

**PROFESSIONAL
HOMEMADE
SALUTES**

By JOSEPH ABRUSCI

**DESERT
PUBLICATIONS**

PROFESSIONAL HOMEMADE SALUTES

by
Joseph Abrusci

ISBN 0-87947-542-0

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Desert Publications

DESERT PUBLICATIONS
Cornville, Arizona 86325

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- WARNING -

THE MAKING AND USING OF FIREWORKS, AS WITH ANY EXPLOSIVE, IS POTENTIALLY HAZARDOUS AND THE READER IS ADVISED TO EXERCISE EXTREME CAUTION WHEN MAKING AND USING ANY OF THE DEVICES DESCRIBED IN THIS BOOK. THE READER IS, ALSO, ADVISED TO REMAIN COGNIZANT OF ALL APPLICABLE LAWS PERTAINING TO FIREWORKS AND EXPLOSIVES.

GENERAL INFORMATION

Exploding fireworks are very easy to make and, if reasonable care is exercised during the making and using, they are relatively safe.

Our efforts will be concentrated on six types of exploding fireworks:

Miniature Salutes

Kraft Salutes

Super Kraft Salutes

Stick Salutes

Thunderbolt Salutes

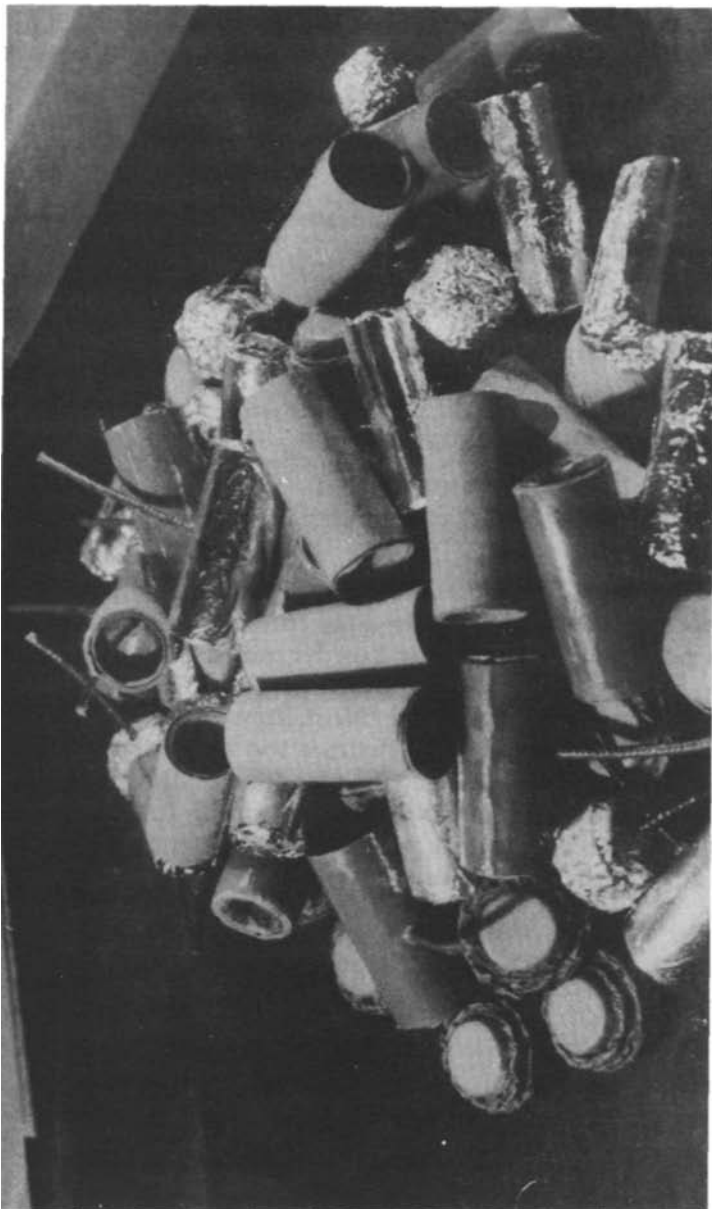
Super Thunderbolt Salutes

The above fireworks are comprised of the following components: Cases made from scrap cardboard or paper; End plugs made from grocery bags; Powder mixed from purchased ingredients; and Fuse which is purchased*.

Fuses are very important! Most fireworks accidents are caused by faulty fuses; fuses that are too short or fuses that have been carelessly inserted or attached to the fireworks.

Only controlled 3/32 in. dia. waterproof fuse is recommended. The length of the fuse should be from 2 to 4 inches with 2 inches an absolute minimum!

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THE ABOVE PHOTOGRAPH SHOWS SOME OF THE FINISHED SALUTES THAT CAN BE EASILY MADE BY FOLLOWING THE DIRECTIONS IN THIS BOOK.

POWDER FORMULA

The following formula is very hazardous and extreme care should be used when mixing, storing or using it. Be sure to use the powder mixing instructions as given in this book. When filling cases never fill over 1/3 full. Also, never ram or compress the powder in the case.

Quantities given in the following formulas are in units of weight. Do not mix by volume! Any type weight measurement can be used (grams, ounces, etc.) just as long as the same type is used for all the ingredients.

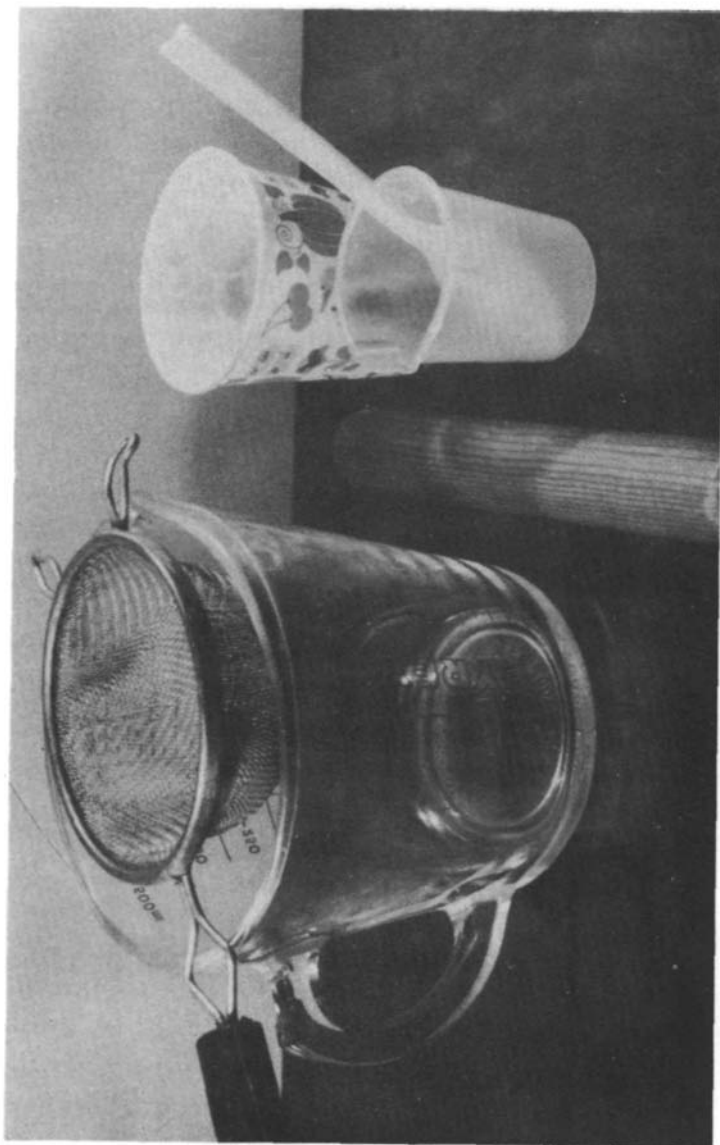
Ingredient	Parts By Weight
Potassium Chlorate	2
Pyro Aluminum (400 mesh).	1
Sulfur.	1

If Potassium Chlorate is unavailable or if you desire a less volatile mixture the following formula can be used.

Ingredients	Parts By Weight
Potassium Nitrate.	5
Pyro Aluminum (400 mesh).	2
Sulfur.	3



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THE PHOTOGRAPH ABOVE SHOWS SOME OF THE UTENSILS THAT YOU WILL BE USING TO CORRECTLY MIX YOUR POWDER.

MIXING OF POWDER

Powder mixing is a step by step operation with the most dangerous step (the adding of the oxidizing agent potassium chlorate) reserved for last for obvious safety reasons. Powder should be mixed in small quantities using only paper or cardboard to contain and mix. Any procedure that might produce a spark or friction is to be avoided.

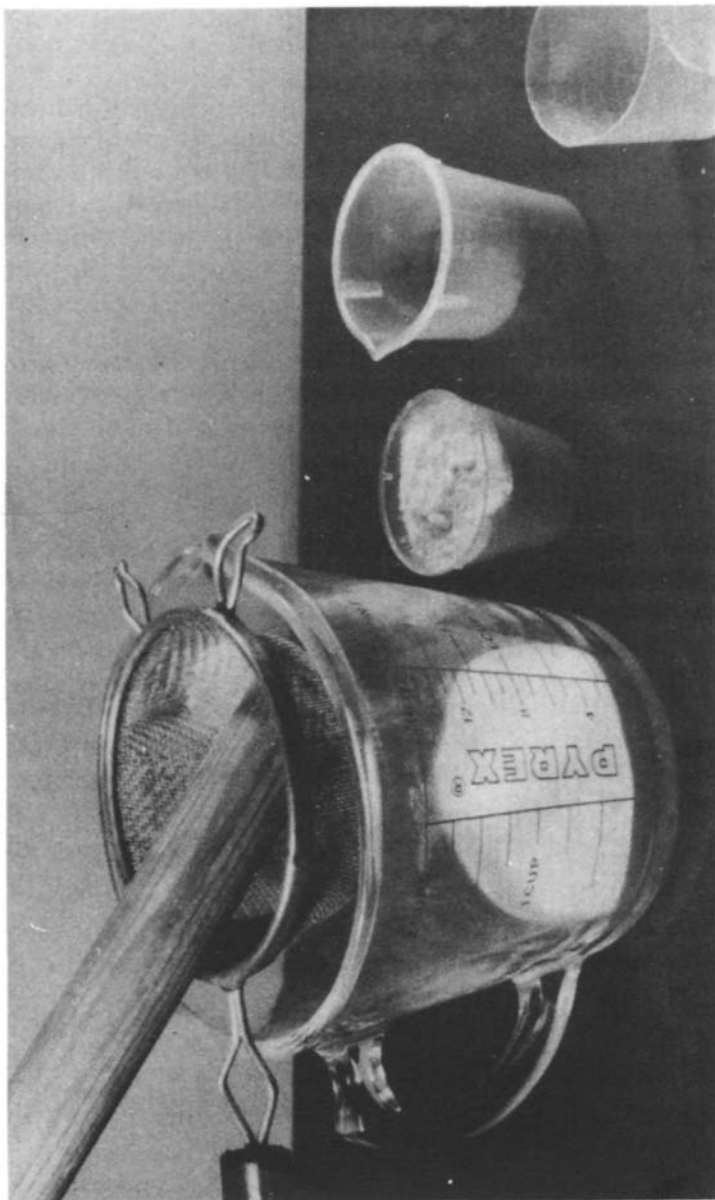
All ingredients are measured by weight.

