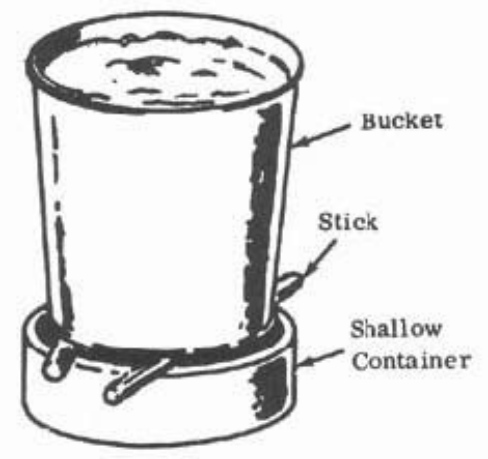


2. Place wood ashes on cloth and spread to make a layer about the thickness of the cloth. Place second piece of cloth on top of ashes.

3. Place dirt in bucket.



4. Place bucket over shallow container. Bucket may be a ported on sticks if necessary.

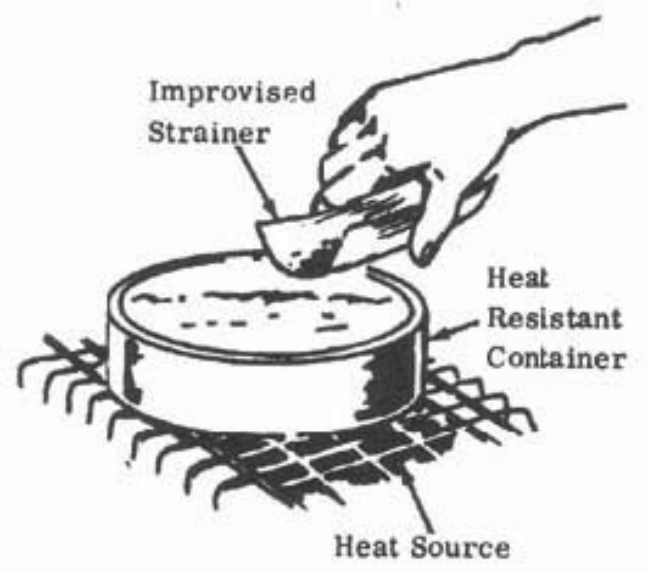


5. Boil water and pour it over earth in bucket a little at a time. Allow water to run through holes in bucket into shallow container. Be sure water goes through all of the earth. Allow drained liquid to cool and settle for 1

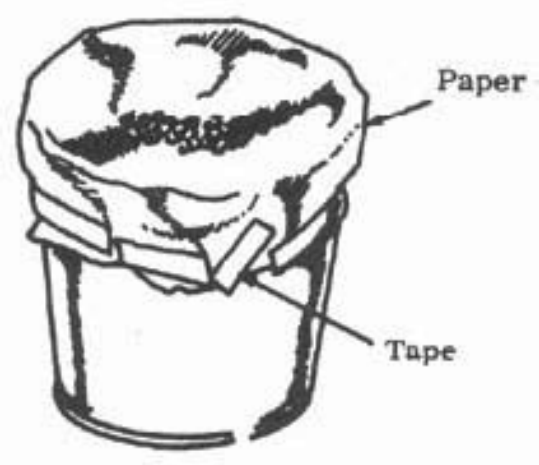
to 2 hours.

Note: Do not pour all of the water at once, since this may cause stoppage.

6. Carefully drain off liquid into heat resistant container. Discard any sludge remaining in bottom of the shallow container.
7. Boil mixture over hot fire for at least 2 hours. Small grains of salt will begin to appear in the solution. Scoop these out as they form, using any type of improvised strainer (paper, etc.).



8. When liquid has boiled down to approximately half its original volume, remove from fire and let sit. After half an hour add an equal volume of alcohol. When mixture is poured through paper, small white crystals will collect on top of it.



9. To purify the potassium nitrate, redissolve the dry crystals in the smallest possible amount of boiled water. Remove any salt crystals that appear (step 7); pour through an improvised filter made of several pieces of paper and evaporate or gently heat the concentrated solution to dryness.
10. Spread crystals on flat surface and allow to dry. The potassium nitrate crystals are now ready for use.

1.3 Improvised Black Powder

Black powder can be prepared in a simple, safe manner. It may be used as blasting or gun powder.