Begin mixing by weighing the proper amount of sulfur and screening it through a fine mesh kitchen strainer onto a sheet of newspaper. Now add the correct amount of pyro aluminum to the sulfur and mix thoroughly until a fine blend is obtained.

Now, CAREFULLY, add the correct amount of potassium chlorate only after screening it through the fine mesh kitchen strainer to insure its being fine grain enough to mix well with the sulfur and pyro aluminum.

Mixing the three ingredients is SAFELY accomplished by picking up the sheet of newspaper containing them and rolling the mixture by first elevating one side of the paper then the other. Continue this for about ten minutes until you have a fine, well mixed mixture. Remember, at all times during the mixing process there should be no friction or spark producing materials used!

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BEFORE MIXING ANY OF THE POWDER COMPONENTS TOGETHER EACH SHOULD BE SIEVED TO BREAK UP ANY LUMPS THAT MIGHT EXIST.

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THE SULFUR AND PYRO ALUMINUM HAVE BEEN THOROUGHLY MIXED AND NOW WE ARE READY TO ADD THE POTASSIUM CHLORATE.

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CAREFULLY POUR THE POTASSIUM CHLORATE ONTO THE SULFUR/ALUMINUM MIXTURE.

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CONTINUE MIXING BY FIRST RAISING ONE SIDE OF THE PAPER THEN THE OTHER.

MAKING CASES FROM SCRAP CARDBOARD

The cardboard used for fireworks casings is the type of cardboard found in cereal boxes, pizza boxes, cracker boxes and other similar type containers. If you examine this cardboard carefully you will notice that it has a "grain." Like wood it will bend or form easier by rolling with the grain.

In making the various fireworks described in this book you will be cutting various width strips of cardboard to form the casings. The width of these strips will correspond to the length of the casing desired. The length of these strips will vary according to the thickness of cardboard used and will have to be determined by trial and error. Each type of salute described will refer to a casing size by the I.D., O.D., and length. The I.D. (inside diameter) is determined by the former or dowel used. The O.D. (outside diameter) is determined by how much cardboard is rolled up to form the casing.

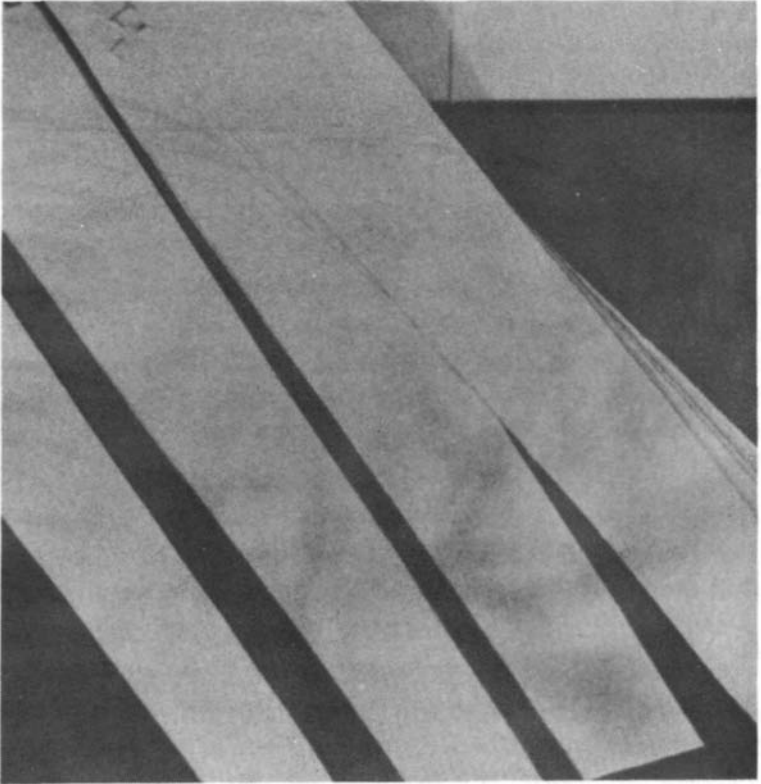
With the former or dowel desired, roll up a strip of the cardboard you have selected to use until the O.D. of the casing equals that called out in the instructions. Unroll this strip and measure the length. If you continue to use the same thickness cardboard then you can pre-cut your strips to the same length.

Begin forming a casing by tightly rolling the first roll with adhesive applied to edge. Continue to tightly roll and secure the last edge with adhesive. Remove casing from former and set aside to thoroughly dry. If your cardboard has a slick surface with printing on it then you might wish to peel off approximately 2 inches from each end for better adhering of the adhesive.

NOTE; The stronger the casings the louder the "report" of salutes. Therefore, your casings should be well made with the fuse and end plugs well secured.

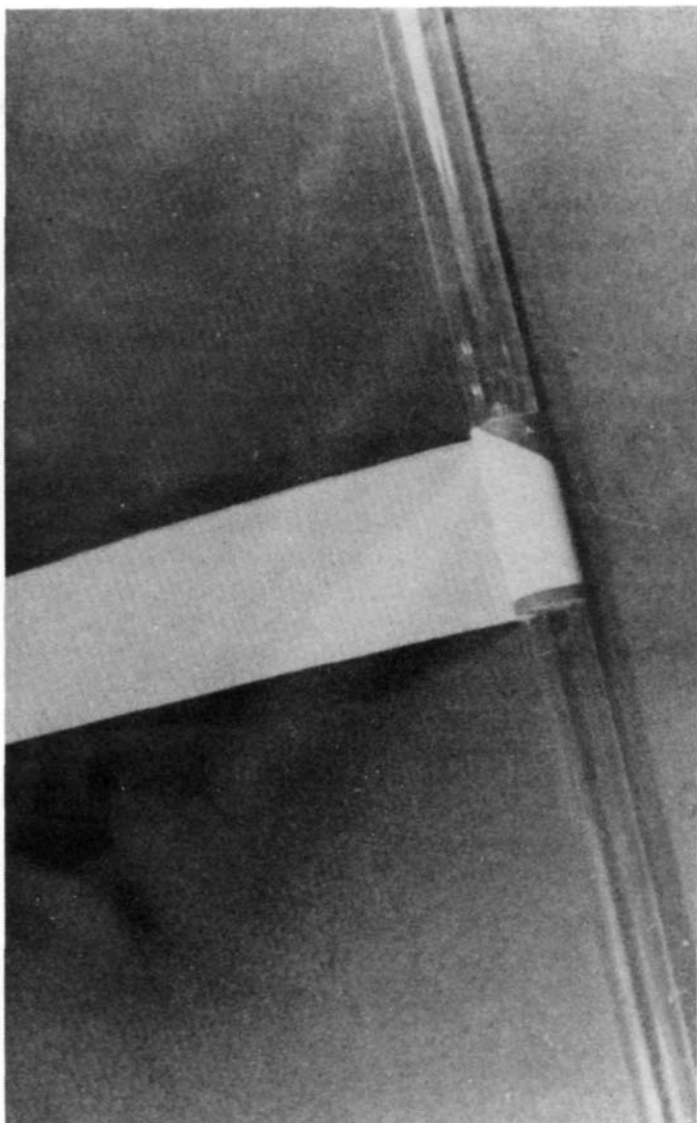
CAUTION: Use only cardboard and paper for making casings and end plugs. DO NOT use metal, wood, glass, or any substance that might become a "missile" and inflict injury.

PROFESSIONAL HOMEMADE SALUTES



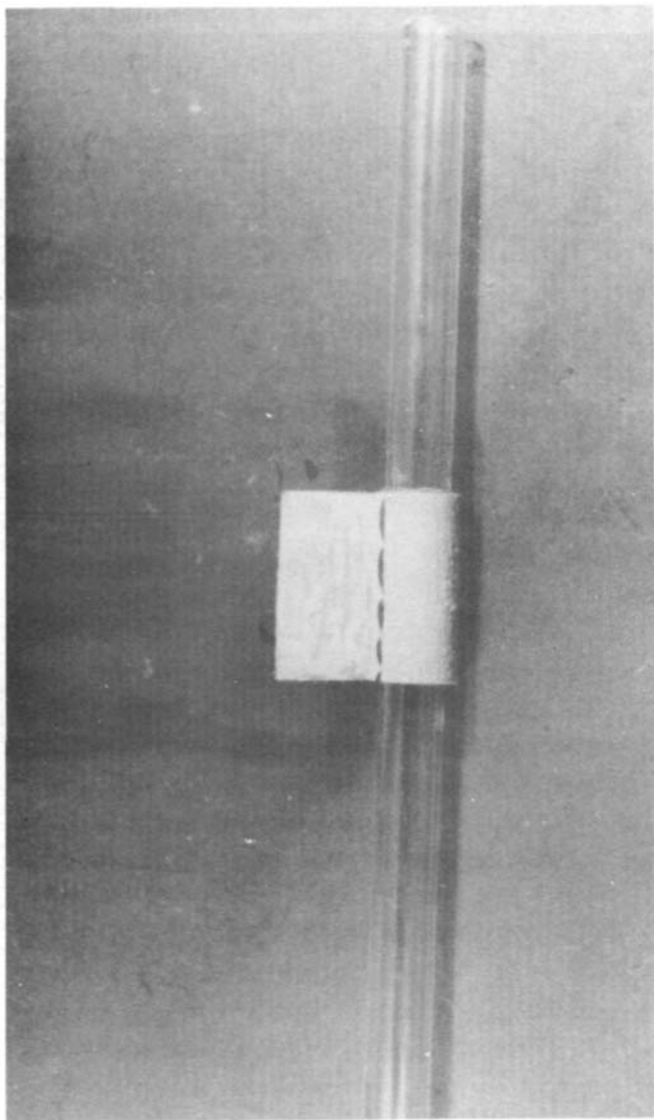
CARDBOARD STRIPS READY TO BE ROLLED INTO CASES. A LARGE PAPER CUTTER MAKES EASY WORK OF THIS. IF YOU DON'T HAVE ONE THEN CUT WITH SCISSORS BY FOLLOWING DRAWN LINES. FOR THE ECOLOGY MINDED THIS IS A GREAT WAY TO RECYCLE WASTE PAPER AND CARDBOARD. IF YOU ARE NOT ECONOMY MINDED YOU CAN BUY CASES READY MADE. SEE LIST OF SUPPLIERS ON PAGE 44.