Materials Required
Potassium nitrate, granulated, 3 cups (3/4 liter) (section 1.2)
Wood charcoal, powdered, 2 cups (1/2 liter)
Sulfur, powdered, 1/2 cup (1/8 liter)
Alcohol, 5 pints (2-1/2 liters) (whiskey, rubbing alcohol, etc.)

Water, 3 cups (3/4 liter)
Heat source
2 Buckets – each 2 gallon (7-1/2 liters) capacity, at least one of which is heat resistant (metal, ceramic, etc.)
Flat window screening, at least 1 foot (30 cm) square
Large wooden stick
Cloth, at least 2 feet (60 cm) square

Note: The above amounts will yield two pounds (900 grams) of black powder. However, only the ratios of the amounts of ingredients are important. Thus, for twice as much black powder, double all quantities used.

Procedure

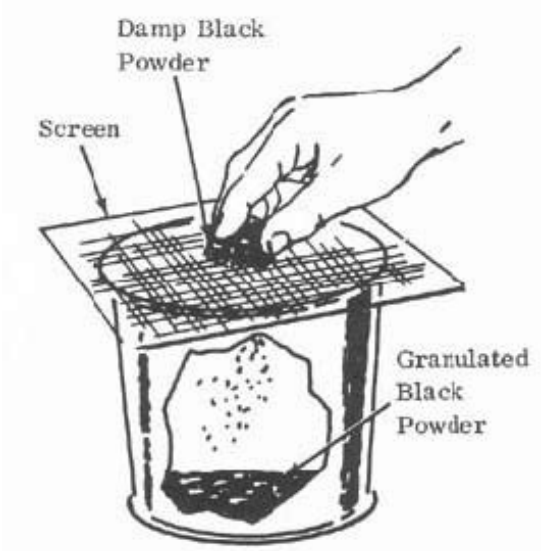
1. Place alcohol in one of the buckets.
2. Place potassium nitrate, charcoal, and sulfur in the heat resistant bucket. Add 1 cup water and mix thoroughly with wooden stick until all ingredients are dissolved.
3. Add remaining water (2 cups) to mixture. Place bucket on heat source and stir until small bubbles begin to form.

> **Caution:** Do not boil mixture. Be sure *all* mixture stays wet. If any is dry, as on sides of pan, it may ignite.

4. Remove bucket from heat and pour mixture into alcohol while stirring vigorously.

5. Let alcohol mixture stand about 5 minutes. Strain mixture through cloth to obtain black powder. Discard liquid. Wrap cloth around black powder and squeeze to remove all excess liquid.

6. Place screening over dry bucket. Place workable amount of damp powder on screen and granulate by rubbing solid through screen.



Note: If granulated particles appear to stick together and change shape, recombine entire batch of powder and repeat steps 5 and 6.

7. Spread granulated black powder on flat dry surface so that layer about 1/2 inch (1-1/4 cm) is formed. Allow to dry. Use radiator, or direct sunlight. This should be dried as soon as possible, preferably in one hour. The longer the drying period, the less effective the black powder.

Caution: Remove from heat *as soon as* granules are dry. Black powder is now ready for use.

1.4 Nitric Acid

Nitric acid is used in the preparation of many explosives, incendiary mixtures, and acid delay timers. It may be prepared by distilling a mixture of potassium nitrate and concentrated sulfuric acid.

Materials Required	Source
Potassium nitrate (2 parts by volume)	Drug Store Improvised (section 1.2)
Concentrated sulfuric acid (1 part by volume)	Motor vehicle batteries Industrial plants
2 bottles or ceramic jugs (narrow necks are preferable)	
Pot or frying pan	
Heat source (wood, coal, or charcoal)	
Tape (paper, electrical, masking, etc. but *not* cellophane)	
Paper or rags	

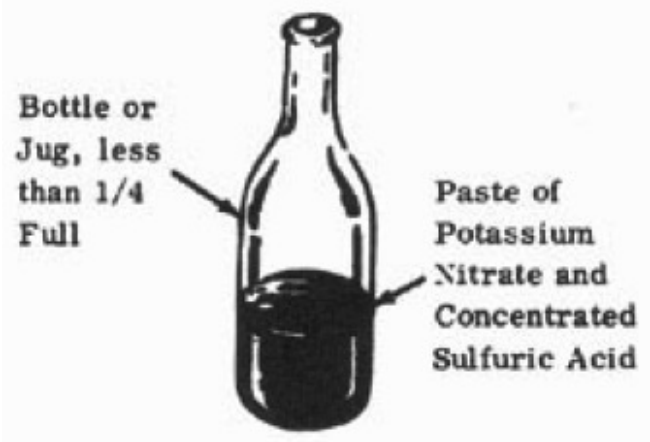
Important: If sulfuric acid is obtained from a motor vehicle battery, concentrate it by boiling it until white fumes appear. Do not inhale fumes.

Note: The amount of nitric acid produced is the same as the amount of potassium nitrate. Thus, for 2 tablespoonfuls of nitric acid, use 2 tablespoonfuls of potassium nitrate and 1 tablespoonful of concentrated sulfuric acid.

Procedure

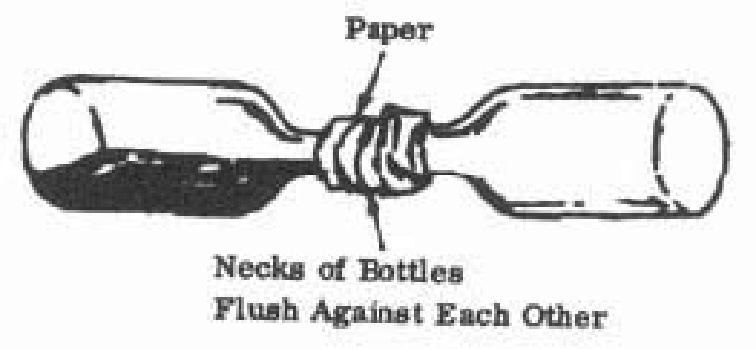
1. Place dry potassium nitrate in bottle or jug. Add sulfuric acid. Do not fill bottle more than 1/4 full. Mix

until paste is formed.

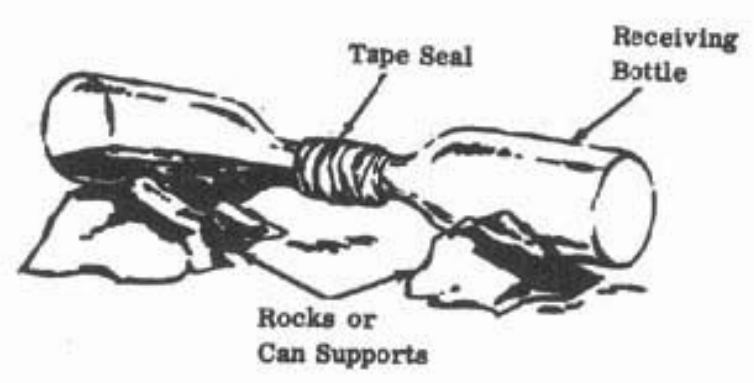


Caution: Sulfuric acid will burn skin and destroy clothing. If any is spilled, wash it away with a large quantity of water. Fumes are also dangerous and should not be inhaled.

2. Wrap paper or rags around necks of 2 bottles. Securely tape necks of bottles together. Be sure bottles are flush against each other and that there are no air spaces.

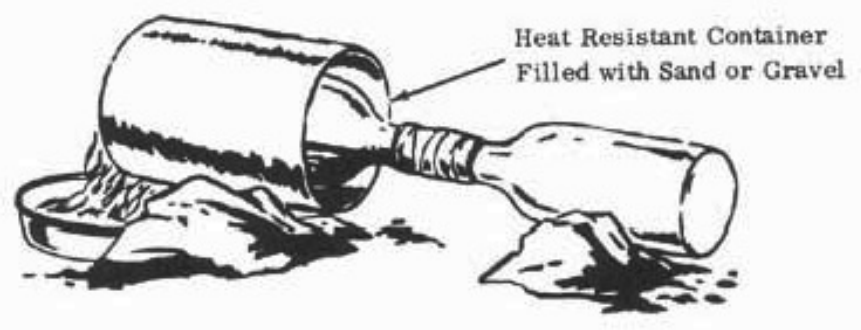


3. Support bottles on rocks or cans so that empty bottle is slightly lower than bottle containing paste so that nitric acid that is formed in receiving bottle will not run into other bottle.



4. Build fire in pot or frying pan.
5. Gently heat bottle containing mixture by moving fire in and out. As red fumes begin to appear periodically pour cool water over empty receiving bottle. Nitric acid will begin to form in the receiving bottle.

Caution: Do not overheat or wet bottle containing mixture or it may shatter. As an added precaution, place bottle to be heated in heat resistant container filled with sand or gravel. Heat this outer container to produce nitric acid.



6. Continue the above process until no more red fumes are formed. If the nitric acid formed in the receiving bottle is not clear (cloudy) pour it into cleaned bottle and repeat steps 2–6.