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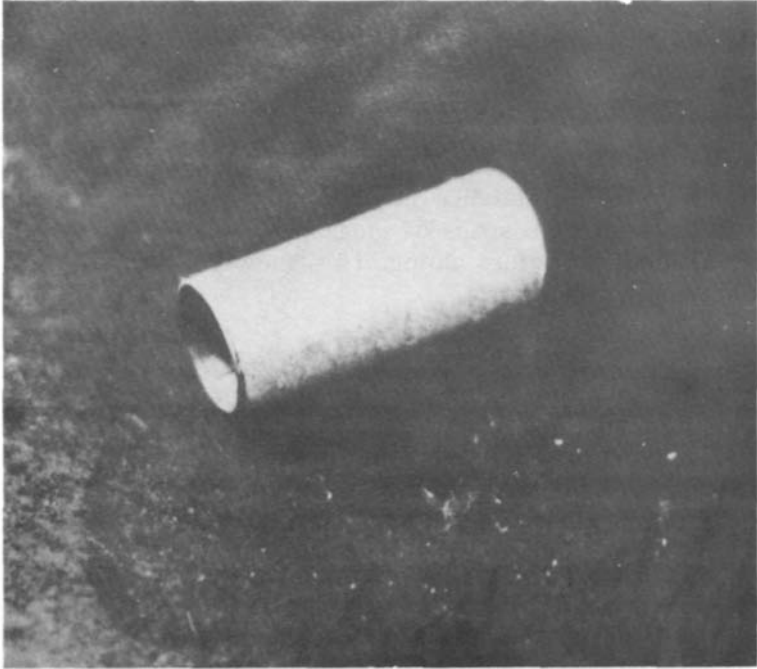
A STRIP OF CARDBOARD IS TIGHTLY ROLLED AROUND A FORMER.

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ELMER'S GLUE IS APPLIED TO THE LAST 1 INCH AND ROLLING IS COMPLETED.

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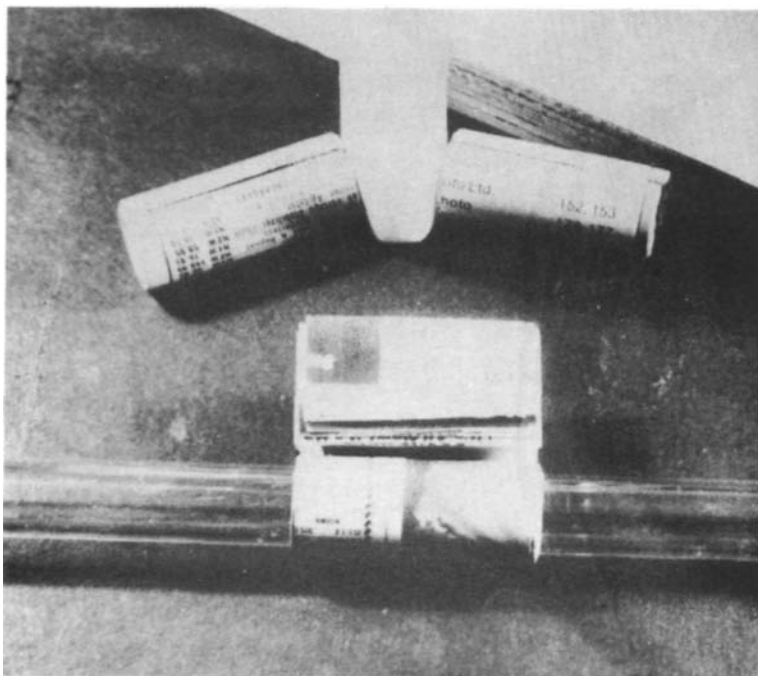
A FINISHED CASE

MAKING CASES FROM SCRAP PAPER

If you don't have a ready supply of scrap cardboard as previously mentioned you might wish to use scrap paper such as found in old magazines.

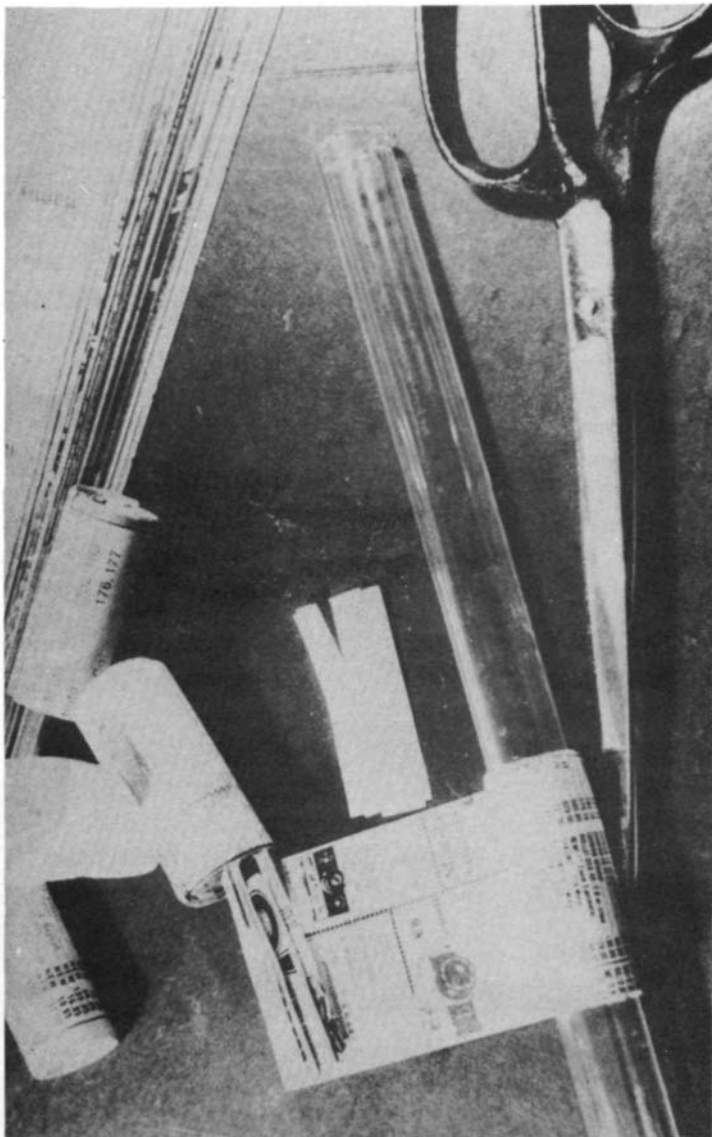
Cases are rolled the same as before only we use 5 or 6 sheets for more thickness. These strips are rolled until the proper O.D. is obtained.

The major difference now is, unlike when using cardboard, the 5 or 6 strips of magazine are folded under the last inch or so before gluing. This allows one glue joint to secure all 5 or 6 strips.



PROCEDURE IS SIMILAR TO CARDBOARD EXCEPT SEVERAL THICKNESSES ARE ROLLED AT ONE TIME AND END IS FOLDED UNDER BEFORE GLUE IS APPLIED AND FINAL ROLLING COMPLETED.

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EXCEPT FOR THE ENDS THE INDIVIDUAL SHEETS NEED NOT BE GLUED TOGETHER.

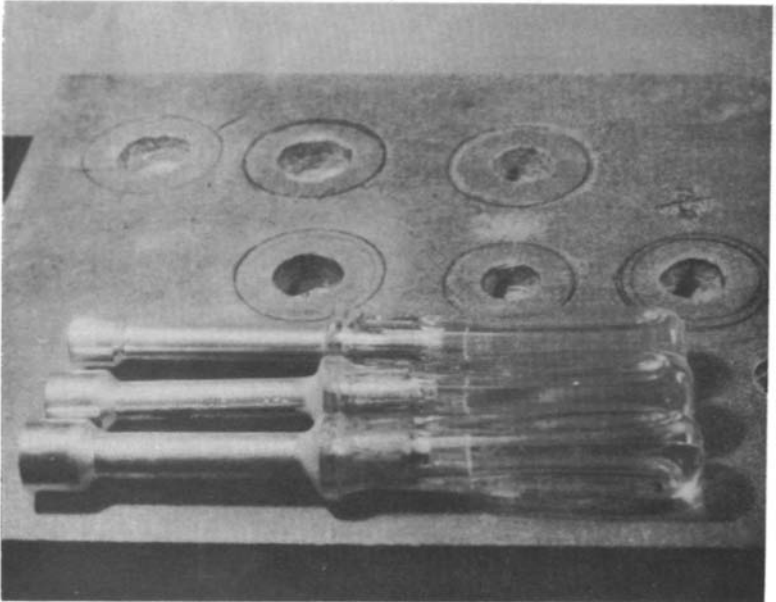
MAKING A DIE TO FORM END PLUGS

The die or tool that we are about to describe is made from wood. If available, a piece of hardwood such as maple could be used. However, for economy's sake you can use a small piece of 3/4 inch particle board.

If you or a friend have the facilities a set of punch and dies could be machined from metal.

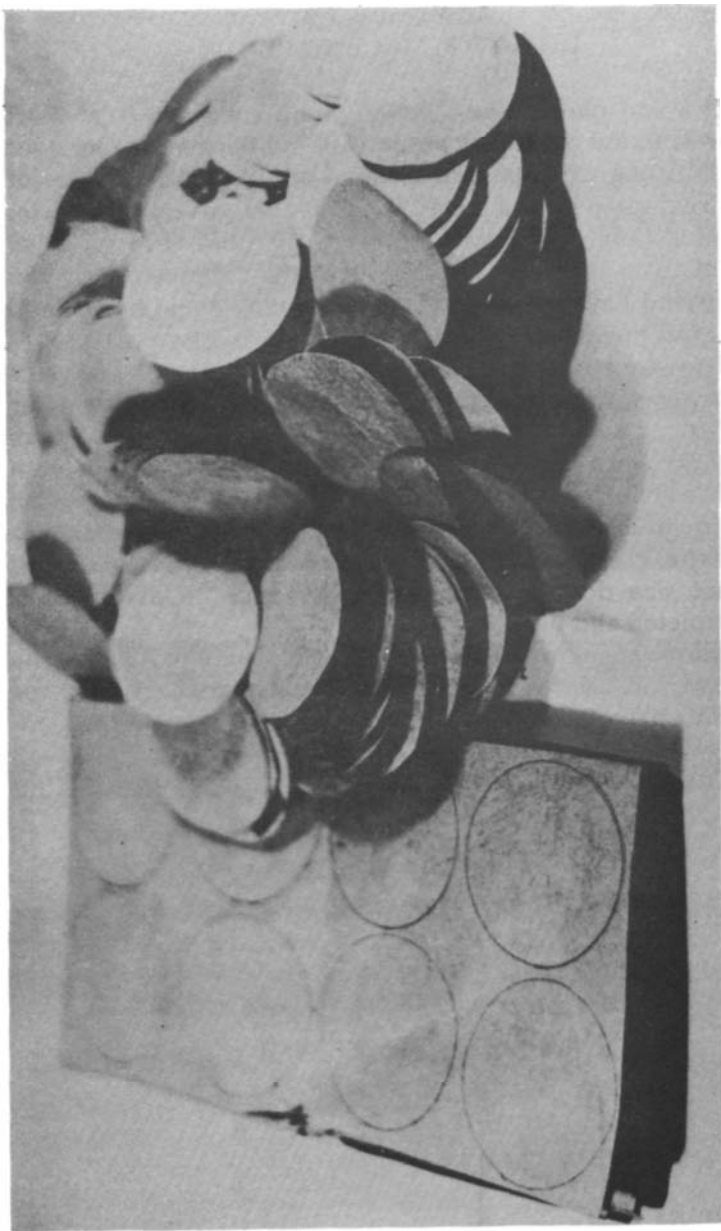
Since our end plugs will have to have an O.D. to match the I.D. of our casings that means the die to form the end plugs must have holes in it to correspond to these O.D.'s.