Caution: Nitric acid will burn skin and destroy clothing. If any is spilled, wash it away with a large quantity of water. Fumes are also dangerous and should not be inhaled. Nitric acid should be kept away from all combustibles and should be kept in a *sealed ceramic or glass* container.

1.5 Initiator for Dust Explosions

An initiator which will initiate common material to produce dust explosions can be rapidly and easily constructed. This type of charge is ideal for the destruction of enclosed areas such as rooms or buildings.

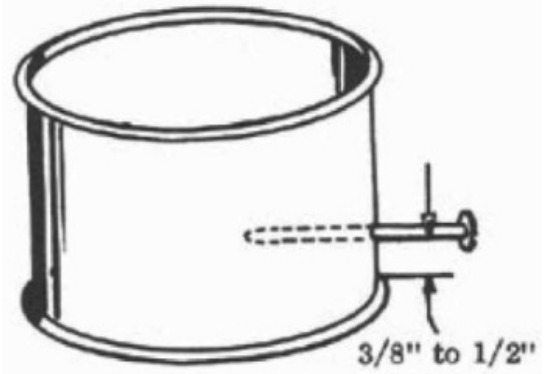
Materials Required
A flat can, 3 inches (8 cm) diameter and 1-1/2 inch (3-3/4 cm) high. A 6-1/2 ounce (185 g) tuna can serves the purpose quite well.

Blasting cap
Explosive
Aluminum (may be wire, cut sheet, flattened can or powder
Large nail, 4 inches (10 cm) long
Wooden rod – 1/4 inch (6 mm) diameter
Flour, gasoline and powder or chipped aluminum

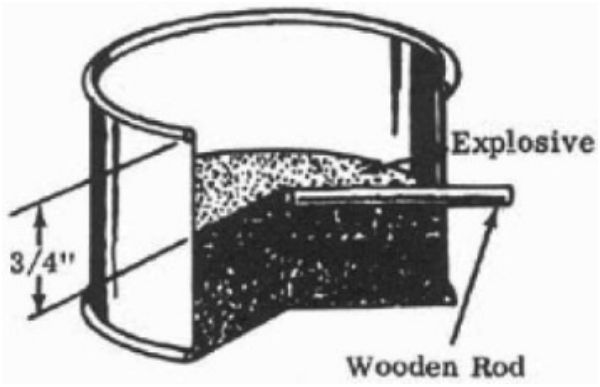
Note: Plastic explosives (Composition C4, etc.) produce better explosions than cast explosives (Composition B, etc.).

Procedure

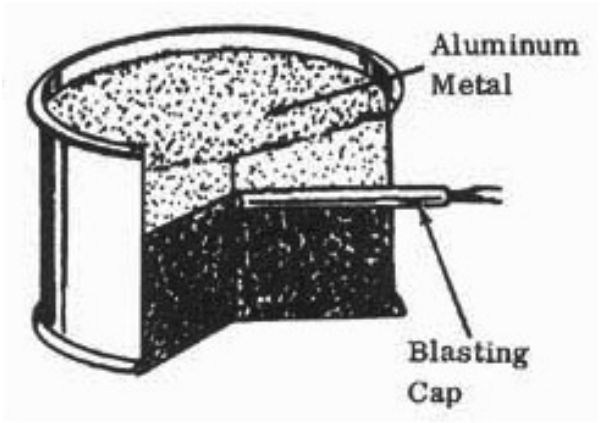
1. Using the nail, press a hole through the side of the tuna can 3/8 to 1/2 inch (1 to 1-1/2 cm) from the bottom. Using a rotating and lever action, enlarge the hole until it will accommodate the blasting cap.



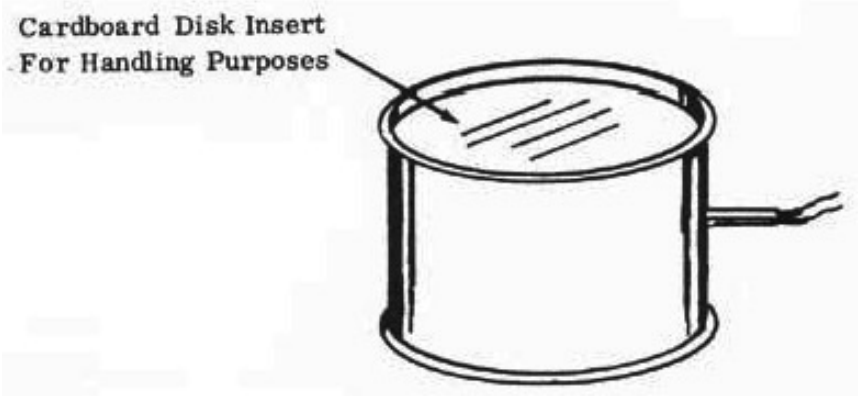
2. Place the wooden rod in the hole and position the end of the rod at the center of the can.
3. Press explosive into the can, being sure to surround the rod, until it is 3/4 inch (2 cm) from top of the can. Carefully remove the wooden rod.



4. Place the aluminum metal on top of the explosive.
5. Just before use, insert the blasting cap into the cavity made by the rod. The initiator is now ready for use.



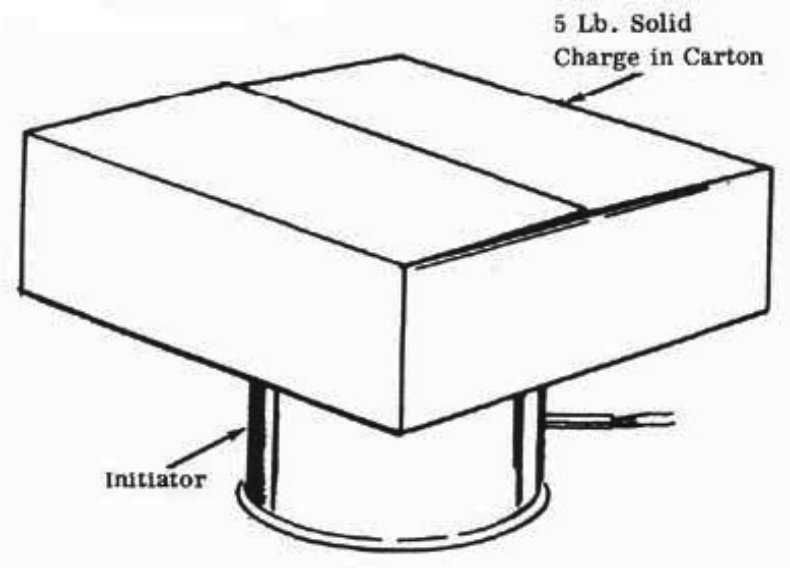
Note: If it is desired to carry the initiator some distance, cardboard may be pressed on top of the aluminum to insure against loss of material.



How to Use

This particular unit works quite well to initiate charges of five pounds of flour, 1/2 gallon (1-2/3 liters) of gasoline or two pounds of flake painters aluminum. The solid materials may merely be contained in sacks or cardboard cartons. The gasoline may be placed in plastic coated paper milk cartons, plastic or glass bottles. The charges are placed directly on top of the initiator and the blasting cap is actuated electrically or by fuse depending on the type of cap employed. This will destroy a 2,000 cubic feet enclosure (building 10 x 20 x 10 feet).

Note: For larger enclosures, use proportionately larger initiators and charges.



1.6 Fertilizer Explosive

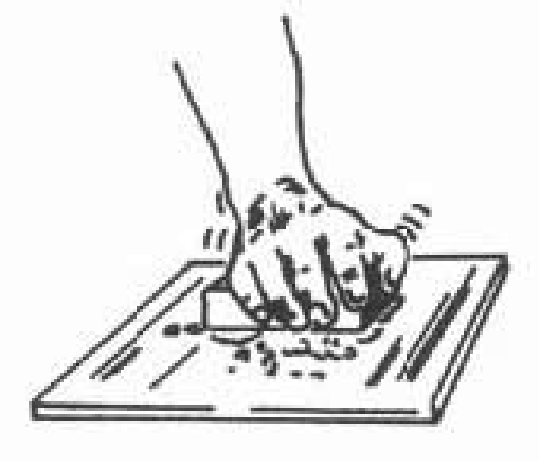
An explosive munition can be made from fertilizer grade ammonium nitrate and either fuel oil or a mixture of equal parts of motor oil and gasoline. When properly prepared,

this explosive munition can be detonated with a blasting cap.

Materials Required
Ammonium nitrate (not less than 32% nitrogen)
Fuel oil or gasoline and motor oil 1:1 ratio)
Two flat boards. (At least one of these should be comfortably held in the hand, i.e. 2 x 4 and 36 x 36.)
Bucket or other container for mixing ingredients
Iron or steel pipe or bottle, tin can or heavy-walled cardboard tube
Blasting cap
Wooden rod – 1/4 inch diameter
Spoon or similar measuring container

Procedure

1. Spread a handful of the ammonium nitrate on the large flat board and rub vigorously with the other board until the large particles are crushed into a very fine powder that looks like flour (approximately 10 minutes).