The punch diameter should be less than that of the hole by approximately 1/16 of an inch. You may use a nut driver of the right size or select a piece of wooden dowel. If a dowel is used both it and the hole can be "adjusted" with sandpaper if necessary.



NOTE: CIRCLES ARE DRAWN AROUND HOLES FOR EASE OF CENTERING PAPER DISCS.

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ORDINARY GROCERY SACKS ARE CUT INTO DISCS OF APPROPRIATE SIZE.

HOW TO MAKE END PLUGS

The end plugs shown in this book are made from kraft paper as found in grocery sacks. Cut and flatten the sacks out and by using a compass or a round template draw circles of the size desired on the paper. With scissors, cut out the circles one at a time or by stacking more than one sheet you can save time in cutting. Again, as with the forming die, if you or a friend have the facilities, hard tooling could be made to blank out the disks.

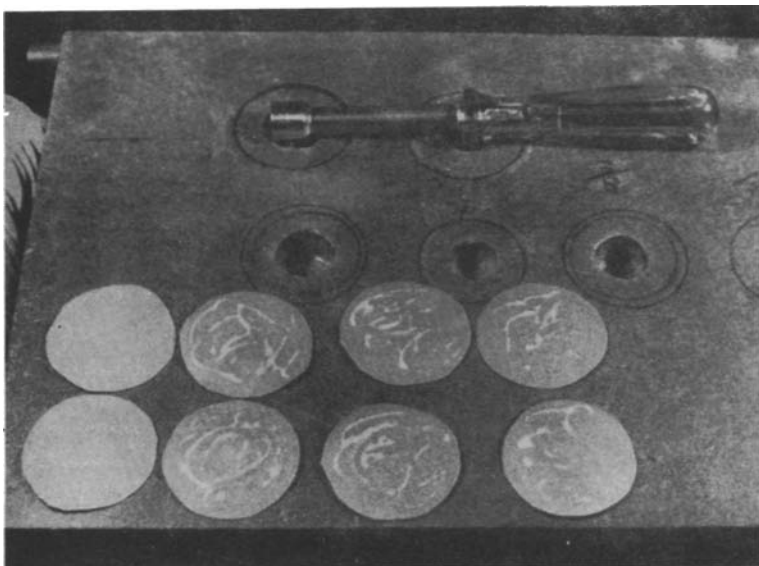
The fireworks described in this book use two sizes of Kraft paper discs — 1 1/4 in. diameter and 1 1/2 in. diameter

After a sufficient quantity of discs are cut out you are ready to form your end plugs. Glue 4 discs together with Elmer's glue, press flat and roll with a piece of large wooden dowel. Immediately place this on the die block, center over the correct hole and press in with a nut driver or correct size dowel. Remove and set aside to dry. This is a completed end plug.

Kraft paper discs 1 1/4 in. diameter are used for the Thunderbolt salutes and 1 1/2 in. diameter discs are used for the Super Thunderbolt Salutes and both sizes of Kraft Salutes (Cherry Bombs).

The O.D. (outside diameter) of end plugs used in this book are 3/8, 1/2, 5/8, 11/16 & 3/4.

PROFESSIONAL HOMEMADE SALUTES

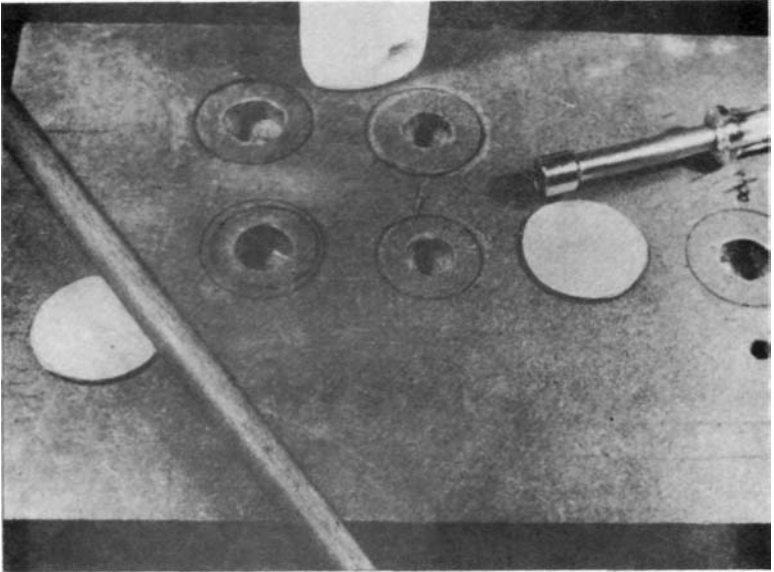


APPLY ELMER'S GLUE THUSLY.

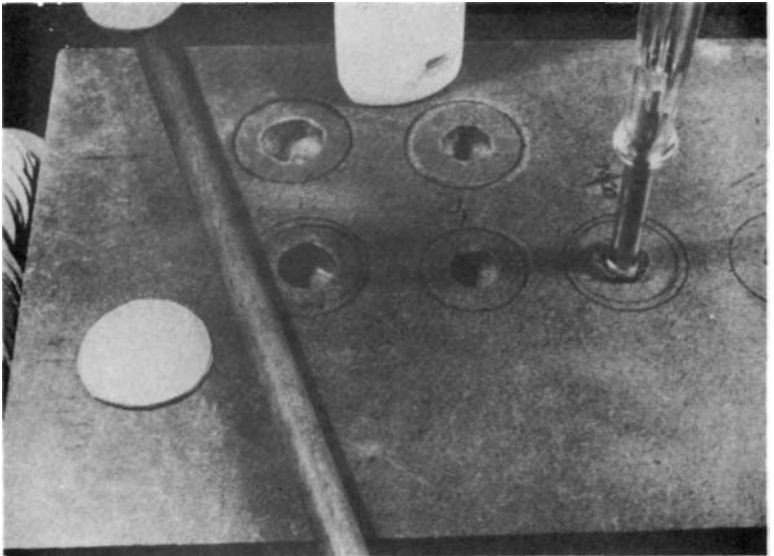


AND BUILD UP A SET OF FOUR DISCS.

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BEFORE THE GLUE SETS UP CENTER DISC AROUND THE
CORRECT DIE HOLE AND.....



PUSH INTO HOLE AS ABOVE.

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A PILE OF COMPLETED END PLUGS. AS WITH CASES
END PLUGS CAN, ALSO, BE PURCHASED READY MADE.

HOW TO MAKE SUPER THUNDERBOLT SALUTES

The case measurements for this one are 5/8 in, I.D. X 3/4 in. O.D. X 1 3/4 in. long.

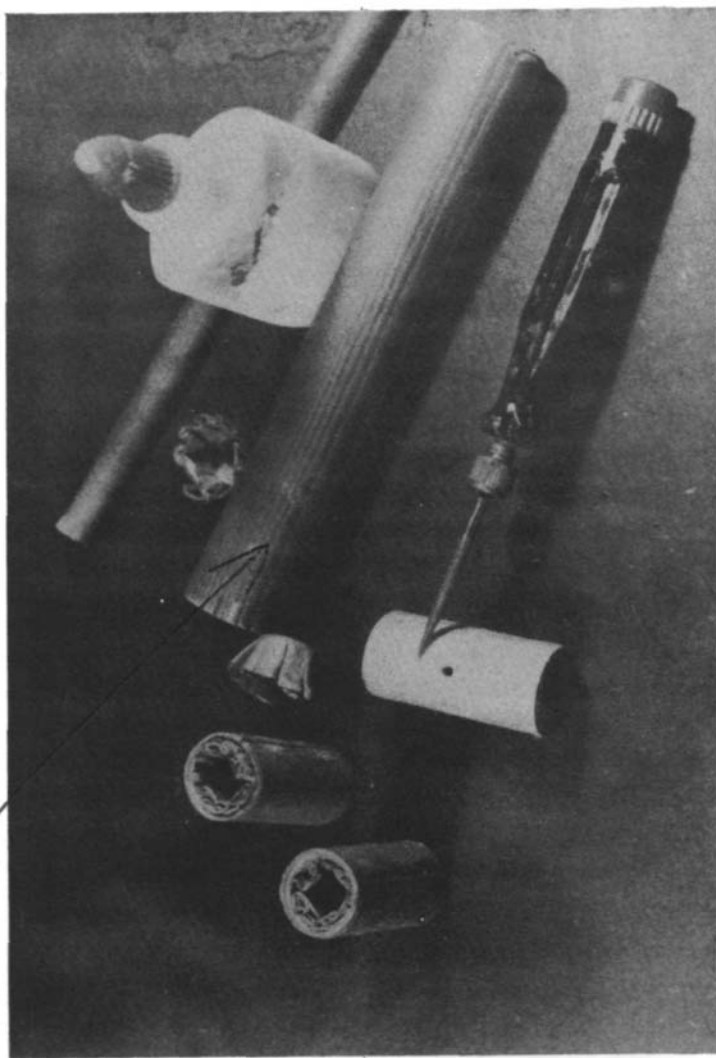
Select a previously prepared case this size. Apply adhesive to the O.D. of a 5/8 in. end plug and insert into one end of the casing. With an awl or a sharpened nail pierce a hole in the side of the casing to accept the fuse. Insert the fuse into the casing and secure with a dab of adhesive.

We now have a casing ready to be charged with powder. With a cardboard spoon carefully load the casing until it is about 1/3 full of powder. NOTE: Never fill the casing to the point where the remaining end plug will compress the powder when inserted fully.

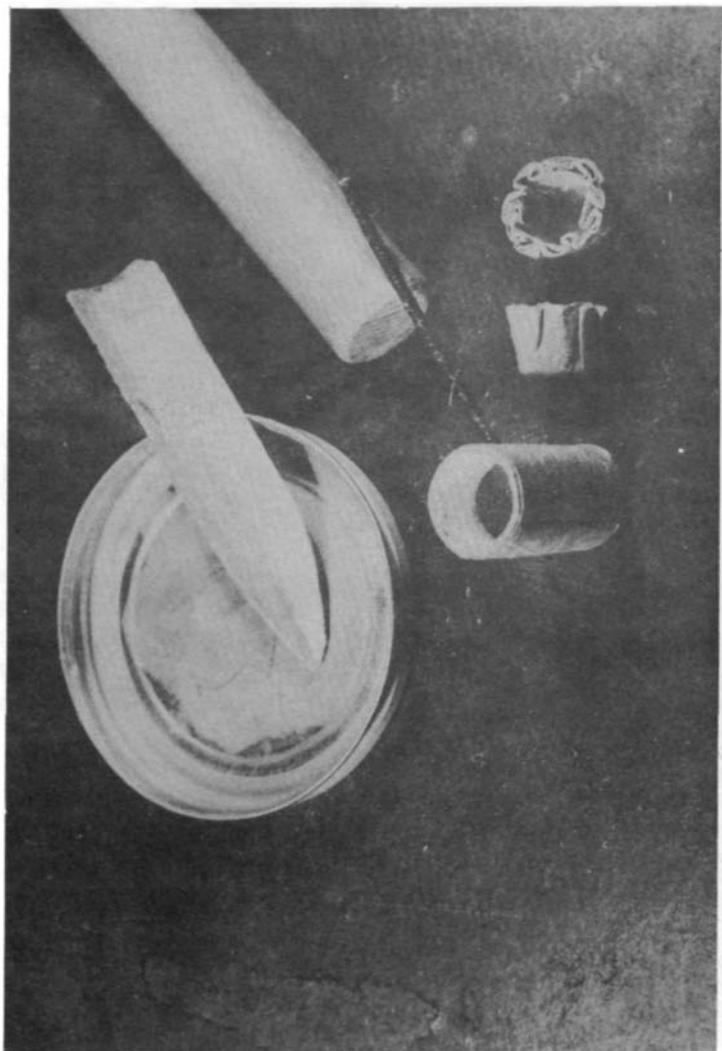
Apply adhesive to the O.D. of the remaining end plug and insert into the open end of the casing thus captivating the powder. Set the salute aside to dry.

The finished salute can have a decorative covering of aluminum foil or colored paper (such as gift wrapping paper) applied by cutting a 3 in. square piece, piercing a hole in the center to clear the fuse and applying adhesive to it. Pass this paper or foil over the fuse and form around the casing with your fingers. NOTE: This last step is for decoration only and can be bypassed if desired.

PROFESSIONAL HOMEMADE SALUTES

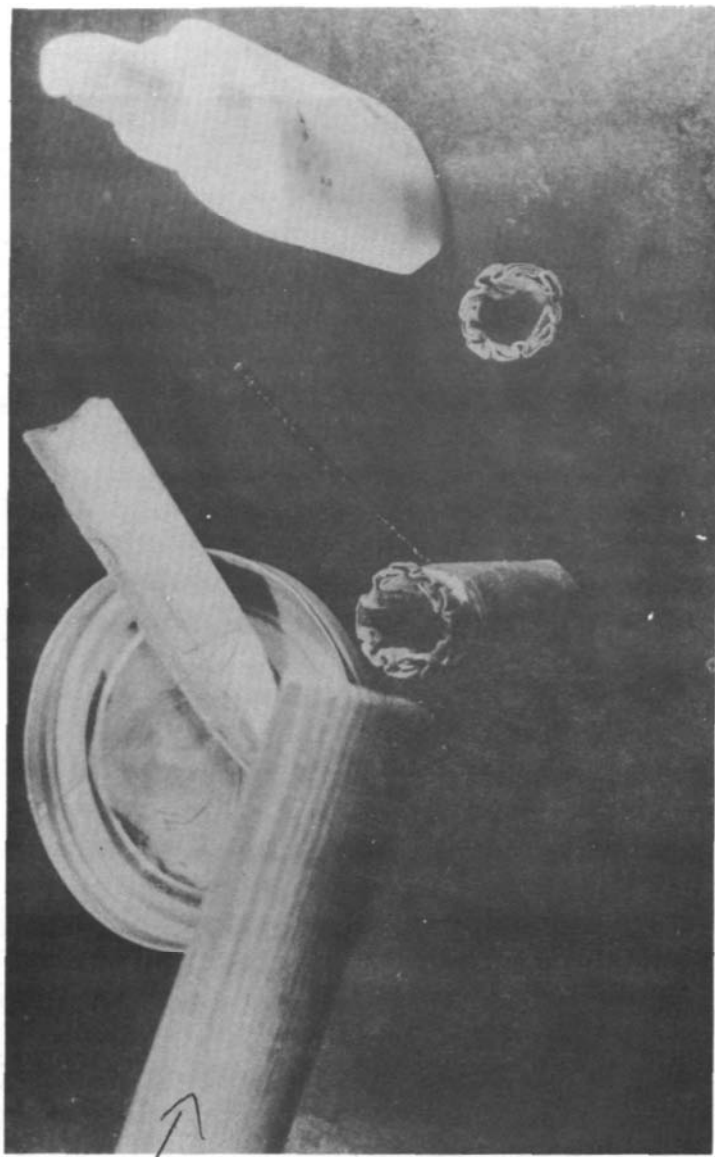


ONE END PLUG HAS BEEN GLUED IN PLACE AND FUSE HOLE PUNCHED IN SIDE OF CASE.



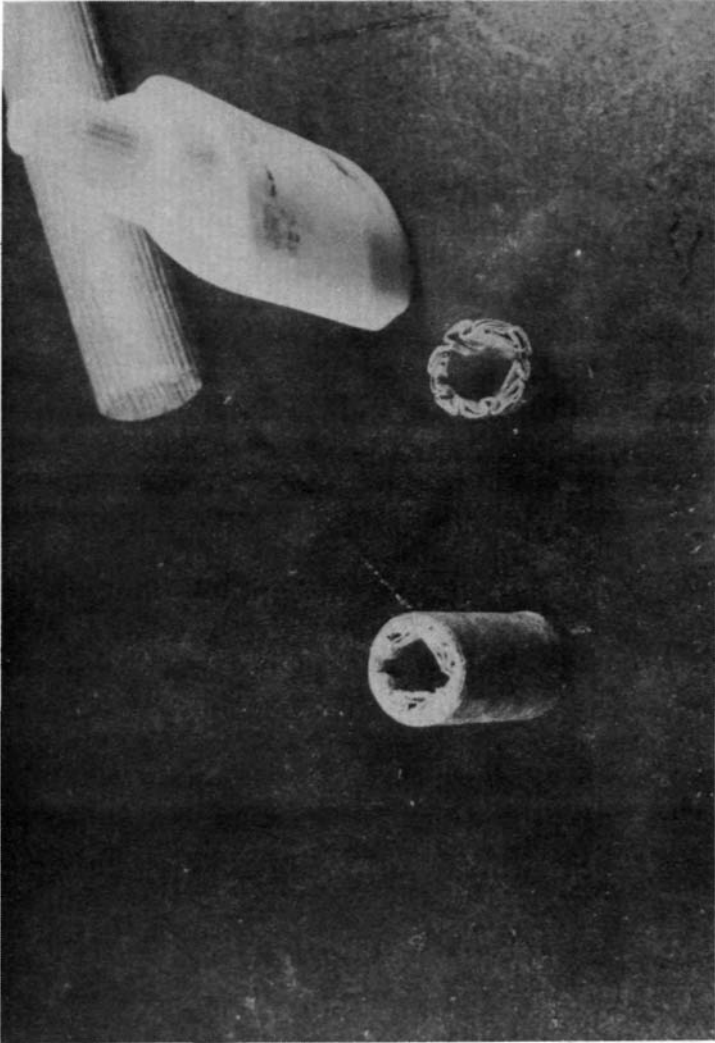
AFTER FUSE HAS BEEN SECURELY GLUED IN PLACE THE CASE IS READY TO BE FILLED WITH POWDER. READ PAGE 3 AGAIN!!!

PROFESSIONAL HOMEMADE SALUTES



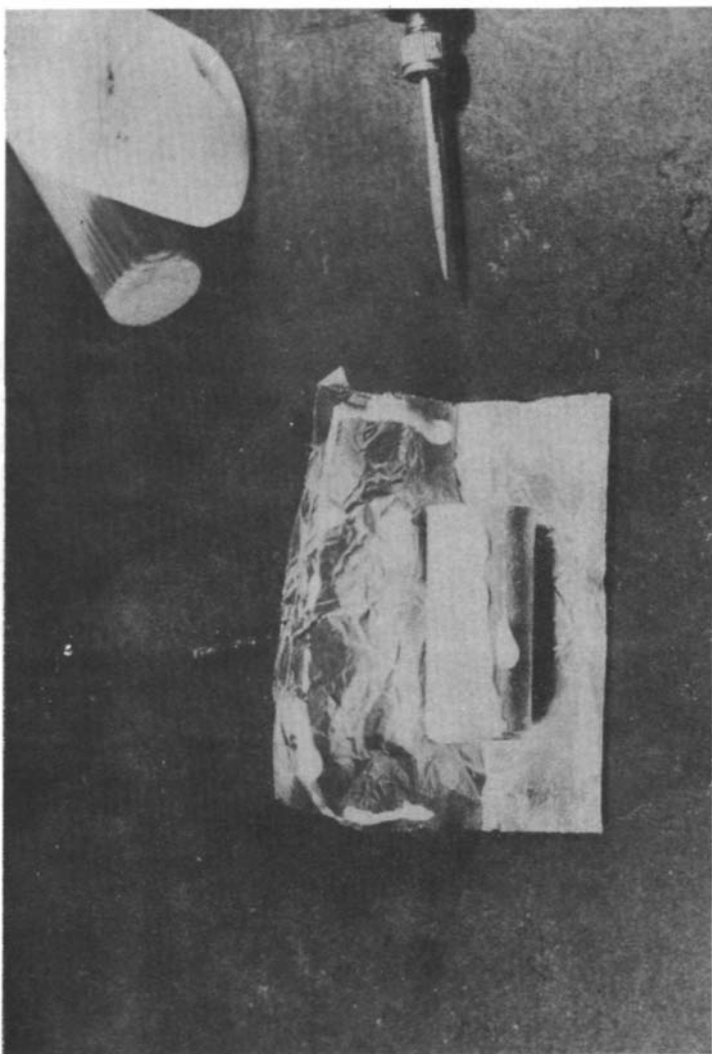
FINAL END PLUG IS NOW READY TO BE GLUED IN PLACE.

PROFESSIONAL HOMEMADE SALUTES



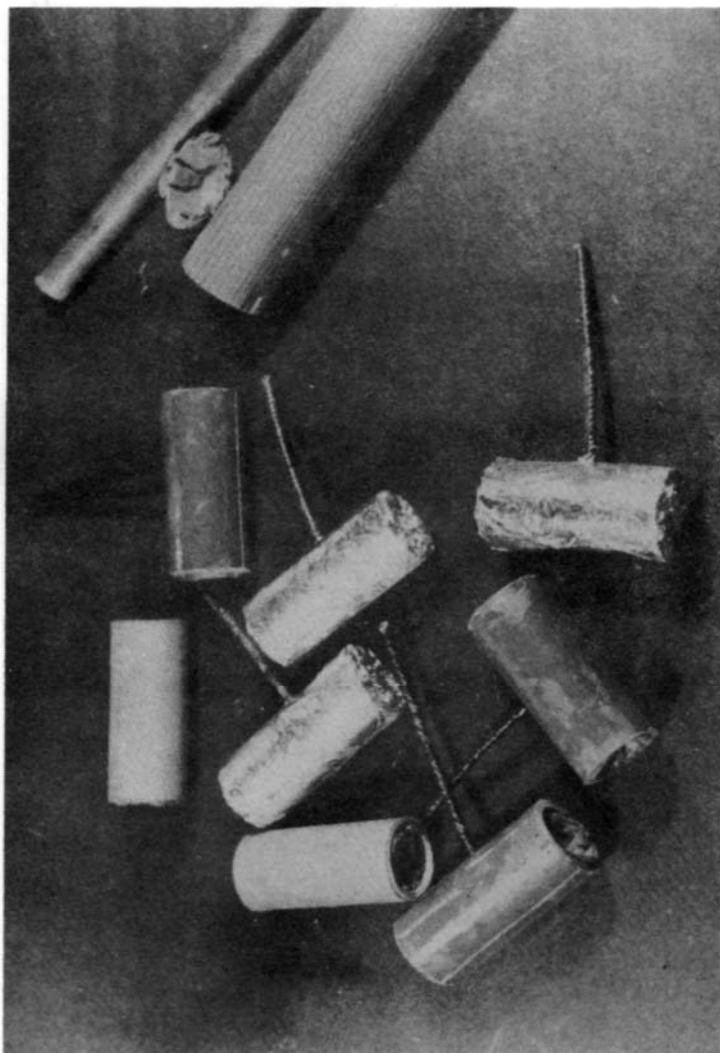
PUSH THE END PLUG FLUSH WITH THE CASE AND SET ASIDE TO DRY. THE SALUTE CAN BE USED "AS IS" OR COVERED WITH ALUMINUM FOIL OR OTHER DECORATIVE COVERING.