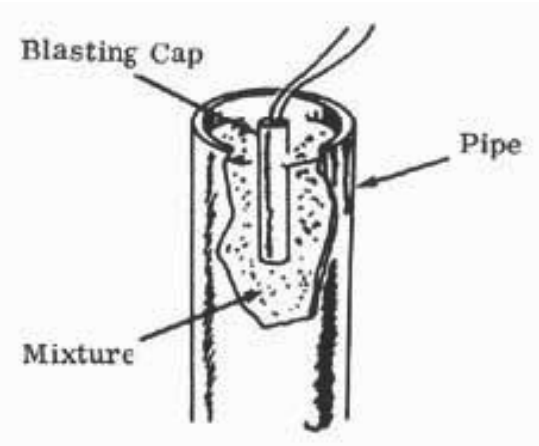
Note: Proceed with step 2 as soon as possible since the powder may take moisture from the air and become spoiled.

2. Mix one measure (cup, tablespoon, etc.) of fuel oil with 16 measures of the finely ground ammonium nitrate in a dry bucket or other suitable container and stir with the wooden rod. If fuel oil is not available, use one half measure of gasoline and one half measure of motor oil. Store in a waterproof container until ready to use.

3. Spoon this mixture into an iron or steel pipe which has an end cap threaded on one end. If a pipe is not available, you may use a dry tin can, a glass jar or a heavy-walled cardboard tube.

Note: Take care not to tamp or shake the mixture in the pipe. If mixture becomes tightly packed, one cap will not be sufficient to initiate the explosive.

4. Insert blasting cap just beneath the surface of the explosive mix.



Note: Confining the open end of the container will add to the effectiveness of the explosive.

1.7 Carbon Tet – Explosive

A moist explosive mixture can be made from fine aluminum powder combined with carbon tetrachloride or tetrachloroethylene. This explosive can be detonated with a blasting cap.

Materials Required	**Source**
Fine aluminum bronzing powder	Paint Store
Carbon tetrachloride, or tetrachloroethylene	Pharmacy, or fire extinguisher fluid Dry cleaners, Pharmacy
Stirring rod (wood)	
Mixing container (bowl,	

bucket, etc.)	
Measuring container (cup, tablespoon, etc.)	
Storage container (jar, can, etc.)	
Blasting cap	
Pipe, can or jar	

Procedure

1. Measure out two parts aluminum powder to one part carbon tetrachloride or tetrachloroethylene liquid into mixing container, adding liquid to powder while stirring with the wooden rod.
2. Stir until the mixture becomes the consistency of honey syrup.

Caution: Fumes from the liquid are dangerous and should not be inhaled.

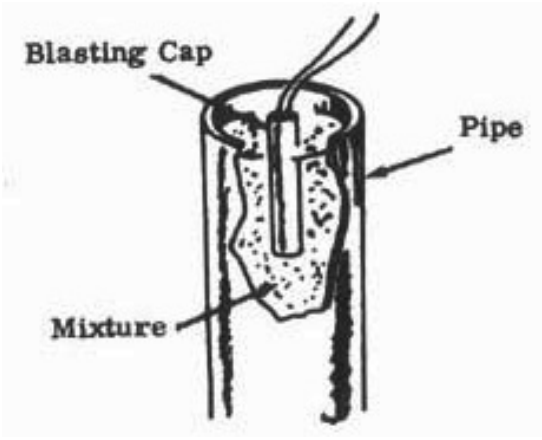
3. Store explosive in a jar or similar water proof container until ready to use. The liquid in the mixture evaporates quickly when not confined.

Note: Mixture will detonate in this manner for a period of 72 hours.

How to Use

1. Pour this mixture into an iron or steel pipe which has an end cap threaded on one end. If a pipe is not available, you may use a dry tin can or a glass jar.

2. Insert blasting cap just beneath the surface of the explosive mix.



Note: Confining the open end of the container will add to the effectiveness of the explosive.

1.8 Fertilizer AN-Al Explosive

A dry explosive mixture can be made from ammonium nitrate fertilizer combined with fine aluminum powder. This explosive can be detonated with a blasting cap.

Materials Required	**Source**
Ammonium nitrate fertilizer (not less than 32% nitrogen)	Farm or Feed Store
Fine aluminum bronzing powder	Paint Store
Measuring container (cup, tablespoon, etc.)	
Mixing container (wide bowl, can, etc.)	