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ALUMINUM FOIL IS GLUED ON THIS SALUTE. BRIGHT COLORED WRAPPING PAPER COULD BE USED, ALSO.

PROFESSIONAL HOMEMADE SALUTES



SOME FINISHED SALUTES

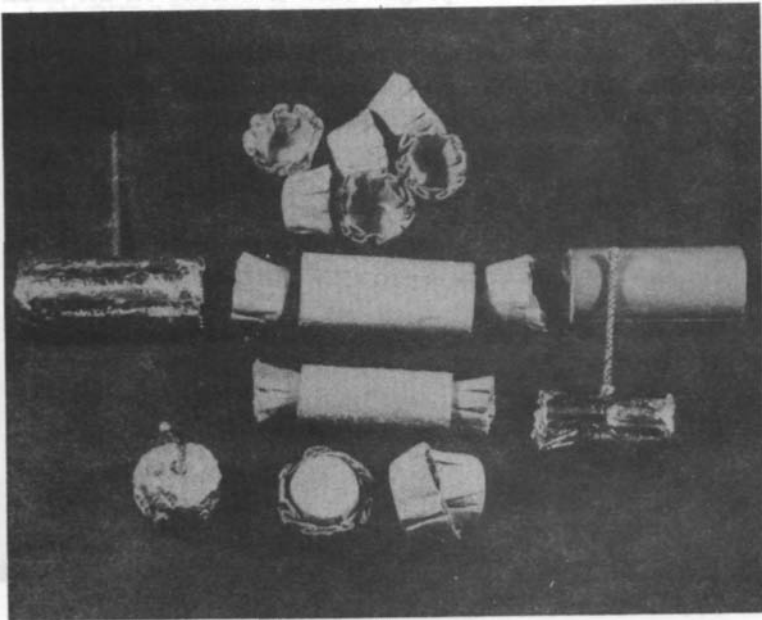
HOW TO MAKE THUNDERBOLT SALUTES

The case measurements for this one are 1/2 in. I.D. X 5/8 in. O.D. X 1 1/2 in. long. The end plugs used are 1/2 in. O. D.

Other than being physically smaller this salute is identical to its big brother the Super Thunderbolt Salute.

HOW TO MAKE MINIATURE SALUTES

The baby of the Thunderbolt family is this miniature whose casing measures 3/8 I.D. X 9/16 O.D. X 1 1/2 long and uses a 3/8 O.D. end plug. Other than its small size it is identical in construction to Thunderbolts.



SOME VARIOUS SIZE SALUTES

HOW TO MAKE KRAFT SALUTES

Better known through the years as "Cherry Bombs," these salutes didn't find the popularity among the homemade fireworks buffs as other types of fireworks. This may have been largely due to the case being difficult to make.

On the following pages we are going to show you how to make such casings by simply using two large end plugs. The O.D.'s of these two plugs should differ by 1/16 in. to allow one to telescope over the other.

For a regular size Kraft Salute use on 5/8 in O.D. and one 11/16 in. O.D. end plug. Filler the smaller one 1/3 full of powder. Apply adhesive to the inner lip of the larger end plug and place it down over the smaller one captivating the powder. With your fingers form the outer plug onto the inner one to better adhere them together. When dry punch a fuse hole in the smaller end plug. Punch it a little on the small side so that the fuse is held in rather snugly.

Push the fuse in until it touches bottom and secure it with a dab of glue where it enters. While this is drying prepare a 3 inch square piece of aluminum foil with a fuse clearing hole in the center.

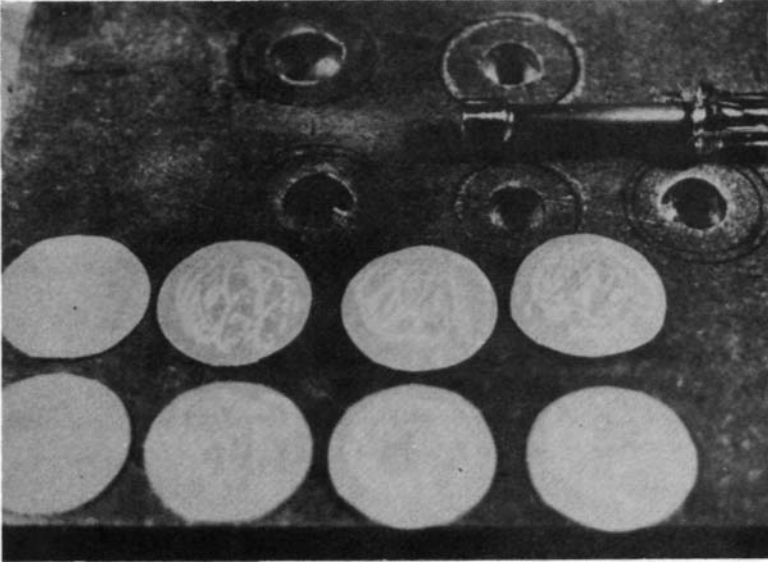
Holding the salute by the fuse dip the entire body into a container of Elmer's glue. Allow the excess to drip off then insert the fuse through the hole in the foil and form it around the casing with your fingers and set aside to dry.

HOW TO MAKE SUPER KRAFT SALUTES

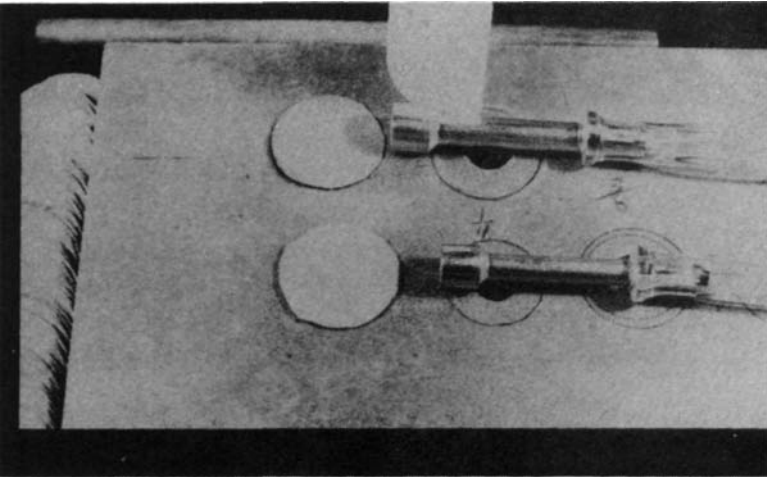
These larger size "Cherry Bombs" are identical to the regular size ones except an 11/16 in. O.D. is used as the smaller with a 3/4 in, O.D. end plug fitted over it. This larger case naturally holds more powder and produces a louder report.

The remaining construction procedure is the same as for the regular size one.

PROFESSIONAL HOMEMADE SALUTES

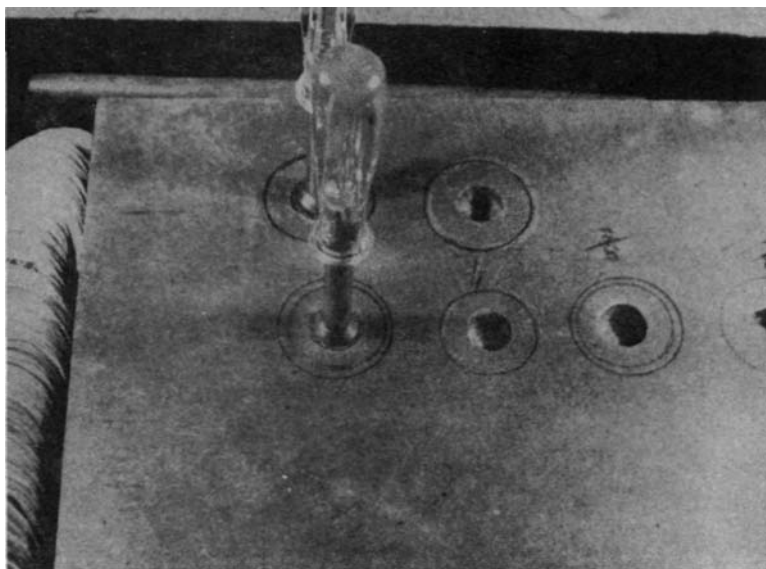


LAY OUT 2 DIFFERENT SIZE END PLUGS.

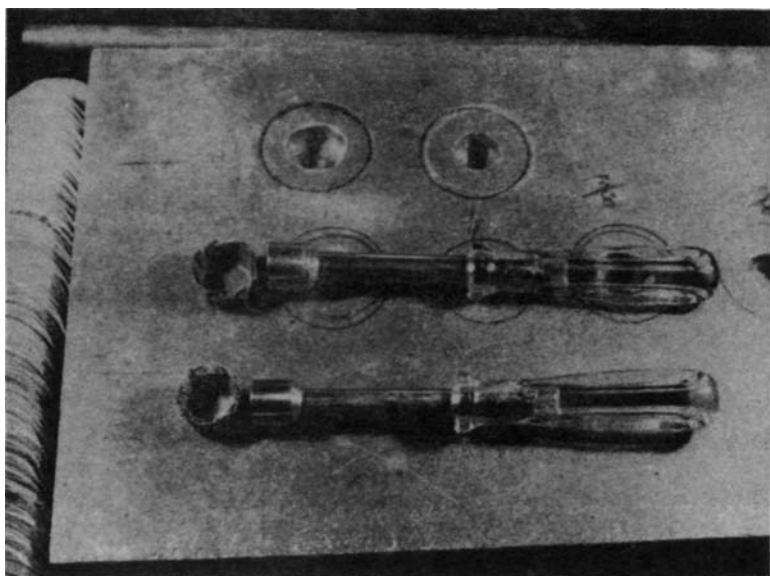


CONTINUE FORMING BEFORE GLUE SETS UP.

PROFESSIONAL HOMEMADE SALUTES

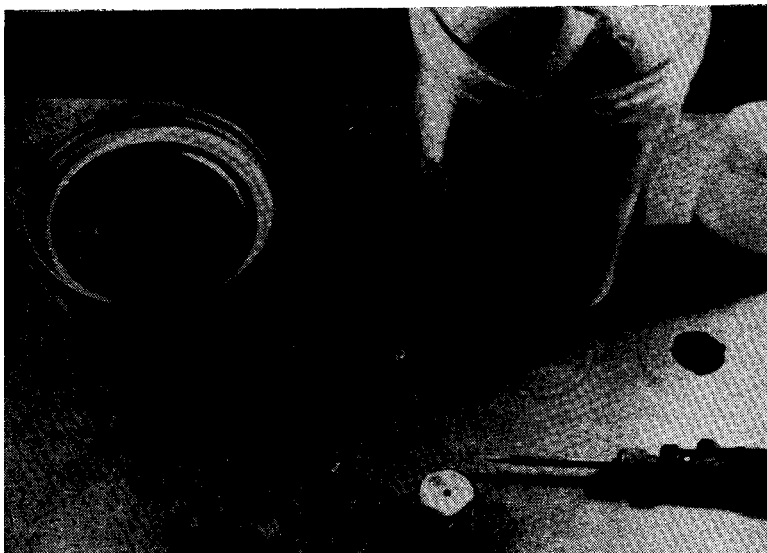


PUSH INTO 2 DIFFERENT SIZE DIE HOLES

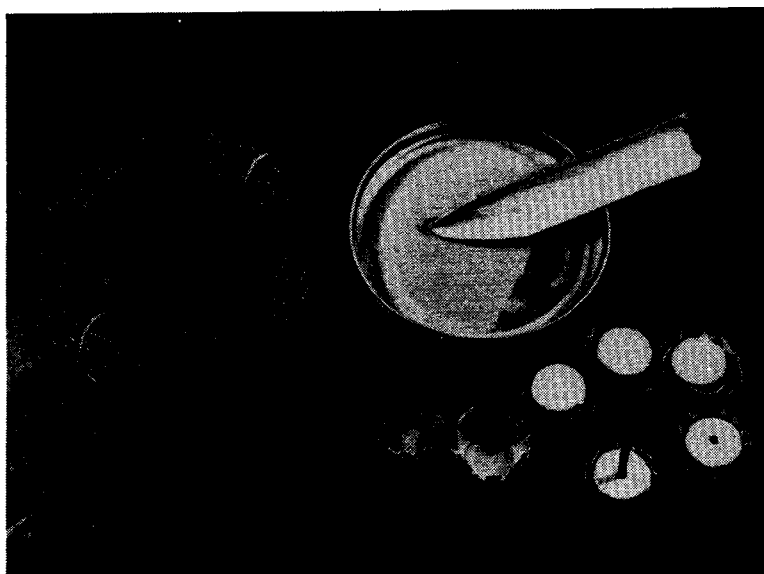


THUS FORMING 2 HALVES OF A "CHERRY BOMB."

PROFESSIONAL HOMEMADE SALUTES



FUSE HOLE IS PUNCHED IN ONE HALF



.....THE OTHER IS CHARGED WITH POWDER AND THE TWO HALVES ARE GLUED TOGETHER.

HOW TO MAKE STICK SALUTES

These are large, conventional looking fireworks with the fuse sticking out the end rather than the side as with the Thunderbolt Salutes.

The casings for these Stick Salutes can be either 1/4 or 3/8 in. I.D. Both are 1 inch O.D. The length can vary from 2 to 6 inches. DO NOT make them any longer than 6 inches as this large size can be very DANGEROUS!

The ends of the 3/8 I.D. case can be closed by two methods: Crimping or by using 3/8 O.D. end plugs.

Crimping is accomplished by pushing the inside of the end in with a screwdriver and then applying a generous amount of glue.

Using a paper funnel the case is now filled with powder to within 1/2 inch of the other end. A fuse is installed and this end is also crimped in around the fuse and finally secured with a generous application of glue.

Crimping and filling for the 1/4 in. I.D. cases uses the same procedure as just mentioned.

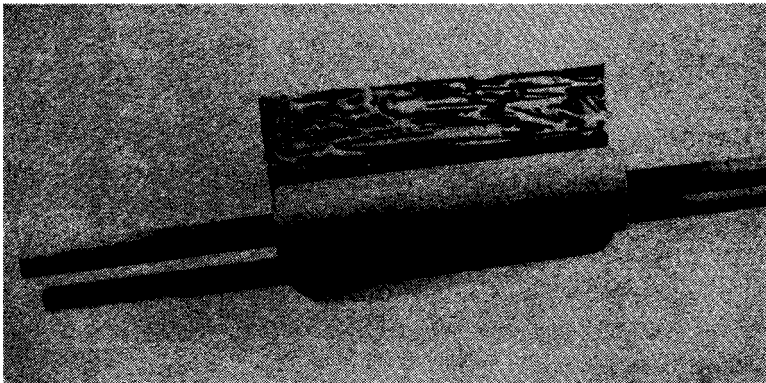
Closing by using end plugs is very similar to the procedure used on the Thunderbolt Salutes. A 3/8 O.D. end plug is inserted with glue applied to its exterior, pressed flush and allowed to dry. The powder is now loaded as before. The remaining end plug has a fuse hole pierced in it with the awl and a length of fuse is inserted through this hole so that it will protrude internally about 1 inch. This end plug is now inserted with its exterior coated with glue into the casing and pressed flush. Now apply a dab of glue to where the fuse passes through the end plug to secure it. A poorly fitted fuse here can cause a weak report or misfire.

The appearance of these stick salutes can be enhanced by gluing a piece of aluminum foil or colored paper to the outside diameter if you desire.

PROFESSIONAL HOMEMADE SALUTES

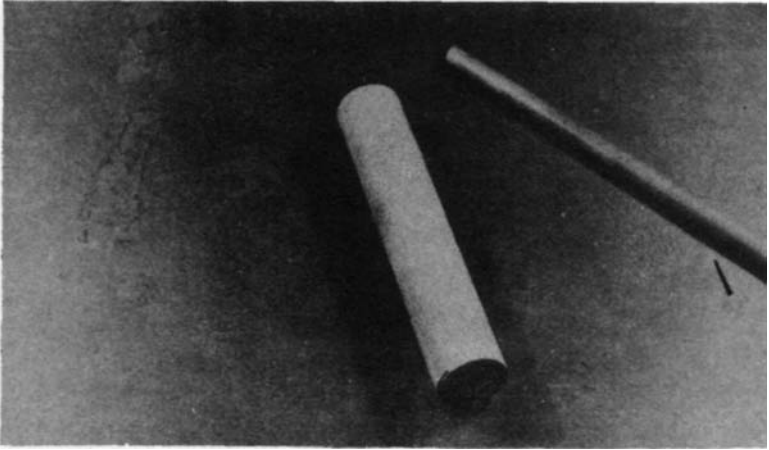


STICK SALUTE CASES ARE MADE THE SAME WAY AS BEFORE ONLY THEY USUALLY HAVE A SMALLER INSIDE DIAMETER AND ARE LONGER.

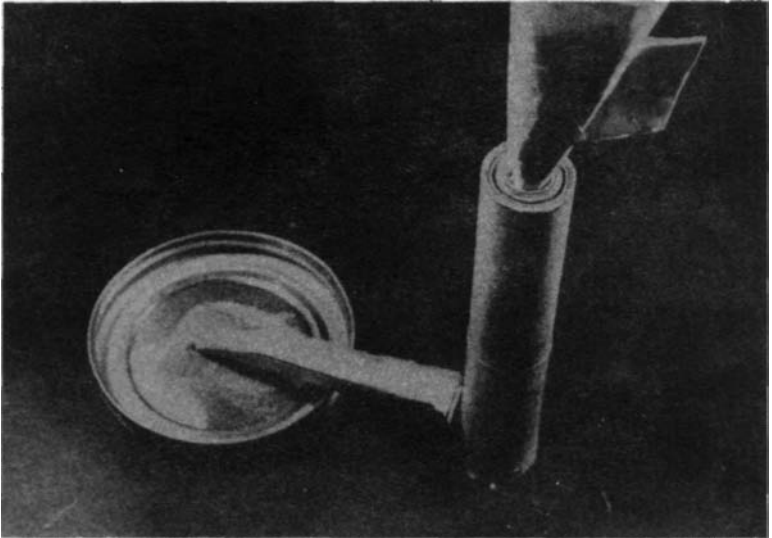


GLUE IS APPLIED TO THE FINAL 1 INCH

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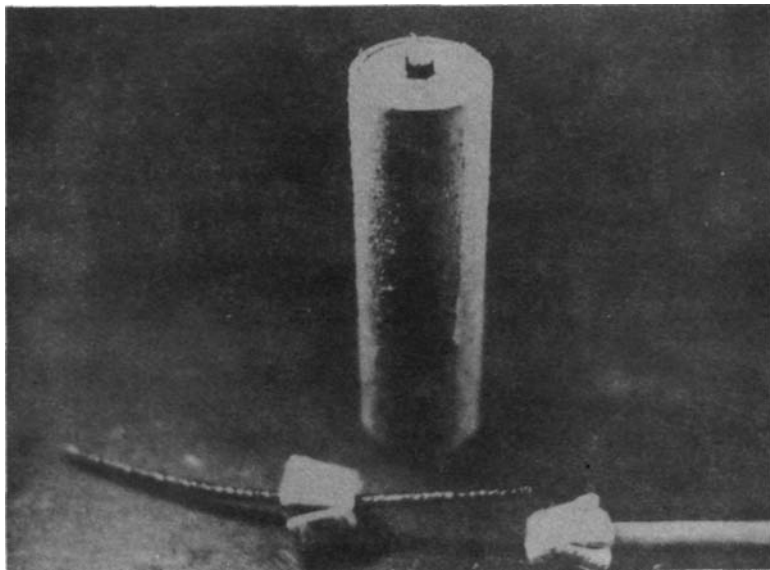


A FINISHED STICK SALUTE CASE

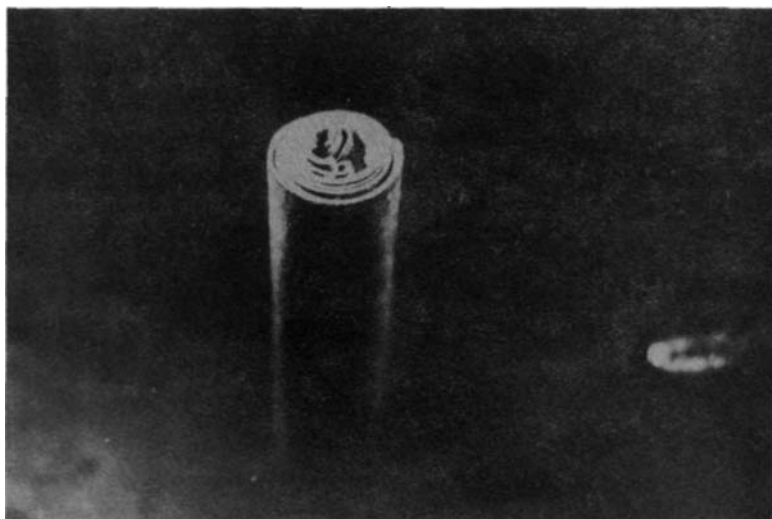


**A SMALL PAPER FUNNEL IS USED TO FILL WITH POWDER.
READ PAGE 3 AGAIN!!!**

PROFESSIONAL HOMEMADE SALUTES

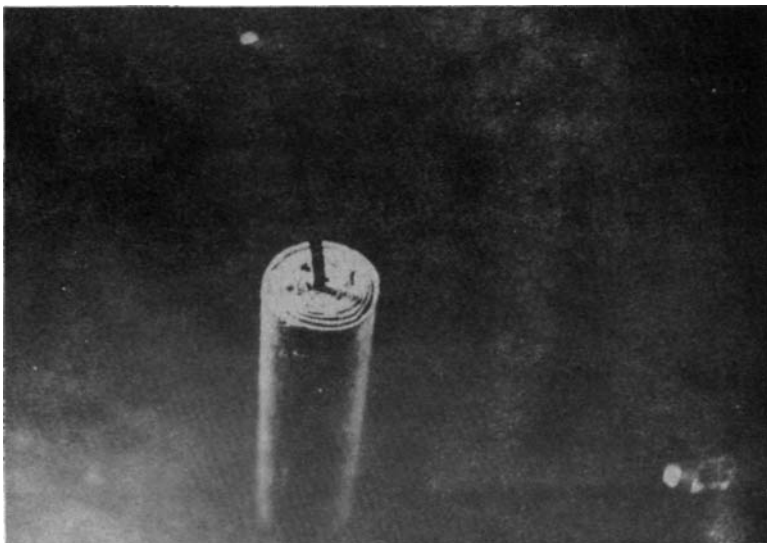


CASES CAN BE CLOSED TWO WAYS. ABOVE: REGULAR END PLUGS ARE USED WITH THE FUSE INSERTED THRU ONE OF THEM.

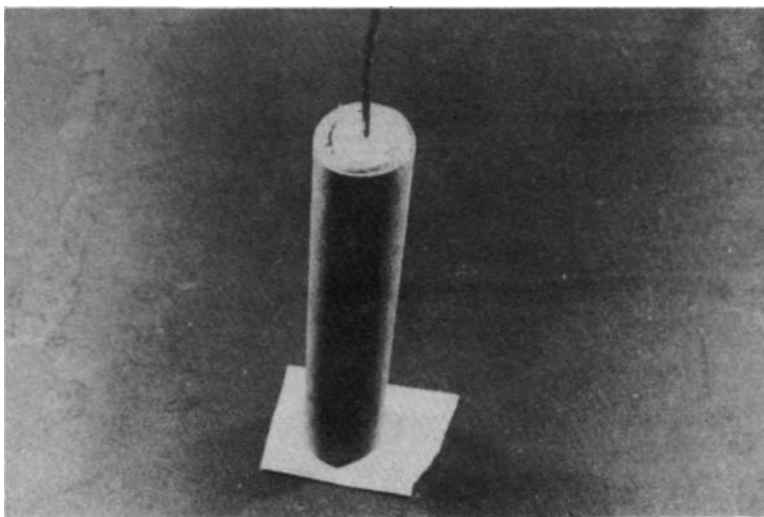


ABOVE: THE CASE IS CLOSED BY INTERNAL CRIMPING AND GLUING.

PROFESSIONAL HOMEMADE SALUTES

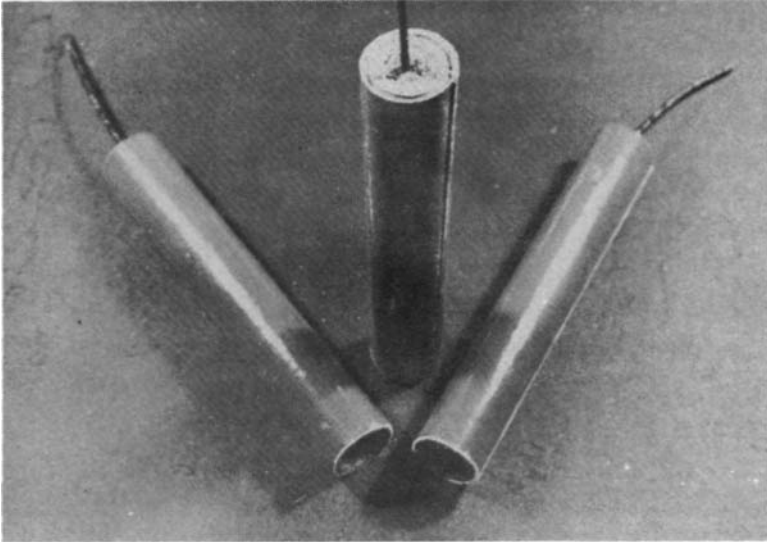


ABOVE: THE FUSE IS INSERTED INTO THE CASE THEN THE CASE IS CRIMPED IN AROUND IT.

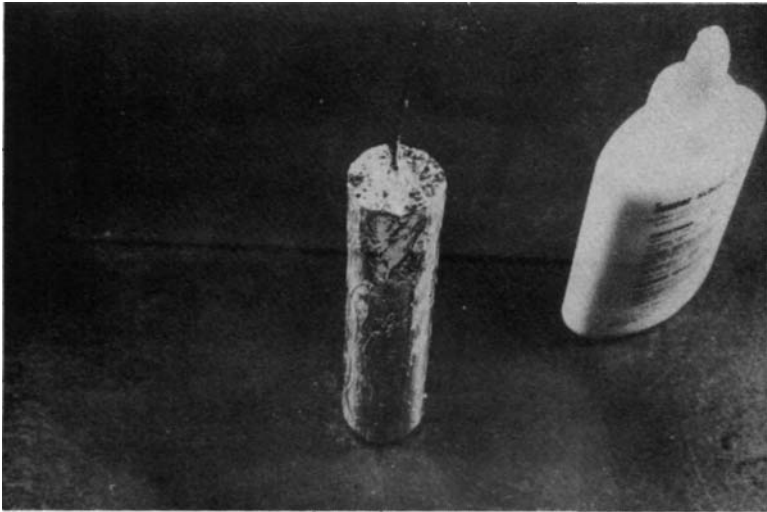


AND A GENEROUS AMOUNT OF GLUE APPLIED.

PROFESSIONAL HOMEMADE SALUTES

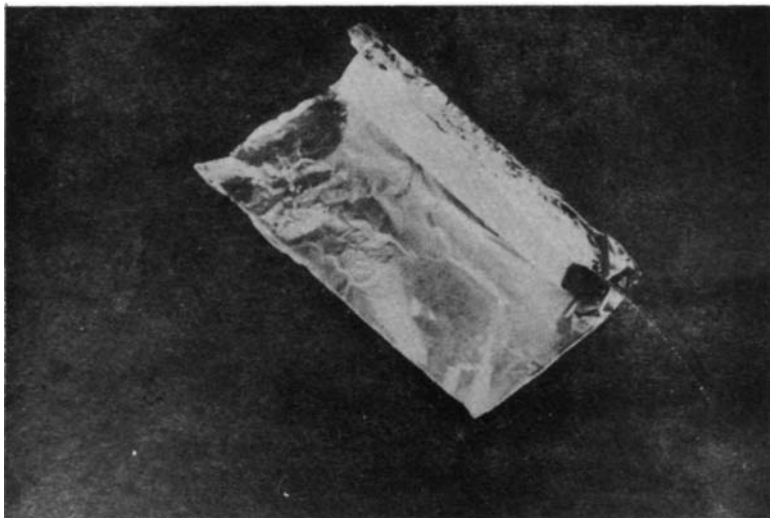


AS WITH REGULAR SALUTES STICK SALUTES CAN BE DECORATED WITH PAINT OR

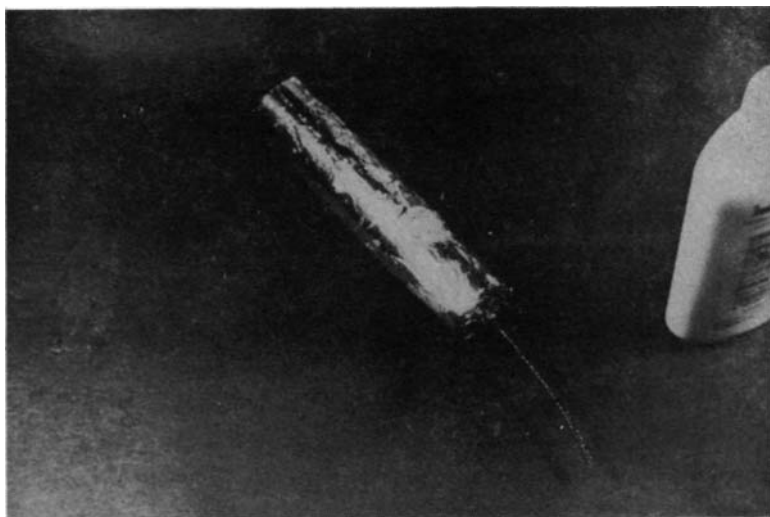


ALUMINUM FOIL.

PROFESSIONAL HOMEMADE SALUTES



ABOVE AND BELOW: A STICK SALUTE IS BEING DRESSED UP WITH A COVERING OF ALUMINUM FOIL.



PROFESSIONAL HOMEMADE SALUTES

LIST OF SUPPLIES NEEDED

1. Compass or templates to draw circles for end plugs (11/4 & 11/2 inch diameter).
2. One foot lengths of wooden dowels in the following diameters: 1/4, 3/8, 1/2, 9/16 and 5/8.
3. Elmer's Glue.
4. One foot square piece of 3/4 in. particle board (to make die for end plugs).
5. Six inch length of broom handle or large wooden dowel (used to press in end plugs).
6. Paper spoons and funnel for loading powder (make from scrap materials).
7. Aluminum foil and colored paper (for decorative outer cover).
8. Ruler, pencil and scissors.
9. Screwdriver (small to medium size).
10. Seven piece set of nut drivers (3/16 to 1/2).
11. Fine strainer (kitchen variety as shown in photographs on pages 4 and 6.
12. Measuring cup,
13. Scales to weigh powder ingredients (small postage scales).
14. Awl for piercing fuse holes in casings.
15. Wire cutter for cutting fuse.
16. Scrap cardboard (cereal boxes, etc.) and grocery sacks for end plugs.
17. Ingredients for powder (potassium chlorate, pyro aluminum [400 mesh] and sulfur flour).
18. Fuse (3/32 dia. controlled, waterproof).

PROFESSIONAL HOMEMADE SALUTES

LIST OF SUPPLIERS

THE CHEMICAL SHED

944 E. Baseline
San Bernardino, California 92410
Catalog \$2.00

HAGENOW LABORATORIES

1302 Washington Street
Manitowic, Wisconsin 54220
Catalog \$1.00

MERRILL SCIENTIFIC

1665 Buffalo Road
Rochester, New York 14624
Catalog \$2.00

RICHARD O. WOLTER

326 Summit Court
Schaumburg, Illinois 60193
Catalog \$1.00

WESTECH CORPORATION

P.O. Box 593
Logan, Utah 84321
Catalog \$2.00

